

MONOGRAPH

THE PREVENTION OF SUBSTANCE USE, RISK AND HARM IN AUSTRALIA

a review of the evidence



The National Drug Research Institute and the Centre for Adolescent Health

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ABBREVIATED TERMS

AA	Alcoholics Anonymous	CPI	Community Partnerships Initiative
ABCI	Australian Bureau of Criminal Intelligence	CTP	Community Trials Project
ABS	Australian Bureau of Statistics	DAMEC	Drug and Alcohol Multicultural Education Centre
ACS	Australian Customs Service	DARE	Drug Abuse Resistance Education
ADCA	Alcohol and Other Drugs Council of Australia	DOFA	Department of Finance and Administration
ADHD	Attention Deficit Hyperactivity Disorder	DPP	Director of Public Prosecutions
ADIA	Australian Drug Intelligence Assessment	DUCO	Drug Use Careers of Offenders
AFP	Australian Federal Police	DUMA	Drug Use Monitoring in Australia
AIDR	Australian Illicit Drug Report	EAP	Employee assistance program
AIHW	Australian Institute of Health and Welfare	ETS	Environmental tobacco smoke
ALRC	Australian Law Reform Commission	FAS	Foetal alcohol syndrome
AMPS	Alcohol Misuse Prevention Study	FAST	Families and Schools Together
ANAO	Australian National Audit Office	FEI	Family Empowerment Intervention
ANCD	Australian National Council on Drugs	FFT	Functional Family Therapy
ARISIT	Action Research Intervention and System Improvement Team	GBL	Gamma butyrolactone
ATP	Australian Temperament Project	GHB	Gamma hydroxybutyrate
ATS	Amphetamine-type stimulants	GSAP	Good Sports Accreditation Program
AUSTRAC	Australian Transaction Reports and Analysis Centre	HIC	Health Insurance Council
BBV	Blood-borne virus	HSPP	Hutchinson Smoking Prevention Project
BCR	Benefit-cost ratio	IDEP	Illawarra Drug Education Program
BEST	Behavioural Exchange Systems Training	IDRS	Illicit Drug Reporting System
CALD	Culturally and linguistically diverse	IDU	Injecting drug user
CAP	Community Action Project	IGCD	Intergovernmental Committee on Drugs
CAR	Children at Risk	ISFP	Iowa Strengthening Family Program
CBA	Cost-benefit analysis	JAG	Joint Advisory Group
CEA	Cost-effectiveness analysis	KAV	Knowledge, attitude and values
COAG	Council of Australian Governments	LECP	Law Enforcement Cooperation Program
COMPARI	Community Mobilisation for the Prevention of Alcohol-Related Injury	LIFT	Linking the Interests of Families and Teachers
		LSD	Lysergic acid diethylamide
		LST	Life Skills Training

MCDS	Ministerial Council on Drug Strategy	POC	Proceeds of Crime
MDMA	Methylenedioxyamphetamine	PYLL	Person Years of Life Lost
MMT	Methadone maintenance therapy	RBT	Random breath testing
MSIC	Medically supervised injecting centre	RCT	Randomised controlled trial
MSO	Most serious offence	ROI	Return on investment
MST	Multisystemic Treatment	RSAP	Residential Student Assistance Program
NAIP	National Alcohol Indicators Project	SES	Socioeconomic status
NDRI	National Drug Research Institute	SHAHRP	School Health and Alcohol Harm Reduction Project
NDS	National Drug Strategy	SIDS	Sudden Infant Death Syndrome
NDSHS	National Drug Strategy Household Survey	SNAP	Smoking Nutrition Alcohol and Physical Activity
NESB	Non-English speaking background	SSDP	Seattle Social Development Project
NHMRC	National Health and Medical Research Council	TAC	Transport Accident Commission
NHPA	National Health Priority Area	TAFMI	Targeted Adolescent/Family Multisystems Intervention
NHSP	National Heroin Signature Program	TC	Therapeutic Community
NIDC	National Illicit Drugs Campaign	TOPS	Treatment Outcome Prospective Study
NIDS	National Illicit Drugs Strategy	UATSIPS	Urban Aboriginal and Torres Strait Islander Peoples Supplement
NRT	Nicotine replacement therapy	UN	United Nations
NSSDS	National Secondary School Drug Survey	UNDCP	United Nations Drug Control Programme
NSMHWB	National Survey of Mental Health and Well-being	VAHC	Victorian Adolescent Health Cohort
NSP	Needle and syringe programs	WHO	World Health Organization
NTC	National Tobacco Campaign	ZTP	Zero Tolerance Policy
OMCG	Outlaw motorcycle gangs		
OTC	Over-the-counter		
PACE	Parenting Adolescents a Creative Experience		
PATHS	Promoting Alternative Thinking Strategies		
PDFY	Preparing for the Drug Free Years		
PED	Performance and Image Enhancing Drugs		
PMA	Paramethoxyamphetamine		

EXECUTIVE SUMMARY

This Monograph has trawled a vast sea of information relevant to drug use, risk and harm in the Australian community, to capture the essential wisdom that can guide the national prevention agenda. The document has been prepared to provide an evidence base for a comprehensive national prevention agenda to be implemented along with synergistic actions across multiple government departments and sectors of society. Prevention refers to measures that prevent or delay the onset of drug use as well as measures that protect against risk and reduce harm associated with drug supply and use. The Monograph encompasses the full spectrum of prevention intervention measures; evaluated Australian approaches to the prevention of drug supply, use, and harm; approaches to prevent or delay the uptake of licit and illicit drugs by children and young people; current application of prevention policy and strategy in Australia; and gaps in prevention knowledge and effort.

To undertake this task, we have identified the major patterns of use, risk and harm accruing to drug use in Australia using the most contemporary data; overviewed the social and structural determinants of health and drug use, internationally and in Australia, with a particular concern for Indigenous Australians; reviewed the literature on risk and protective factors relating to drug use and other psychosocial problems; reviewed the literature relating to the evidence for a range of prevention strategies, both in Australia and internationally; included every drug type identified by the National Drug Strategy (NDS); where possible, distinguished between different age groups, from conception to old age; and considered the implications of these findings.

Our major conclusion is that an integrative policy framework, which we refer to as a Protection and Risk Reduction Approach to Prevention, should be adopted. This approach integrates knowledge of developmental processes throughout the life-course, with knowledge of broader macro-social influences on behaviour and health outcomes. The Protection and Risk Reduction Approach emphasises the importance of reducing the known developmental risk factors that lead children and young people to become involved with risky drug use and harm, while also enhancing protective factors. While there is evidence that interventions in the early years make a difference later in life, it is also the case that

risk factors for harmful drug use arise in childhood, adolescence and later in life and reductions to drug-related harm may be limited if prevention investment were to exclude risks emerging at other life stages. The framework also acknowledges that targeted, early intervention strategies focused on strengthening protective factors will be useful for children and youth with a high number of developmental risk factors. The approach also emphasises brief interventions, treatment and harm reduction strategies, acknowledging that such strategies can reduce drug-related harm for drug users who have a high number of risk factors, while also improving developmental opportunities for children. Law enforcement is an essential element of this approach to prevention not just in controlling the supply of drugs, but also in influencing community values about drug use, diverting early offenders and acting to protect the community from crime and social disorder.

Central to the thesis of this review is that a comprehensive Prevention Agenda needs to be guided by a shared understanding of the nature of the harms to be prevented and, correspondingly, of the underlying patterns of risky drug use. The concept of 'risk' has been expanded to include more distal risk factors, including social and demographic factors as well as early developmental risk (and protection) factors. The first substantive part of the review overviews current information about the nature and prevalence of the most serious harms associated with different patterns of use of different substances.

Other models that have informed the work include the Public Health Systems model, which illustrates the levels of increasing breadth and complexity at which prevention activities can be focused, from work with individuals to national and international approaches. This model also conceptualises determinants of health and drug use on a continuum from macro to micro: social and structural determinants are distal influences; risk and protection factors are more proximal. The model is both top-down and bottom-up: the macro clearly influences the micro, but equally clearly the micro influences the macro. Activity at any one of the levels can influence not only that level but, indirectly, all other levels. This approach allows the mapping of systems, pathways and strategies that connect among and between risk factors, protective factors and drug use outcomes.

To better organise the systems approach to prevention, we have emphasised the local community as one of the primary levels for integrating and coordinating planning within a Protection and Risk Reduction Approach to Prevention. An emphasis on the local community offers prospects for addressing some of the broad social determinants related to both social disadvantage and disconnection that underlie aspects of drug-related harm. A structured approach to local community organisation also offers a promising method for the coordinated application of evidence-based prevention strategies aimed at the reduction of developmental risk factors and enhancement of protective factors. By emphasising the community level, the implications of the systems model for a coordinated approach to prevention across different jurisdictions become clearer.

The review found that tobacco is the leading cause of premature death and hospitalisation among all Australians. However, alcohol causes the deaths and hospitalisation of slightly more children and young people than do all the illicit drugs combined, and many more than does tobacco. There are likely future health costs associated with current drug use, including the costs of hepatitis C among injecting drug users in Australia. There are also known to be a range of social harms impacting on individual users of illicit drugs who receive criminal convictions.

The main features of risky drug use patterns in Australia follow.

- There has been a dramatic reduction in levels of smoking in Australia in recent decades, but smoking rates by young people and young women in particular have been less resistant to change and are a concern for future levels of tobacco-caused mortality and morbidity.
- Alcohol consumption in Australia has recently increased slightly overall and more markedly among young people. Two-thirds of Person Years of Life Lost through risky alcohol use are due, at least partly, to the short-term or acute effects from alcohol intoxication.
- Cannabis is the most widely used illicit drug in Australia, though its use may have declined very recently. Around 10% of people become regular heavy users of cannabis and risk long-term health consequences and dependence. Cannabis use during adolescence is associated with later mental health and conduct problems, though the causal processes remain unclear.

- Injection is the main risk behaviour in relation to health-related harms from other illicit drug use. The 2001 National Drug Strategy Household Survey (NDSHS) indicated that less than 2% of the adult population reported injecting illicit drugs at some time in the last 12 months. Injection is associated with the risk of dependence, opiate overdose and the transmission of blood-borne viruses (BBV).
- Heavy 'binges' on amphetamine-type drugs are associated with reckless and aggressive behaviour and, when sustained over days, may precipitate a psychosis.
- There are marked temporal and developmental sequences concerning the ages of first use and the order of onset of drugs. The mechanisms by which legal drugs serve as 'gateways' in some sense for illegal drugs are not clear. Early adolescent use of cannabis significantly increases the risk of later use of other illicit drugs, but nonetheless, only around 10% of cannabis users progress to use other illicit drugs.

It is clear that patterns of drug use and related harms are not distributed randomly across the population but that there are defined groups in contemporary Australia that are over-represented in the statistics. These groups are usually also those that are over-represented in statistics on general ill-health. Firstly, across all drug types, being male and being young are each independently highly predictive of involvement in risky drug use and harm. Secondly, almost any measure of disadvantage will be similarly associated with increased risk and harm from drugs, regardless of gender and age. The association of drug use and measures of social disadvantage is strongest for the illicit drugs versus the licit and also for more intensely problematic patterns of drug use, including dependence. Related to findings of social disadvantage, there are indications that social disconnection is increasingly a modern driver underlying drug-related harm.

Comprehensive reviews of longitudinal and other studies examining significant influences on the drug use of young people have identified factors such as family functioning, school performance, peer influences, temperament and local drug availability as predictive of who will use drugs. These variables have been combined to form overall survey measures of risk for, and protection against, a variety of problem behaviours including drug use. Children with high scores on the risk scale and low scores on the protection scale are more likely to drink in a risky fashion, smoke, use illicit drugs,

experience mental health problems and exhibit conduct disorder. Evidence suggests that early initiation and frequent youth drug use is most clearly predicted by the cumulative number of elevated risk factors, rather than by any specific risk factor.

Further analysis of a major Australian data set on risk, protection and adolescent problem behaviours was conducted to inform the present project. This analysis suggests that 'whole of population' or universal strategies are of particular importance in relation to reducing the more prevalent harms associated with tobacco and alcohol use. However, strategies targeted to high-risk children and adolescents may be necessary to prevent the harms associated with illicit drug use. As high-risk youth generally have high levels of drug use, the more targeted strategies will also benefit the prevention of harms associated with legal drugs and cannabis. To maximise their effectiveness, targeted strategies should be initiated early in the developmental pathway and aimed to reduce risk factors, enhance protective factors and to prevent or delay drug use.

Evidence is summarised for the relative effectiveness of interventions and policies from pre-conception through to prenatal care, antenatal care, infancy, pre-primary, primary school, adolescence, young adulthood, adulthood and old age. The quality of the research was highly variable; the types of outcomes examined ranged from known risk factors for later drug use, to age of onset of use of different drugs, to intensity of drug use, dependence and experience of problems relating to drug use. In some areas, it was possible to state whether or not wide implementation could be confidently recommended; in others there were theoretical reasons to recommend that interventions should be trialled; and in others there was no relevant literature upon which to draw.

The evidence for investment in early life-stage interventions suggests a range of opportunities for encouraging healthy child development and thereby preventing children's drug use and progression to heavy and harmful use. Prior to birth and also in childhood, the healthy development of children can be impaired through parental tobacco, alcohol and illicit drug use. Further innovation investment will be required to develop and evaluate health service reorientation programs that can be more effectively applied to address these problems.

There is an emerging evidence base for universal interventions focusing on adolescent use of alcohol and tobacco. A combination of well-designed and

executed regulatory approaches, supported by other components such as school-based interventions, holds the most promise. There is very strong evidence and a sound rationale for the enforcement of laws prohibiting sales of both tobacco and alcohol to persons under legal purchasing age for these legal drugs. Similarly, there is evidence for the effectiveness of measures that control the price of alcoholic drinks favoured by young people.

Common benefits can be obtained through broad-based preventive interventions addressing a wide range of health, social and criminal problem behaviours. Firstly, there are benefits associated with universal programs to reduce or eliminate the social and developmental risk factors that predict the development of problem behaviours. Secondly, benefits can be obtained through programs that target individuals and groups with a high number of developmental risk factors in settings such as disadvantaged areas, family crisis, police and court contacts and mental health. Thirdly, benefits are available through programs for adolescents and adults who have high rates of drug-related harm. Examples include broad-based health promotion interventions delivered by primary care health professionals such as general practitioners (GPs), occupational health workers and also community-wide health screening and brief intervention programs. The potential public health benefits for the broad application of screening and brief intervention programs targeting a range of health risk behaviours has not yet been realised in Australia.

Universal regulatory interventions for legal drugs are essential. Regulation of the supply of both tobacco and alcohol products, supported by a range of public education measures, is strongly supported in the research literature. Young people, as well as heavy drinkers and smokers, are most affected by price increases. At present there are consistent taxation policies in place to maintain the high price of cigarettes in Australia and these should be sustained. For alcohol there are sound policies in place, from a public health point of view, in relation to beer and spirits. The main weakness in current policy is the absence of an alcohol content-based tax on wines, resulting in the availability of very cheap bulk wines favoured by vulnerable groups and problem drinkers. Taxation policy also encourages the consumption of wine-based fruit drinks ('alcopops') and premixed spirits that are particularly marketed to young people.

Restrictions of sales of both alcohol and tobacco to minors can be effectively enforced. There is

community support for strict enforcement of these laws but also evidence, especially in relation to alcohol, that underage youth access is relatively easy. Physical availability of alcohol in terms of numbers of outlets and hours of sale has increased in Australia over the last decade and Australian and overseas evidence now clearly identifies late night trading for hotels and nightclubs as a source of alcohol-related violence and road trauma. The development and enforcement of laws to punish and deter drink-driving in Australia have been major successes for public health and safety with uniform laws in place across Australia.

There is strong evidence that public education campaigns can contribute to reductions in smoking and risky alcohol use, but usually only if they support other policy measures such as tax increases and law enforcement. The community is an effective way of organising and delivering prevention targeted at legal drugs, especially alcohol, but community-based interventions that target structural policy change at the local level are more effective than approaches with the less focused aim of community mobilisation. Thus community action to restrict trading hours in high risk communities, to increase enforcement of drink-driving and liquor laws and to restrict local alcohol availability are reported to have achieved the most positive results.

In relation to the prevention of illicit drug use, the role of law enforcement is central. Laws shape community values and opinions about drug use. On the one hand, they express social disapproval that reinforces social norms against illicit drug use and on the other hand, they act as a deterrent against use. The current National Diversion Initiative demonstrates the importance of the law enforcement role in the apprehension of early users and referral to education, treatment or support. Drug courts are another important way in which drug users are given the opportunity to deal with their drug use in an effective and structured way. Many programs in prison are directed towards the high rates of illicit drug use among prisoners.

The impact of laws prohibiting the sale, supply and use of certain drugs is very hard to ascertain from current scientific evidence. Acknowledging the difficulties in working in this area, a major investment in research is recommended to improve the future evidence base for illicit drugs policy. Literature evaluating the impact of changing the precise legal status of cannabis, including some important Australian studies and reviews, indicate that moving from criminal to civil penalties for use

and possession of small quantities is not associated with significant increases in the prevalence of cannabis use and may reduce the social costs related to conviction.

There are important intersections between the aim of population-level prevention of drug-related harm and what has traditionally been considered to be treatment. There is emerging evidence that investment in various forms of treatment will have benefits in terms of community level reductions in crime, road trauma, hospital admissions and other serious drug-related harms.

These savings can be enhanced by:

- expanding brief intervention programs that target smoking and risky drinking, to a wide range of primary health care, workplace and other community-based settings;
- ensuring that treatment programs offered include approaches with the strongest evidence base and that these are made widely accessible, perhaps through a greater emphasis on delivery at the community rather than institutional level; and
- incorporating interventions to support children in families with drug-using parents in order to attempt to break inter-generational patterns of transmission of problem drug use.

There have been few formal evaluations of Indigenous intervention projects. In part, but not wholly, this is related to Indigenous concerns about what constitutes culturally appropriate indicators and methods for evaluation. The evaluations that have been undertaken have reached similar conclusions to those reports and submissions that address substance misuse among Indigenous Australians. The first recommendation is the need to address the underlying social determinants of Indigenous inequality. This includes the call for real, but appropriate, economic development for Indigenous people.

The second recommendation is the need for Indigenous people to be involved as equal partners at all stages in the development and implementation of strategies to address substance misuse. There is evidence from both Australia and overseas of the efficacy of Indigenous ownership and control of interventions to more generally address ill-health. As important as Indigenous involvement is, it is insufficient without adequate resourcing—the third theme to emerge from recommendations to address substance misuse. There has clearly been an increase in funds identified by the Commonwealth for

expenditure on Indigenous affairs over the past three decades. Whatever the levels of funding, however, they have failed to meet the well documented needs or to remedy the social and economic inequalities that underlie and perpetuate the high levels of substance misuse among Indigenous Australians. An important component of adequate resourcing is the building, within communities and community organisations, of capacity to continue to provide adequate and appropriate services. This includes infrastructural development, research capabilities, and staff development and support.

Over the past three decades, government policy on Indigenous health and substance misuse has acknowledged a link between substance misuse and underlying social issues. However, despite this acknowledgement, substance misuse policy and service planning has largely been developed in isolation from policies in other portfolio areas such as land, employment, education and housing. Furthermore, substance misuse services have been implemented inconsistently across different regions of Australia as attested by the mismatch between regional funding allocations and population levels. Concerns over such problems underlie the fourth theme—that is, the need for a holistic and coordinated approach that includes Indigenous community-controlled organisations, all levels of government, and all sectors.

The Protection and Risk Reduction Approach to Prevention holds advantages not simply for reducing the harm to Australian society from drug use, but also for broader social improvement goals. Investments in prevention should aim to maximise the potential for early childhood development, while also acknowledging that development and socialisation have ongoing threads in later years. The benefits that could flow from such investments range from the maximising of human potential, through to increasing productivity and achievement, with ultimate outcomes for improving both the wealth and wellbeing of the nation.

PART 1

INTRODUCTION

CHAPTER 1: INTRODUCTION

Efforts to monitor drug use trends, to document drug-related harms, and to develop and test interventions to prevent drug use and harms have generated an expanding stream of information flowing into a broader ocean of literature. For those seeking to extract wisdom from this broad sea of text, the contrary currents must be navigated and carefully designed nets applied.

This Monograph trawls the existing evidence base to capture the essentials regarding ‘what works’ in the prevention of substance use problems. It brings together what is known about the prevention of drug use, risk and harm in the Australian community with some particular foci: social determinants of health; risk and protective factors through the life span; developmental milestones, transitions and trajectories; and systems approaches to drug prevention. The document has been prepared so that a comprehensive national prevention agenda can be implemented with synergistic actions across multiple government departments and sectors of society.

Over the last two decades, the Australian community has become increasingly concerned about drug-related harm and the cost of drug use, both licit and illicit, which was estimated in 1998–9 to be \$34.4 billion.¹ Laws and regulations, community education, school drug education, harm reduction programs and treatment (particularly, lately, as it relates to diversion from criminal justice) have all addressed these concerns, with varying degrees of effectiveness.

1.1 The National Drug Strategy (NDS)

Australia has a balanced national drug policy that is based, in large part, on the recommendations of the 1977 report of the Senate Standing Committee on Social Welfare (The ‘Baume Report’) that argued, *inter alia*, that total elimination of drug abuse was unlikely.² In a submission to the House of Representatives Standing Committee on Family and Community Affairs, the Department of Health and Ageing stated that the overall aim was ‘to minimise the harmful effects of drug use in Australian society’, or harm minimisation. This was defined as ‘encompassing supply reduction strategies to disrupt production and supply of illicit drugs, demand reduction strategies to prevent the uptake of harmful drug use, and harm reduction strategies to reduce

drug-related harm for individuals and communities’ (p71).² The current NDS and its forerunners were created with strong bipartisan political support and involve cooperation between the Commonwealth and State/Territory Governments as well as the non-government sector. The current Strategy runs until 2003.

In 1997, the Commonwealth Government allocated \$516 million over four years to the National Illicit Drug Strategy (NIDS) which is a major component of the current NDS. NIDS provides a balanced and integrated approach to reducing the supply of and demand for illicit drugs. Initiatives funded include diversion programs, treatment, prevention, training, monitoring and evaluation, research and measures to intercept more illicit drugs at the border and within Australia. Prevention initiatives include the Community Partnerships Initiative and the National Illicit Drugs Campaign which are reviewed in this document.

Within the NDS, it has been recognised that there is a need for a systematic approach to prevention that spans all elements and is underpinned by a practical approach that supports implementation of prevention strategies. This Monograph provides the evidence base to underpin the Prevention Agenda proposed for Australia. The goal in setting the evidence base for the Prevention Agenda is to establish an integrated map of the systems, pathways and strategies that act as interconnections among and between risk factors, protective factors and outcomes related to the prevention of drug-related harm. The aim has been to produce a comprehensive review of international scientific literature and experience relating to prevention in the context of drug supply, use and harm.

Prevention in this context refers to measures that prevent or delay the onset of drug use, as well as measures that protect against risk and reduce harm associated with drug supply and use. It is intended that the Prevention Agenda will adopt strategies informed by the evidence base on the uptake of drugs in the first instance, and reduce drug use in general, as well as seek innovative approaches to harm minimisation. To ensure social investment is well targeted, prevention priorities should be directed particularly at drug use that is associated with a measurable risk of harm.

1.2 The scope of the Monograph

The Monograph encompasses:

- the full spectrum of prevention intervention measures,
- evaluated Australian approaches to the prevention of drug supply, use and harm,
- approaches to prevent or delay the uptake of licit and illicit drugs by children and young people,
- current application of prevention policy and strategy in Australia,
- gaps in prevention knowledge and effort.

To undertake this task, we have:

- identified the major patterns of use, risk and harm accruing to drug use in Australia using the most contemporary data,
- overviewed the social and structural determinants of health and drug use, internationally and in Australia, with a particular concern for Indigenous Australians,
- reviewed the literature on risk and protective factors relating to drug use and other psychosocial problems,
- reviewed the literature relating to the evidence for a range of prevention strategies, both in Australia and internationally,
- included every drug type identified by the NDS,
- where possible, distinguished between different age groups, from conception to old age,
- made recommendations for policy and research.

This is an ambitious work. We are not aware of any other single volume that has brought together such a diverse range of literature relating to prevention of not only use, but also risk and harm, from the perspective of demand, supply and harm reduction. Inevitably, there are some areas that are covered more thoroughly than others, that is the nature of the literature.

Our approach to this task has been inclusive. Both the National Drug Research Institute and the Centre for Adolescent Health are fortunate in employing some of the best expertise in Australia in the areas of licit and illicit drug use, Indigenous substance use, and childhood and adolescent health. We have made extensive use of the thoughts and writings of our colleagues and experts from other institutions who, in many cases, have drafted new material for

this Monograph. We have also sought advice from other experts who have helped us to select material and review drafts. We have listed these colleagues and experts and their areas of contribution in the acknowledgements.

The remainder of this chapter introduces some of the concepts and terminology that were considered important in the development of this Monograph. We close with an outline of the legal status of the substances of concern to this review.

1.3 Patterns of drug use and drug-related harm

Central to the thesis of this review is that a comprehensive Prevention Agenda needs to be guided by a shared understanding of the nature of the harms to be prevented and, correspondingly, of the underlying patterns of risky drug use. As will be discussed further below, the concept of 'risk' needs to be expanded to include more distal risk factors for harmful patterns of drug use, including social and demographic factors as well as early developmental risk (and protection) factors. The first substantive part of the review overviews current information about the nature and prevalence of the most serious harms associated with different patterns of use of various substances.

There are four main categories of drug use patterns that pose a risk of adverse health, safety, social, developmental and economic consequences, any one or all of which may be present. These are summarised and illustrated in Table 1.1 and are adapted from a classification system first developed for the World Health Organization.³ The first category is the *mode of administration* of the drug: oral ingestion (eating or drinking) tends to be least associated with harmful consequences and also results in slow absorption into the blood stream and central nervous system; smoking and inhalation tend to produce immediate effects, as does injection. Injection of drugs allows large quantities of drug to be absorbed within the bloodstream almost instantly and poses particular risks for overdose. The second category of risky drug use involves *intoxication*, which is associated with an increased risk of both intentional and unintentional injuries, but also some acute medical and sometimes psychiatric conditions. There are many serious illnesses associated with *regular* and prolonged use of some drugs. These have been particularly well documented for tobacco and alcohol.

Finally, there are problems of *dependence*. Dependence is currently defined in the Diagnostic and Statistical

Manual of Mental Disorders, produced by the American Psychiatric Association (DSM-IVR)⁴, as a 'maladaptive pattern of substance use, leading to clinically significant impairment or distress'. It is further stipulated that at least three of the following signs must have been evident in the previous 12 months: increased drug tolerance, repeated withdrawal symptoms, drug use to relieve withdrawal symptoms, high salience of drug-seeking behaviour over other activities, a narrow repertoire of drug use, subjective awareness of a compulsion to use drugs and rapid reinstatement of symptoms after a period of abstinence. It should be noted that this definition is an attempt to operationalise a clinical concept developed mainly from the work of Edwards and colleagues in the 1970s and 1980s.⁵ The original formulation stressed the importance of: (i) considering drug dependence as existing on a continuum of severity, and (ii) comprising both physiological processes (neuro-adaptation to prolonged exposure of the central nervous system to drug effects) and learning processes (e.g. learning to use drugs to relieve withdrawal distress). Problems of dependence are direct in terms of a propensity to experience physical and psychological withdrawal symptoms, of mild to severe intensity, if drug supply runs out or runs low. Indirect problems of a social, legal and economic nature may accrue as a result of impaired control over drug intake leading to patterns of use that are in conflict with personal, work and social commitments.

Each of the patterns of risky drug use shown in Table 1.1 can be associated with differing degrees of disruption of functioning in all main areas of life depending on duration, frequency and intensity of drug use. Equally, almost none of the potential harms identified from risky patterns of drug use are inevitable; rather their risk of occurrence is increased by differing degrees, although there is consensus that all tobacco use is harmful. Furthermore, the degree of risk associated with a particular pattern or episode of drug use will also depend on many other contextual factors, which may include broad social circumstances, diet, context of use, concurrent activities, the nature of the drug concerned and any concurrent use of other drugs.

The prevention of drug-related harm needs to be able to identify and reduce major patterns of risky drug use. At present, Australian laws identify many drugs as so hazardous to health, safety and/or wellbeing that any use is deemed to be illegal. Tobacco use is legal for persons over 18 years of age but there is no medically recognised safe level of smoking tobacco. Alcohol consumption on the other hand, while a small risk for some cancers when consumed in moderation is also, at low daily doses, associated with reduced risk of heart disease and some strokes. Different prevention strategies are required that reflect these different patterns of risk and harm.

Table 1.1 A classification of patterns of risky drug use and examples of possible associated harms to health, safety and wellbeing

Category of harm	Drug administration	Intoxication: acute effects	Regular use: chronic effects	Dependence
Developmental	Use in pregnancy, environmental tobacco smoke and children	Family conflict, impaired parenting	Early and regular use by children, parental modelling	Child abuse and neglect
Physical health	Injecting associated with spread of blood-borne viruses	Acute medical conditions e.g. poisoning, overdose	Cancers, strokes, liver and heart disease	Withdrawal symptoms, seizures
Personal safety	Smoking poses risk of respiratory diseases	Intentional and unintentional injuries to self and others		Risk-taking to protect supply
Mental health		Psychosis, reckless behaviour	Cognitive deficits	Mood disorders
Social wellbeing	Stigma associated with injecting drugs and criminal record	Legal problems, unwanted pregnancy	Financial problems	Financial, work and relationship problems

Some sub-populations experience particular risks of harm. Relevant harms for children and young people include adverse developmental influences. Ensuring healthy child development introduces prevention goals that include reducing pre-birth exposure to toxins (tobacco and alcohol), preventing child exposure to tobacco smoke and delaying or preventing initiation of alcohol and other drug use.

Indigenous communities and families experience high levels of drug-related harm and prevention approaches that have relevance to these populations have been given particular emphasis throughout the document.

1.4 Perspectives on prevention

A number of perspectives on prevention have informed the present work.

1.4.1 The Public Health Systems model

This model (Figure 1.1, p. 9), which was adapted by Lenton⁶ from an earlier model by Holder,⁷ illustrates the levels of increasing breadth and complexity at which prevention activities can be focused, from work with individuals to national and international approaches. The model conceptualises determinants of health and drug use on a continuum from macro to micro: social and structural determinants are distal influences while risk and protection factors are more proximal. The model is both top-down and bottom-up: the macro clearly influences the micro, but equally clearly the micro influences the macro. Activity at any one of the levels can influence not only that level but, indirectly, all other levels. This approach allows the mapping of systems, pathways and strategies that connect among and between risk factors, protective factors and drug use outcomes.

1.4.2 Universal, selective and indicated interventions

For several decades it has been common to classify health interventions into primary, secondary and tertiary prevention where primary prevention aims to reduce risks and prevent new cases, secondary prevention seeks to limit harm in the early stages of a disorder, and tertiary prevention treats the long-term sequelae and consequences of the disorder. An alternative conceptualisation of prevention that has gained much currency is that provided by the US Institute of Medicine in 1994.⁸ This categorisation is based on the level of risk of disorder in various groups targeted. Universal interventions are directed

at whole populations at average risk; selective interventions target groups at increased average risk and indicated interventions target those individuals with early emerging problems. The latter model has been used alongside a broader risk and protection model outlined below, and the term targeted-intervention has been used in this document to refer to a combination of selective and indicated interventions.

1.4.3 The Risk and Protection model

A major focus of this report is on common early pathways to a variety of psychosocial problems including crime, mental illness and suicide, and evidence that such pathways may also be significant for problematic involvement with both legal and illegal drugs. The risk and protective factors associated with antisocial and criminal behaviour have been described and discussed in the work on developmental and early intervention approaches to the prevention of crime in Australia,⁹ and also in relation to adolescent substance use.¹⁰ The specific application of these approaches to the primary prevention of drug use among children and young people has formed a major part of our work. Risk and protective factors originate within a variety of environments, such as the family and education systems, and are influenced by community and cultural factors⁹ and these have been taken into consideration.

The developmental pathways model holds potentially important implications for the prevention of drug-related harm to children and young people. Strategies emerging from the developmental pathways model include objectives relevant to positive youth development, such as social participation and wellbeing. Inter-sectoral Australian approaches to the prevention of social problems, which include programs informed by the emerging research in developmental health and wellbeing, may be among the more promising initiatives for the prevention of drug use and drug-related risk and harm. The developmental perspective also emphasises the importance of individual and contextual factors earlier in the pathway that contribute to the development of skills, resources and strategies that individuals bring to current situations, and frequently mentions the importance of situational factors, particularly in adolescence (e.g. peer interactions). In that sense it incorporates situational and harm reduction strategies.

The present report attempts a synthesis between the evidence base emerging from the developmental

pathways approach and the literature on efforts to reduce drug-related harm at the population level by targeting more proximal risk factors, that is, risky patterns of drug use, high risk drugs and high risk drug use settings. Thus risk factors in this model range from the distal (e.g. early developmental and social) to more proximal (patterns and places of drug use) factors that can be shown to predispose towards harmful drug use. Similarly, protective factors have been identified in the early developmental and social literature that are associated with a lowered likelihood of later drug-related harms for those with a high number of risk factors. This concept of protection can be expanded to incorporate more proximal factors such as reduced drug availability and low risk patterns of use (including abstinence). Many harm minimisation strategies can also be defined as protective factors.

The idea that there are common risk and protective factors for substance use and other problem behaviours is also captured, together with the idea of reciprocal interactions between other problem behaviours and substance use. Evidence that mental health and substance use problems often co-occur and that each can be risk factors for the other is considered in this report.

This model is summarised in Figure 1.2 (p.10).

1.4.4 The Prevention Paradox and its application to use of different drugs

The 'Prevention Paradox'¹¹ demonstrates that to prevent the most amount of harm, it may be necessary to focus (through universal interventions) on the majority who are not as seriously involved in harmful drug use as are the smaller proportion of high risk users. To date this issue has been considered in relation to alcohol but less so in relation to other drugs, although arguably a case could be made for tobacco, given that prevention initiatives discourage non-smokers from contemplating smoking as well as motivating others to quit. A new analysis of a large data set is presented in this Monograph that addresses the extent to which, in general, universal or targeted interventions are more appropriate for the risky patterns of use for each of the major drug categories considered. This analysis also has relevance to a social determinants view of problems relating to drug use since it addresses whether the bulk of harmful drug use can be located within disadvantaged and otherwise high risk populations, or more generally within the wider community.

1.5 Economic evaluations of alcohol and drug interventions

An economic evaluation framework is invaluable when considering the many different strategies of drug prevention available. In particular, it is important that policy makers clearly understand what a program costs in terms of the resources it consumes and what type of outcomes can be expected. Surprisingly, these two pieces of information are more often than not missing and drug programs are poorly evaluated. Too little economic evidence has been forthcoming to ensure that an efficient use of society's resources is being made across the drug policy arena. Much evidence still rests on the individual impact or effectiveness of programs without specifying the resources needed to bring this about.

In the methodology literature there is some debate concerning the type of economic evaluation to use in drug interventions, in particular the techniques of cost-effectiveness analysis (CEA) and cost-benefit analysis (CBA). Both are useful supplements if studies are well designed in the first place. Whereas CEA measures a given amount of pre-specified outcome obtained by a program for a given amount of expenditure, CBA converts the outcome(s) achieved into a monetary amount and compares this with the cost. This allows benefit-cost ratio (BCR) or a return on investment (ROI) to be calculated. In particular, benefit-cost analysis forces explicit comparisons between costs and benefits by measuring both in the same unit. However, only those programs with the highest positive BCR (at net present value) can usually be taken up because of budget constraints. Hence many clinicians prefer CEA believing these analyses to be more clinically meaningful and less political in nature than cost-benefit studies.

Benefit-cost ratios may prove useful when based on results that capture the full benefits in monetary terms. However, cost-benefit studies do have some limitations in the way intangible benefits are treated because of the reliance on monetary valuation. Intangible benefits such as a peace of mind, security from crime, freedom from dependency etc are hard to put into monetary terms and so are thus often overlooked without employing more sophisticated methodologies such as 'willingness to pay' or contingent valuation.

If a range of outcomes additional to the costs of drug use are monetised for prevention programs, stronger benefit to cost ratios may result. Reduction of risk factors such as academic failure is likely to

lead to a host of cost reductions in addition to reductions in drug use problems. These should be monetised to fully appreciate the full impact of interventions on cost reductions. For example, reduction of academic failure is likely to lead to greater completion of high school, increased attendance at college and greater job opportunities, which can be monetised as benefits of early school-based prevention efforts.

1.6 The legal status of drugs

The legal status of the substances of interest in the Monograph has been summarised in the following table, using categories suggested by McDonald *et al.*¹² Only the major drugs of concern are included.

A wide range of laws and regulations control or restrict the availability of licit drugs, notably alcohol

and tobacco. These include licensing restrictions, advertising controls, the regulation of sale and supply of alcohol and tobacco to minors and taxation initiatives that impact on the cost of legal drugs. Other control strategies include initiatives to limit the free availability of inhalants, particularly to minors.

The distinction between ‘licit’ and ‘illicit’ drugs is not absolute. Some drugs, such as alcohol and tobacco, can be legally sold to adults but not to minors; some prescription drugs can be obtained legally but are also used for non-medical purposes, or obtained with stolen or bought prescriptions, by ‘doctor shopping’ or on the black market. Some communities have chosen to limit or proscribe the supply of alcohol and the use of alcohol, as well as illicit drugs, is prohibited in prisons.

Table 1.2 Classifications of the legal status of drugs of concern in Australia

Total prohibition	Heroin, methamphetamine, cocaine, phenethylamines, LSD, mushrooms, GHB/GBL, cannabis in some jurisdictions
Prohibition with civil penalties for minor offences	Cannabis in some jurisdictions
Regulation	<p>Restrictions on availability of tobacco and alcohol</p> <p>Pharmaceutical restrictions (Standards for the Uniform Scheduling of Drugs and Poisons)</p> <ul style="list-style-type: none"> • poisons for therapeutic use (drugs) are included in Schedules 2, 3, 4 and 8 with progression through these schedules signifying increasingly strict controls • substances that should be available only for medical or scientific research, including clinical trials, on Schedule 9 <p>Controlled substances</p> <p>Substances controlled under import and export legislation are those which are of sufficient public health concern internationally to warrant restrictions to ensure legitimate use only</p> <ul style="list-style-type: none"> • hallucinogens • narcotics • barbiturates • benzodiazepines • tranquillisers • amphetamines <p>Substances controlled for importing but not exporting</p> <ul style="list-style-type: none"> • injections containing substances of human or animal origin • androgenic or anabolic steroids • peptide and glycoprotein hormones (for example human growth hormone, human chorionic gonadotrophin) • erythropoietin (EPO)
Free availability	OTC drugs sold in non-pharmacy retail outlets Some inhalants

Figure 1.1 A Systems model for the prevention of alcohol and other drug problems (from Lenton⁶)

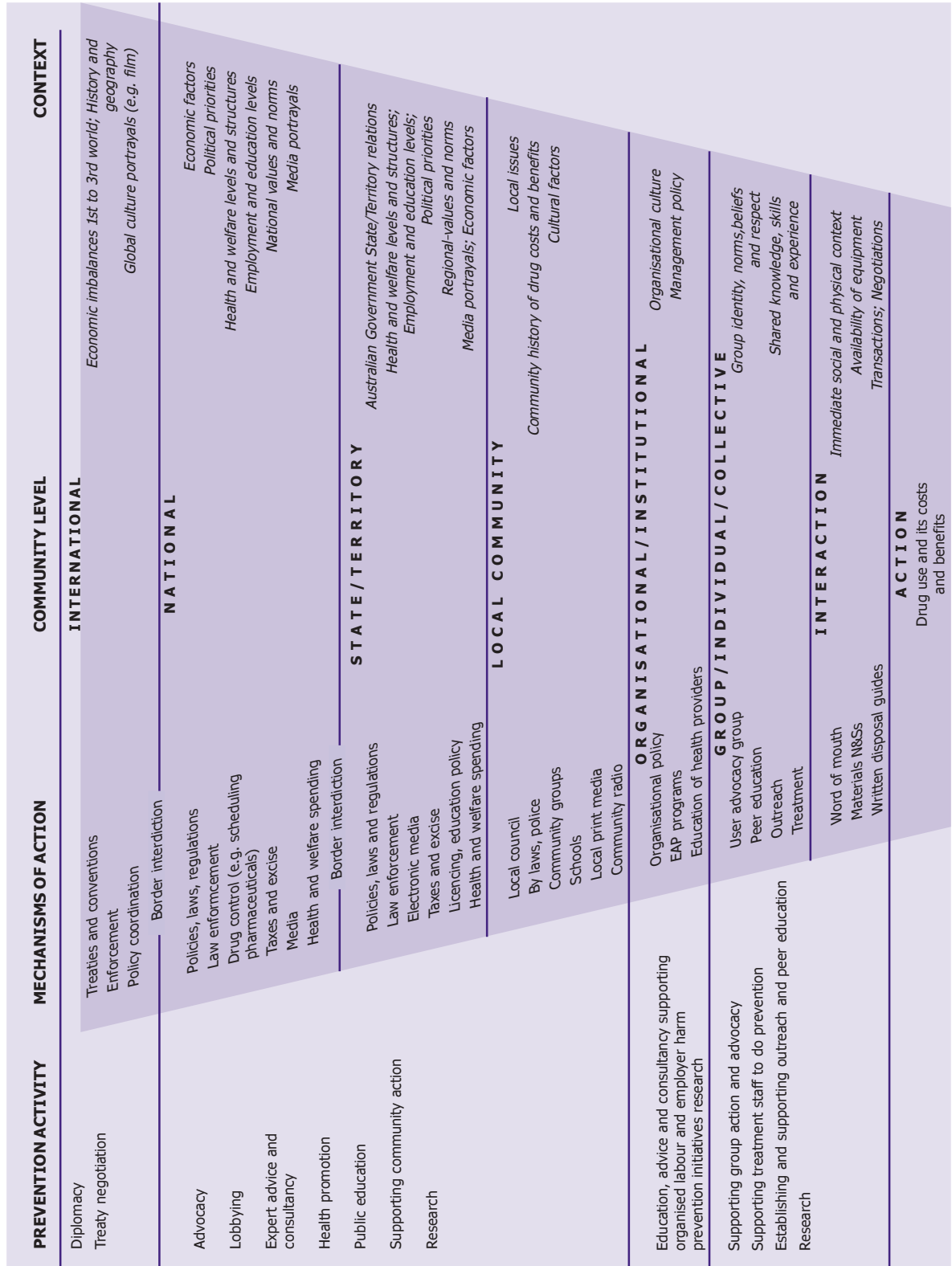
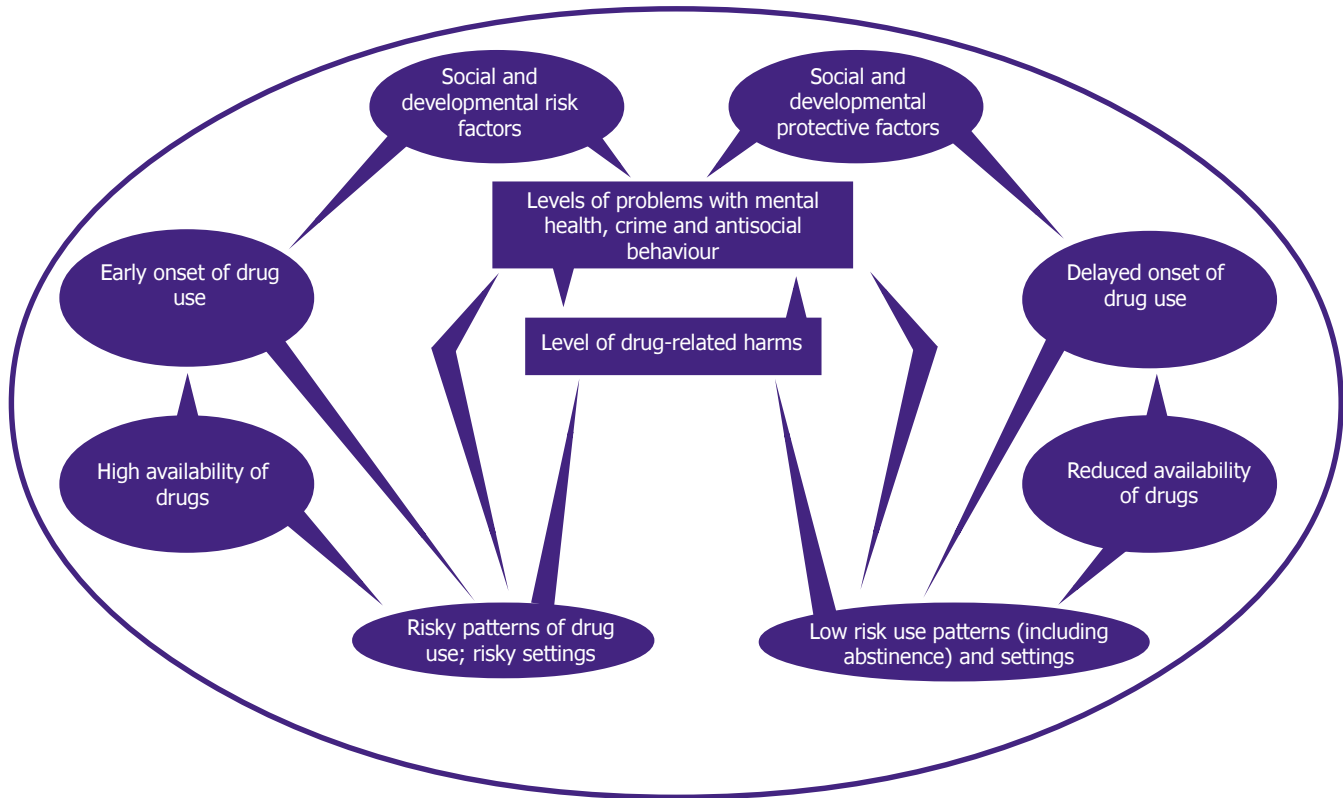


Figure 1.2 A Risk and Protection model for the prevention of drug-related harm



CHAPTER 2: METHODS

2.1 Summary

This chapter outlines the methods used in the review, including criteria for literature inclusion, and procedures for locating and evaluating literature. Both longitudinal and cross-sectional studies were included in the consideration of the contribution of specific patterns of drug use to harm, and in examining determinants of patterns of drug use. Environmental influences that operate across aggregates of individuals at international and national levels were defined as social and structural determinants, while risk factors were more narrowly defined according to their influence in increasing the probability that an individual or group would subsequently become involved in early or heavy drug use or experience drug-related harm. Protective factors were defined according to their influence in moderating and mediating the influence of risk factors, while not influencing drug use directly.

We have reviewed evidence relevant to the effectiveness of intervention programs aiming to reduce risk factors, enhance protective factors and reduce harmful drug use; to individuals, their families and the community. The effectiveness of prevention programs was categorised using a classification system of six mutually exclusive criteria that briefly summarise the status of research evidence for each strategy. At every stage we have attempted to review materials relevant to the full life-course and to differentiate age-specific findings and strategies.

2.2 Introduction

To yield the wisdom within the vast sea of text, it is important to trawl the literature on drug use and harms systematically and carefully evaluate the catch. In order to achieve the intended destination of reducing drug-related harm, the prevention journey should begin by carefully mapping the harms that result from drug use and the range of factors that influence involvement in such behaviour. In the section that follows, the methods used to determine search, retrieval and appraisal processes are described.

The term 'drug' refers in this report to all categories described within the National Drug Strategic Framework. In considering patterns of use and harms, separate consideration has been given to the legally available drugs: alcohol, tobacco, pharmaceuticals, inhalants, and performance and image enhancing drugs. For the illicit drugs, separate consideration has been given to cannabis, heroin, amphetamine-type stimulants, hallucinogens, phenethylamines (such as MDMA), cocaine, ketamine and poly-drug use.

In this report the term *intervention* refers to the core processes through which interventions are theoretically conceived to achieve behaviour change. *Programs* are vehicles for delivering and sequencing interventions over time. *Strategy* is the broad umbrella term for describing the coherent organisation of programs within settings.

2.3 Patterns of use

To reduce harmful drug use requires distinctions of not just the different types of drugs being used, but also variations in the frequency and amount of drug use over time (defined here as patterns of use). The most recent and accurate statistical evidence available was sought for estimates of the proportion of the Australian population using drugs at various levels of intensity and by various means. National level data sources were given priority over State and regional data, though national estimates of geographic variation in patterns of use are reported. To this end, reports from national government departments, statutory authorities and national research centres around Australia were sought. Where gaps were found, supplementation was sought with other evidence identified by in-house experts, and through searches of Institute* libraries. This strategy provided the most accurate picture currently available of the epidemiology of drug use in Australia.

2.4 Harms

To maximise benefits, prevention activities should be based on a careful appraisal of the harms resulting from patterns of drug use. Evidence for harms arising through drug use relies at one level on associations between patterns of drug use and harms. A higher level of evidence requires, however, findings from follow-up and experimental research to establish that an associated

* NDRI and CAH

harm can be reduced by preventing a specific pattern of drug use. To identify literature relevant to harms, in-house searches were conducted for material relating to frequency or relative risk of harm, which included searching the Institute libraries, consultation with in-house and other experts, and examination of all the citations and abstracts in peer reviewed journals, reports or other documents arriving via mailing lists. Gaps were filled with specific searches (PsycINFO, Medline, Internet) on harms for particular drugs and for particular types of harms, settings and outcomes (e.g. overdose, dependence, crime, and workplace issues). In addition, the 'pearling' technique (that is, examining the reference lists of reports and then obtaining the original report) was used to source information relating to this section of the report. The data were critically assessed and cross-checked for accuracy before being reported.

A particular focus in examining drug-related harms for young people has been evidence for the impact of drug use on development. To identify developmental impacts, information from follow-up studies was sought and reviewed, where available. Locating these studies utilised the techniques described above.

The inclusion criteria for follow-up studies required:

- measurement of drug use behaviour prior to the end of adolescence (age 25),
- that follow-up measurement included one or more harms,
- an explicit sample selection framework (either a community or high risk population) with sampling adequate to permit unbiased parameter estimation,
- that problems with attrition were addressed (either 80% or more of the initially recruited sample were retained to follow-up or analyses for attrition were adequate to ensure results were representative).

2.5 Social determinants

Having examined evidence for the harms resulting through particular patterns of drug use, attention was turned to identifying factors that influence involvement in harmful drug use. Although it is self-evident that drug use is influenced by immediate decisions and circumstances, what is often neglected is the important role that is played by a wider set of influences that determine the more immediate drug use context. In this report,

environmental influences that operate across aggregates of individuals at the international and national level were categorised as social and structural determinants. Under social determinants was considered the influence of class, gender, ethnicity and culture. The interaction of these influences was considered on structural determinants defined to include war and conflict, poverty and employment status as well as other factors relating to political organisation and macro-economic factors at the global, national and State levels. Literature on social determinants was identified via Institute staff, through noting and sourcing references to this area from the peer-reviewed journals and reports received via mailing lists, from bulletins posted on Update (an email information service for drug researchers and service providers), and from pearling reference lists. The limitations of this method of research are discussed within the text. Both Australian and international evidence was incorporated in this section.

2.6 Risk and protective factors

Knowledge has been accrued over the past three decades about factors at a community and individual level that increase the probability of drug use. Predictors have been identified, through follow-up and intervention research, as factors that increase the probability that an individual or group will subsequently become involved in harmful drug use. In this report we define risk factors as a special class of predictors that continue to prospectively predict drug use after controlling (or adjusting) for the influence of other known predictors. Risk factors were sought that have potential to be modified through interventions. Protective factors were identified according to evidence that they moderate and mediate the influence of risk factors, while not being themselves predictors of drug use. In accepting this definition it became apparent that many harm minimisation strategies can be defined as protective factors. To identify risk and protective factors, behavioural follow-up studies were carefully selected and reviewed. Follow-up studies that met the inclusion criteria described above were sought and reviewed. Follow-up studies examining factors in childhood and adolescence that predicted the emergence of harmful drug use patterns were specifically sought. In addition to drug use predictors, influences such as social determinants that impact on the emergence of risk factors were also considered.

For risk and protective factors relating to adults, a number of exploratory literature searches were

conducted on PsycINFO and Medline. These searches indicated that, with respect to adults, the literature does not address 'risk and protective factors' for use, but rather, reports risk and protective factors relative to particular harms. The current report is, therefore, one of the first attempts internationally to extend the study of risk and protective factors to influences leading to harmful drug use throughout life, from prior to birth through to late adulthood.

2.7 Interventions literature

Having investigated factors influencing involvement in harmful patterns of drug use, our attention shifted to the evidence for the effectiveness of interventions, programs and strategies aiming to reduce risk factors, enhance protective factors and reduce harmful drug use. The intervention literature was categorised to examine demand reduction strategies, beginning with broad based prevention programs and then examining programs more specifically targeting life stages and vulnerable population groups. The report then examines strategies aimed at supply reduction and harm reduction, as defined within the National Drug Strategic Framework.¹³ Demand reduction programs were further categorised by the type of strategy utilised and the impact on different patterns of drug use. Strategy definitions were amended from Toumbourou and colleagues,¹⁴ who classified programs according to similarities in the intervention delivery setting, or jurisdictions involved in service development and delivery. Where possible, evidence for specific programs was also summarised.

2.7.1 Inclusion criteria

An outline was developed that provided general guidelines for the inclusion of material in the project. The earliest publication date for included material was set at 1990. Any review pre-dating 1990 was only included if the material covered was not available in a more recent article of equal quality, or the material was of particular historical significance. Inclusion criteria aimed to obtain evaluation reports of the best available evidence. For strategies where randomised trials were reported, evaluations focused on effectiveness evidence from these studies.

In considering evidence within a social systems approach to prevention we become aware of a paradox: strategies that have the potential for the largest population impact often have the lowest potential for controlled evaluation. For example,

programs attempting to modify international treaties, or to intervene within international or national drug supply processes, have profound potential to impact drug use but limited potential for controlled evaluation. In these cases, the best available evidence is typically limited to the analysis of temporal changes in drug use behaviour under differing exposure conditions. Reports meeting the inclusion criteria were retrieved and systematically examined to rate the standard of evidence and then this evidence was synthesised to arrive at an evaluation rating for each strategy by drug behaviour outcome and, where possible, for specific programs.

For the adult prevention literature, material from experts was given primacy due to the likelihood that this material would represent the best evidence from each field, and that experts often have access to material that is not widely disseminated. Reviews from The Cochrane and Campbell Collaborations, organisations that apply rigorous scientific standards to their systematic reviewing process of the international literature in order to provide an authoritative and up-to-date evidence base in health care and criminal justice, were incorporated at the second inclusion stage.^{15, 16} This information was then supplemented with published systematic reviews other than those from The Cochrane and Campbell Collaborations. Although such reviews are often of a higher standard than normal literature reviews, they differ from Cochrane and Campbell reviews in that they are usually less stringent in their application of systematic principles, and are not regularly updated with new material. Following this process, reviews of the Australian literature were then incorporated due to their applicability to the Australian context. The final inclusion stage incorporated reviews of international literature that were most likely to provide evidence that may be applicable to the Australian setting.

Due to the limited time frame for the project, review articles were selected over primary studies; however, where reviews proved insufficient, primary studies were also included. Primary studies were selected for review from the resources available at Institute libraries or because of their historical importance in demonstrating the effectiveness of a specific strategy. Key informants at the Institute were also asked to identify relevant review articles relating to the prevention of drug-related harm, with respect to the main areas of investigation.

The review articles identified by key informants were then obtained, as were further relevant

reviews cited in the reference lists. Searches of Institute libraries' databases, the NDRI Indigenous Australian Alcohol and Other Drugs Bibliographic Database and the NDRI Indigenous Australian Alcohol and Other Drugs Intervention Projects Database were also conducted. Information postings on UPDATE were inspected daily as were all peer-reviewed journals and reports received via mailing lists.

In the second phase of the search strategy, scholarly electronic databases and online libraries for published and unpublished literature were explored. The databases searched included: PsycINFO, Medline, Embase, Current Contents, Dissertation Abstracts, SIGLE, Social Work Abstracts, National Clearinghouse on Alcohol and Drug Information (IDA), DRUG database, Alcohol and Alcohol Problems Science Database (ETOH), CINCH (the Australian Institute of Criminology library), The Cochrane Library, Campbell Collaboration (criminal justice version of Cochrane), the Lindesmith Centre, and general internet searches for specific reports in pdf and html format using the GOOGLE search engine.

The initial searches produced over 9000 studies. All titles and abstracts of articles produced in these searches were then examined in order to select potentially relevant reviews as per the areas of interest designated for investigation. The final search strategy supplemented material with relevant literature identified by experts contracted to assist with the project (see acknowledgements).

2.7.2 Evaluating the quality of evidence of the interventions literature

As well as general information from the Cochrane Reviewers Handbook,¹⁷ three articles were used to inform the process of evaluating review quality.¹⁸⁻²⁰ Reviews in the substance abuse area, like those in epidemiology and the medical sciences, have not been particularly systematic and tend to ignore quality guidelines.¹⁸ Common failures appear to be the lack of clarity regarding scope, search criteria and inclusion criteria, making it difficult to ascertain the validity of conclusions and recommendations.¹⁸ Despite this, review articles may still be of a reasonable quality even if some of these criteria are not explicitly stated, although this requires a good knowledge of the research area under investigation. Both Oxman¹⁸ and Rehm¹⁹ suggest that good reviews demonstrate the following characteristics:

- provide a good summary and critical evaluation of the state of knowledge;

- have the capacity to influence prevention, treatment and care;
- can be used to guide decisions for health policy/public health; and
- provide an assessment of gaps in the research and stimulate future research.

Furthermore, guidelines have been developed to ascertain the quality of review articles.^{18,19} Such reviews are classified as 'systematic reviews', and incorporate the following criteria.

- *Problem formulation*: a focused and clearly formulated problem.
- *Study identification*: a clear description of search methods.
- *Study selection*: criteria for inclusion/exclusion are reported; bias in selecting studies is avoided.
- *Study appraisal*: validity of studies included is assessed with stated criteria.
- *Data synthesis*: an appropriate combination of study findings based on reported criteria.
- *Interpretation*: conclusions that flow from the evidence and that are linked to the strength of the evidence.
- *Recommendations*: can in all parts be supported by the evidence.

These criteria were considered for both assessing the calibre of the evidence under review, and for reporting conclusions regarding the effectiveness of specific interventions. In particular, considerable attention has been given to ensuring that any conclusions drawn are linked to the strength of the evidence and do not exceed the evidence reviewed, and that values attached to outcomes (such as costs and risks of harm) are also considered. To ensure that key reviews were included, a number of experts were consulted to identify important material and to review drafts of the interventions sections.

Given the likelihood that few reviews would meet all of the criteria outlined above, the following core themes were adapted from Rehm¹⁸ and applied to this project:

- the role of experts and the limitations of relying heavily on expert advice;
- the value and availability of systematic reviews; and
- assessing review quality with respect to bias, comprehensiveness, interpretation of results and validity.

In general, reviews were excluded where they relied on expert views and provided no attempt to systematically utilise levels of evidence criteria to appraise empirical research. Reviews were appraised as of high, moderate or weak quality according to their fit with the criteria articulated above. A standardised evaluation checklist guided reviewers' assessments. Given the size and timeframe of the project, individual reviews were not evaluated separately. Rather, the checklist was used by reviewers to derive a qualitative assessment of the strength of the evidence for each type of strategy, and this is reported in the text.

Based on evidence from existing reviews and the appraisal of primary evidence, conclusions were reached regarding the effectiveness of strategies for reducing harmful drug use. To communicate conclusions regarding the 'best buys' for investment

in prevention, the categorisation developed by Toumbourou *et al.* was used.¹⁴ Six mutually exclusive categories were developed to briefly summarise the status of research evidence for each strategy in addressing different categories of harmful drug use at different life stages. The following categories were used to convey conclusions regarding the implication for future investment in research and dissemination.

- O Limited investigation
- ☒ Evidence is contra-indicative
- Ⓜ Warrants further research
- ★^P Evidence for implementation, ^P proportion of studies with positive effects
- ★★ Evidence for outcome effectiveness
- ★★★ Evidence for effective dissemination

Definitions

- O Limited investigation: no relevant effectiveness studies were located and there were no empirical or theoretical grounds suggesting the intervention might potentially impact the outcome; may also indicate that the evidence is inconsistent or contradictory.
- ☒ Evidence was contra-indicative for the use of this strategy to prevent the targeted outcome: consistent null or negative findings in well-controlled evaluation studies.
- Ⓜ Warrants further research: applied to strategies that appeared theoretically sound or had some promising evidence for their implementation or outcome, but the operational specifics of the delivery format were not clearly resolved or had been investigated only in small scale or inadequately controlled studies. Policies and programs utilising these strategies might be considered priority targets for future research funding focusing on innovations to better define service delivery.
- ★^P Evidence for implementation: published studies reported a sound theoretical rationale, a clearly specified service delivery format, acceptance within service delivery organisations, target population recruitment on a scale sufficient to usefully contribute to population health impacts, and adequate consumer approval measured using indicators such as program retention. ^P The proportion of positive demonstrations of impacts on risk factors, protective factors or outcome behaviours is reported. Although this rating required a clear service delivery format, in some cases not all other criteria were satisfied and in such cases this was indicated in the summaries. Policies and programs utilising these strategies might be supported for implementation where there are few costs and obvious benefits. In other cases wider implementation may await rigorously controlled outcome evaluation to better establish benefits.
- ★★ Evidence for outcomes: applied where positive outcomes were consistently published in well-controlled interventions. Interventions were required to be of sufficient scale to ensure outcomes within the constraints imposed by large-scale population health frameworks. Policies and programs utilising these strategies might be carefully monitored for their impacts while being supported for wide-scale dissemination.
- ★★★ Evidence for dissemination: published reports of impacts where programs were delivered on a large scale, not by research teams, but rather by government auspice bodies or other service delivery agents. Evidence for dissemination was only sought for strategies demonstrating evidence for outcomes. Policies and programs utilising these strategies might be accorded some priority for dissemination in the Australian context. Initial Australian dissemination trials should monitor for impacts. Where possible, cost-effectiveness has been considered for programs using these strategies.

It should be noted that these criteria for evidence for outcome are congruent with definitions commonly used by the National Health and Medical Research Council (NHMRC), The Cochrane Collaboration and other groups (e.g. systematic review of randomised trials). The category 'evidence for dissemination' is an innovation developed by Professor George Patton to address the challenge of system change in the health promotion field.

Each chapter that reviews interventions commences with a ratings table using these ratings. Where possible, interventions for individual drug types are reviewed and rated but the literature does not always allow this specificity. Other areas (e.g. broad-based prevention strategies, reviewed in Chapter 9) do not lend themselves at all to these ratings and strategies are summarised in terms of their applicability to drug use and harm.

In some cases, it might be wondered whether the authors have been sufficiently sceptical of the evidence base. Where reviews of studies with sophisticated statistical controls were available, they have been given priority, but it was also felt important not to overlook promising Australian approaches that may not yet have that level of evidence attached to them. Where there has been any doubt about a rating, the authors have erred on the side of inclusivity.

PART 2

PATTERNS OF SUBSTANCE USE AND HARM

CHAPTER 3: PATTERNS OF DRUG USE, RISK AND HARM IN THE EARLY YEARS

3.1 Summary

This chapter overviews patterns of drug use and harm in the Australian population from conception through to adolescence.

National survey data reveals increasing youth alcohol use through the 1990s despite an overall reduction of drinking in the general population for most of that decade. Most pregnant women continue to drink alcohol but, based on self-report data, less than 5% drink at levels likely to harm the foetus. There is a need for better monitoring of alcohol use in pregnancy. Acute harms such as accidents are disproportionately experienced in the younger end of the population, while chronic harms are largely experienced in the older population. Exposure to alcohol prior to birth can have negative developmental implications. Earlier initiation to alcohol use in childhood or early adolescence leads to more frequent and higher amounts of alcohol consumption in mid-adolescence and this pattern of use has been associated with the subsequent development of alcohol-related harms in late adolescence and adulthood. Adolescent alcohol use has also been linked to subsequent involvement in tobacco use and the onset of some patterns of crime and delinquency.

Youth tobacco use also resisted the overall declines in the general population during the 1990s, but is now beginning to decline. In the mid-1990s parents were smokers in around one third of families, however, information for monitoring maternal smoking is inadequate. Parental smoking during pregnancy and exposure to environmental tobacco smoke in childhood has been associated with a range of child health problems. Adolescent tobacco use increases the risk of tobacco dependence and is also a consistent predictor of subsequent mental health problems.

The non-medical use of pharmaceuticals appears prevalent in school surveys, with 22% of senior high school students reporting previous use of tranquillisers for non-medical purposes.

Finally, there are marked temporal and developmental sequences concerning the ages of first use and the order of onset of drugs. It is apparent that early use of tobacco and alcohol is predictive of later problems with both alcohol and illicit drugs. These associations appear to be maintained after controlling for a range of risk and protective factors. There is also evidence suggesting that harm reduction strategies can alleviate the development of alcohol-related harm in adolescents. Intervention research may be warranted to establish the relative merits of use reduction versus harm reduction approaches for the prevention of alcohol-related harm in adolescents. Adolescent use of cannabis significantly increases the risk of later use of other illicit drugs but, nonetheless, only around 10% of cannabis users progress to use other illicit drugs. Early age and frequent cannabis use appear to have negative developmental consequences, though there is only limited evidence of morbidity and of premature death associated with its use.

3.2 Influence of parents' drug use during pregnancy and early childhood

There are a number of ways in which parents' drug use can impact on their children from the moment of conception, through pregnancy and childhood.

The use of a variety of drugs during pregnancy may have an adverse effect, depending on dose and frequency, on physical development *in utero* and this may also impact on later emotional development.

- Breast-fed babies of drug-using mothers have been shown to ingest in the milk small quantities of the drug used by the mother.
- Children of parents with impaired control and/or other signs of drug dependence are more likely to suffer from neglect and various forms of abuse.
- Parental patterns of drug use have a powerful role of influencing children's drug use as young adults, through modelling.

- Parental smoking presents risks to infants and children as a consequence of passive smoking.

3.2.1 Exposure to drug use *in-utero*

The use of drugs by pregnant women and also women who are planning to become pregnant is an important issue for prevention policy. Adverse effects of maternal drug use have been documented on the unborn child and can affect physical and psychological development in both the short- and long-term. Specific effects have been best documented in relation to the use of legal drugs, in particular tobacco and alcohol. Evidence exists to suggest that the use of a number of illegal drugs can also be damaging though it is harder to separate out the effects of drug use from a constellation of other risk factors such as nutrition and poor physical and mental health of the mother. The nature and extent of these risks will be briefly summarised.

There is some information about the use of drugs by pregnant women in the 1998 and 2001 National Drug Strategy Household Surveys (NDSHS) but precise quantification of this risk behaviour is elusive. The 1998 NDSHS found that 75% of women who were pregnant or breastfeeding reported consuming alcohol, tobacco or at least one illicit drug in the previous twelve months. Among these women, 75% had drunk alcohol, 24% had smoked cigarettes, 18% cannabis and 8% used other illicit drugs. These rates were lower than those reported for women who were neither pregnant or breastfeeding.²¹

The 2001 NDSHS included further questions about alcohol and drug use during pregnancy.²² This showed that 41.5% of pregnant women and 45.8% of breast-feeding women had drunk alcohol. Only a small minority, however, stated that they had not either reduced their drinking or completely abstained while pregnant (4.4%) or breast-feeding (5.8%). There is a need for better monitoring of alcohol use amongst women who are pregnant.

Tobacco

Maternal smoking during pregnancy and early childhood is associated with impaired lung growth and diminished lung function.²³ Animal model and human epidemiological data also clearly point to a causal relationship between prenatal tobacco exposure and adverse behavioural and neuro-cognitive effects on children.²⁴ Potential pathways for effects include low birth weight and impaired *in-utero* brain growth.

Cigarette smoking is the single most important factor affecting birth weight in developed countries.²⁵ Several studies have confirmed this finding with many of these,^{25–28} including a Cochrane review²⁹, confirming the direct dose-response relationship.^{26, 30}

The effect of prenatal exposure on birth weight is more attributable to intra-uterine growth retardation than pre-term delivery.^{26, 29} Poor intra-uterine growth has a lasting effect on the subsequent growth³¹ and development of children.³² Low birth weight infants are at increased risk of emotional and behavioural problems^{33–35} and the sequelae of low birth weight also include lowered cognitive abilities and hyperactivity.³⁴ An increase in neurological damage has been found among low birth weight children,³⁶ which has in turn been associated with increased risk for subnormal IQ and learning disorders. Low birth weight is also associated with increased risk for reading and math disabilities.³⁷ However, it remains unclear whether modest decrements in birth weight associated with maternal smoking have neuro-behavioural consequences among those who are not born prematurely or of substantially low birth weight.

Children whose mothers smoked during pregnancy have consistently demonstrated higher rates of behaviour problems than those not exposed. Olds notes in his 1997 paper³⁸ that 10 out of 11 human studies reviewed found increased rates of child behaviour problems and attention deficit/hyperactivity disorder-like behaviours, even after controlling for many potential confounders. These studies included samples from the newborn period up through adolescence.

An increased chance of perinatal mortality, including Sudden Infant Death Syndrome (SIDS), has been noted with prenatal exposure to tobacco smoke.^{39, 40} Although the effect of maternal smoking during pregnancy on offspring behaviour is relatively well studied, less is known about the long-term effects such smoking has on child neuro-cognitive functioning. Several studies have found reductions in IQ scores in children born to women who smoked in pregnancy, although these results are not uniform.⁴¹

Alcohol

There is some evidence that even ‘moderate’ alcohol consumption by mothers during pregnancy can have adverse effects on the unborn child. The 2001 Australian Alcohol Guidelines⁴² were based on a systematic review of the international literature that concluded that maternal consumption of fewer than

seven drinks per week, and fewer than three drinks on any one day, was not associated with significant risk.

Maternal alcohol dependence and frequent high-risk alcohol consumption can cause foetal alcohol syndrome (FAS).

In infancy, FAS is elucidated by:

- intrauterine growth retardation, with persistent postnatal poor growth in weight or height;
- a pattern of specific minor physical anomalies that include a characteristic facial appearance; and
- central nervous system deficits including microcephaly, delayed development, hyperactivity, attention deficits, intellectual delays, learning disabilities and, in some cases, seizures.⁴³

FAS infants also have a 3.5 times elevated mortality rate.⁴⁴

Even in the absence of FAS, infants born to alcohol dependent mothers show an increased incidence of intellectual impairments, congenital anomalies and decreased birth weight.⁴⁵

Many studies have identified delayed development in the first two to three years of life for children exposed to significant prenatal alcohol use^{46–48} and some studies have followed up such children for longer periods. By age 7, lower IQ scores, reading, spelling, arithmetic, higher rates of retardation, differences in height, weight, and head circumference,⁴⁹ and behaviour problems have been observed.⁴⁵ Similar behavioural problems and impairments in concentration and attention are being described for adolescents and young adults.⁴⁹

Research in this area has been hampered by poor measurement of levels of alcohol and other drug use. It is also likely that pregnant women do not always provide reliable self-reports of drug use when participating in these studies.

Cannabis

There are theoretical reasons for expecting adverse effects of heavy maternal cannabis use on foetal growth, but there is limited and inconclusive evidence that this occurs.⁵⁰ During pregnancy, maternal cannabis effects in animals and humans have been documented on pituitary ovarian function, prolactin secretion and uterine contractility.⁵¹ However, no relation has been documented between cannabis use and length of

gestation or birth weight.⁵² Birth weight reductions have been associated with cannabis use in descriptions of those studying higher risk, lower income families but the results are conflicting.⁵³

A few studies have suggested a link between prenatal cannabis exposure and features similar to foetal alcohol syndrome,^{54, 55} but the separate effects of cannabis use and heavy alcohol consumption have not been determined.⁵² Several neuro-behavioural findings in the newborn period point to decreased responsiveness, on visual responsiveness to animate and inanimate stimulation, and a higher pitched cry.^{52, 56, 57} Other characteristics of newborns exposed to heavy maternal cannabis use are tremors and increased startle in the first seven to 14 days of life.⁵⁸ Changes in sleep patterns have also been reported including a decrease in quiet sleep, and lower sleep efficiency and maintenance as measured by sleep EEG, as late as three years of age.^{59, 60}

Frequent maternal cannabis use may be a weak risk factor for Sudden Infant Death Syndrome but this finding requires further research.⁶¹ One early review concluded that the smoking of cannabis during pregnancy was sometimes associated with a significantly increased risk of placental abruption and a decrease in birth weight.⁶²

Cocaine

There is a considerable US literature relevant to the impact of maternal cocaine use on child development. Infants exposed prenatally to cocaine, however, are also exposed to a number of other risk factors⁶³ such as maternal use of other drugs, health problems including a higher incidence of HIV with or without AIDS-related illnesses, complicated deliveries and intrauterine growth retardation. Postnatally, infants exposed to cocaine continue to be exposed to ongoing parental substance problems, they are more often neglected and abused, and they have parents with more frequent depression and higher overall stress and anxiety.⁶⁴ Any one of these factors may influence the development of early attentional and arousal regulatory functions, later language, and potentially overall developmental competency.⁶⁵ There are suggestive findings which point to impairments in more basic neuro-developmental domains of attention and arousal regulation, functions that underlie learning and information processing.⁶⁵

Animal studies show that cocaine administration during pregnancy results in major maternal cardiovascular effects and that some of these effects are enhanced in pregnancy.⁶⁶

Singer et al.⁶⁷ in their review conclude that current studies are inconclusive but suggest that prenatal exposure to cocaine can have significant effects on the growth and neurological development of the infant, with the potential for later learning and behavioral disabilities. Social-environmental correlates of maternal cocaine use are confounding factors with known negative effects on child outcome. Neuspiel⁶⁸ and Mayes⁶³ caution that over estimating the risks of intrauterine cocaine exposure can have negative effects, including unnecessary termination of pregnancy and labelling of cocaine-exposed children to create a self-fulfilling prophecy of later developmental problems.

Heroin

Infants exposed significantly *in utero* to opiates (heroin or methadone) may exhibit withdrawal symptoms in the first days to weeks after delivery.⁶⁹ Numerous studies have now replicated the findings that such exposure reduces birth weight and head circumference.⁷⁰⁻⁷² Similar findings in animal models that control for exposure to other drugs such as alcohol or tobacco and for poor maternal health support the finding of an opiate effect on foetal growth.⁷³ Prenatal exposure to opiates also contributes to as much as an eight-fold incidence of sudden infant death syndrome (SIDS).^{71, 74}

The dramatic neuro-behavioural abnormalities seen in the newborn period generally diminish over the first month of life⁷⁵ for the majority of infants and are thus assumed to reflect transitory opiate withdrawal rather than evidence of permanent neurological dysfunction.⁷¹ Past the neonatal period, a number of studies have documented small and not usually significant delays in acquisition of developmental skills.^{65, 76} However, much more consistent and significant across studies have been the findings of persistent problems in poor motor coordination, high activity level and limited attention span among opiate-exposed infants in the first year of life.^{77, 78} These state and motor regulatory difficulties make it especially hard for a parent to provide appropriate care for the infant, especially for parents with their own state and attentional problems.⁷¹

Follow-up studies through early childhood of opiate-exposed compared with non-opiate-exposed children have continued to report few to no differences in cognitive performance.⁶⁵ However, opiate-exposed school aged children show higher activity levels, are often impulsive with poor self-control, show poor motor coordination, and have more difficulty with tasks requiring focused attention. There is also an increased incidence of

attention deficit disorder among opiate-exposed school aged children.⁷¹

Past the years of early childhood, there are few studies of the long-term effects of prenatal opiate exposure, and those available usually lack a non-exposed control group or are not based on longitudinal designs.⁷¹ The data from these studies suggest that by adolescence, opiate-exposed children exhibit an increased incidence of behaviour and conduct problems including impulsivity, involvement in criminal activities, heavy drug use, more antisocial behaviour, and increased school dropout.⁷⁹⁻⁸¹ It is altogether not clear how much these problems in conduct and impulse regulation are attributable to persistent effects of prenatal opiate exposure, and how much they are the consequence of cumulative exposure to the discord and dysfunction often characterising households with substance use problems.

3.2.2 Breast-feeding and cannabis use

Postnatally, cannabis has been identified in the urine of breast-fed infants whose mothers continue to use after delivery.⁸² However, no acute toxic effects have been identified with this level of passive exposure although a few studies suggest possible developmental effects related to heavy postpartum exposure via breast milk.⁵⁰ In one study, cannabis exposure via breast milk in the first postpartum month was related to decreased motor development at one year, and there appeared to be a dose-related pattern to the level of association between exposure and motor delay.⁸³ However, longer term studies of the outcomes of prenatal cannabis exposure are few in number and there is a paucity of long-term follow-up studies. The few findings make it difficult to conclude whether or not prenatal cannabis exposure has a direct effect on later developmental functions such as memory.⁶⁵

3.2.3 Children whose parents have drug problems

Families, in particular those with drug-using parents, have received considerable attention from health providers and researchers in recent years. Children living with a substance-abusing or substance-dependent parent suffer physical, psychological and emotional abuse to a greater extent and more often than children whose parents do not abuse substances.⁸⁴⁻⁸⁶ Angus and Hall reported that in 1994/5, approximately 22% of emotional abuse cases in NSW were the result of a parent's substance misuse.⁸⁷

It is widely assumed that parents affected by substance use provide their children with less than optimal care.⁸⁸ Women's use of alcohol or other drugs is strongly dissonant with cultural ideals of motherhood and is highly stigmatised by society.⁸⁹ There has been only a very limited body of research that has focused on the study of substance misusers as parents. These studies suggest that many such parents provide adequate care of their children⁹¹ and that substance-abusing parents may have active strategies to protect their children from the risks of their lifestyles.⁹² However, they also suggest that substance-misusing parents provide poorer quality care than other parents. Several outcome measures have been used to measure parenting, ranging from gross indicators of child maltreatment to more subtle aspects of parent-child interaction. The mechanisms by which parenting is challenged or compromised when human mothers are drug dependent are not fully understood.⁸⁸ It is unclear whether parenting is directly impaired by substance use or undermined by other factors such as poverty, lack of education or poor mental health.

Evidence of the moderating effects of environment on the development of children prenatally exposed to alcohol and other drugs is scant. Hans⁷⁶ found that differences between the development of children prenatally exposed to methadone and comparison children were only expressed in children being reared in the most impoverished circumstances and environments. In a related line of research on the effects of lead, Bellinger⁹³ has also demonstrated different patterns of teratologic effects depending on social class.

One view of moderating effects is that postnatal interaction and environmental conditions may enable recovery from a prenatal insult.⁹⁴ A second view is that prenatal exposure does not necessarily lead to behavioural changes but rather causes vulnerabilities to other risk factors. Hans⁷⁶ chose to interpret her data in this way: that prenatally-exposed children were more vulnerable to conditions of extreme poverty than other children not exposed in utero.

3.2.4 Effects of passive smoking on children

Passive smoking, or the inhalation of environmental tobacco smoke (ETS), is known to have harmful effects. Smoking by parents increases the risk of a variety of diseases in their children.⁹⁵ Exposure to ETS during early life is associated with many adverse health outcomes including infant mortality,⁹⁶ respiratory illnesses such as bronchitis, wheezy

bronchitis and pneumonia,⁹⁷⁻¹⁰⁰ middle ear effusion (glue ear),¹⁰¹ Sudden Infant Death Syndrome,^{102, 103} reduced ventilatory function^{98, 104} and shorter stature.^{105, 106} Importantly, a number of studies suggest that the effects of parental smoking on a child's health may have long-term consequences. Middle ear effusion during infancy, for example, may impact on later linguistic and cognitive development^{106, 107} and lower respiratory tract illness in early childhood may predispose for chronic obstructive pulmonary disease in later life.^{98, 108, 109} Further, in addition to the short- and long-term physiological damage caused to infants and children by ETS, the chances are increased that offspring exposed to parents who smoke may themselves take up smoking in adolescence or adulthood.¹¹⁰⁻¹¹² Doll has argued that exposure to ETS increases the risk of lung cancer later in life, probably exacerbates chronic obstructive lung disease, and may increase the risk of ischaemic heart disease.¹¹³

It has been estimated that each year, passive smoking causes 46 500 cases of asthma in Australian children, and causes lower respiratory tract illness in 16 300 children.¹¹⁴

The magnitude of the effects of children's tobacco exposure on adverse behavioural and neuro-cognitive effects is not entirely clear, but is estimated to involve a deficit of four to five IQ points and an odds ratio of 1.5. These decrements are of concern in that their negative impact tends to accumulate over the course of development.

3.3 Patterns of drug use and harm among adolescents

Data are available from regular national surveys for secondary school students aged 12 to 17 years up to 1999 and from the NDSHS for 14 to 19 year olds up to 2001. Table 3.1 summarises the most current estimates of the prevalence of different patterns of drug use. The main features are that teenage girls are more likely to be regular smokers and risky or high-risk drinkers than are their male counterparts, though levels of use defined as risky for women are lower than for men. Slightly more teenage males report having used cannabis in the past 12 months, which is by far the most commonly used illicit drug. Other levels of drug use are similar between the sexes. Apart from cannabis, the only illicit drugs used with any frequency by this age group are amphetamines and ecstasy. 'Recent use' for illicit drugs in the NDSHS is defined as any use in the last 12 months, so the figures do not distinguish between occasional, experimental use and more regular, intense patterns.

Table 3.1 Prevalence of different drug-using patterns in Australians aged between 14 and 19 years: NDSHS 2001²²

Substance/behaviour	Males aged 14 to 19 %	Females aged 14 to 19 %
Tobacco		
Regular smoker	14.1	16.2
Occasional smoker (weekly or less)	6.1	4.4
Ex-smoker	4.0	4.7
Never smoked	75.9	74.7
Alcohol		
Current drinker	72.8	74.7
Risky/high-risk drinker for long-term harm	8.8	14.6
Risky/high-risk drinker for short-term harm at least monthly	29.4	33.0
Illicit drugs used in last 12 months		
At least one illicit drug (including cannabis and misused pharmaceuticals)	28.8	26.6
Cannabis	26.6	22.6
Amphetamines	5.7	6.8
Ecstasy	5.7	4.3
Injecting drugs	0.6	0.6
Heroin	0.4	0.4

The large sample size and standard format over time of the National Secondary School Drug Surveys (NSSDS) permits detailed breakdowns and some trend analyses for use of drugs by this age group. Table 3.2 shows breakdowns for illegal drugs by age and sex, with a comparison of overall changes between 1996 and 1999.

Main features are that:

- with the exception of inhalants and steroids (perhaps reported unreliably by younger children) there are dramatic increases in levels of illicit drug use from 12 to 17 years of age;
- with the exception of tranquilisers, males are more likely to use these drugs than females; and
- cannabis has been tried by about half of all 17 year olds but its use has declined since 1996.

Table 3.2 Prevalence of illegal drugs ever used by 12 to 17 year olds¹⁵ (with change in % estimates since 1996)

Substance or behaviour	% ever used Age 12 years		% ever used Age 17 years		Change in % for all ages 1996 to 1999	
	M	F	M	F	M	F
Cannabis	11.1	7.1	53.1	46.4	-7.9	-6.6
Amphetamines	3.6	1.9	13.0	11.3	+0.6	+1.3
Hallucinogens	2.5	1.8	14.8	9.4	-2.5	-1.4
Ecstasy	3.5	1.0	7.2	4.9	+0.2	+0.5
Painkillers/analgesics	94.4	96.4	95.8	98.6	-1.6	-0.7
Cocaine	2.6	1.7	6.2	2.4	-0.5	+0.4
Tranquillisers*	15.7	11.4	22.1	22.3	-0.4	-2.1
Inhalants	32.3	33.7	17.2	14.4	+0.6	+0.6
Opiates	3.2	1.7	6.6	3.9	-0.2	+0.5
Steroids*	3.8	2.8	2.9	0.9	+1.0	+0.9

* For non-medical purposes i.e. without prescription

The restricted time window of 'use in last month' is likely to give a more realistic sense of more regular patterns of drug use. These are summarised for the 1999 NSSDS in Table 3.3. These data again confirm the pattern of dramatic increases in levels of drug use during the teenage years for all drugs other than inhalants and analgesics. Putting aside the risks associated with commonly available painkillers, it is clear that alcohol, tobacco, cannabis and, to a lesser extent, amphetamines are the only drugs used with any significant frequency.

Table 3.3 Prevalence of drug use in last month for 12/13 and 16/17 year olds¹¹⁵

Substance or behaviour	% used last month Age 12/13	% used last month Age 16/17
Alcohol	31	70
Tobacco	12	33
Cannabis	6	20
Amphetamines	4	11
Hallucinogens	1	3
Ecstasy	2	4
Painkillers/analgesics	67	75
Cocaine	1	1
Tranquillisers*	3	5
Inhalants	16	4
Opiates	1	1
Steroids*	1	1

* For non-medical purposes i.e. without prescription

Trend data from the NSSDS, between 1983 and 1996, show significant increases in alcohol use including frequency and quantity consumed by the Australian youth population through the 1990s, after a small decline in the late 1980s. This trend continued between 1996 and 1999 with an increase in the proportion of students reporting drinking alcohol in the week before the survey. Inspection of trends demonstrated that the prevalence of students drinking in the previous week at ages 12 to 15 tended to increase through the 1990s, while both this indicator and drinking large (potentially harmful) amounts of alcohol also increased for students aged 16 to 17 years.¹¹⁶ The Australian trend of increasing youth alcohol use through the late 1990s has also been reported in Canada and the United States.¹¹⁶

3.4 Longitudinal patterns of use from adolescence to adulthood

Although there is little information, available data suggest that inhalant use may peak in early adolescence and may be more common in youth populations at risk for subsequent drug abuse. In one of the few longitudinal studies, inhalant use by age 16 was found to be a unique predictor of heroin use by age 32.¹¹⁷

Adolescence is an important period in the development of drug use. In this section, follow-up research studies are examined to explore the relationship between earlier and later patterns of drug use in adolescence. Appendices A, B and C summarise the follow-up studies that are examined in this section.

Tobacco

Evidence from two cohorts demonstrates that tobacco use in early adolescence predicts later tobacco dependence and daily smoking,^{118, 119} after adjusting for other influences.

The relationship between adolescent tobacco use and the development of alcohol use has been examined in four separate cohorts. The available longitudinal evidence is slim but does not support the view that tobacco use in adolescence leads to increased alcohol use or alcohol use problems. Three cohorts have examined the possibility that frequent and dependent tobacco use at ages 17 to 18 leads to subsequent alcohol use problems at ages 21 to 25. In general, the evidence does not support this proposed relationship.^{120, 121} McGee *et al.* reported a relationship but this was not adjusted for other influences.¹²²

Evidence from three of four cohorts suggests that adolescent tobacco use leads to cannabis use. After adjusting for other factors, tobacco use at age 15 was shown in two studies to predict cannabis use at around ages 17 to 18.^{122, 123} In the Los Angeles cohort after controlling for the influence on poly-drug use, frequent tobacco use at age 17 tended to lead to frequent cannabis use at age 21.¹²⁴ However, in a New York cohort early tobacco use did not lead to later cannabis use.¹²¹

Alcohol

Work from eight cohorts has examined the influence of alcohol use in childhood and adolescence on the subsequent development of harmful alcohol use. Evidence suggests that earlier initiation to alcohol use is related to more frequent and higher quantity alcohol consumption in

adolescence, and these patterns are in turn related to the development of alcohol-related harms in adolescence and adulthood. In the New Zealand Christchurch cohort, after controlling for other known risk factors, early age alcohol initiation (prior to age 6) led, at age 15, to more frequent, higher quantity and more harmful alcohol use.¹²⁵ In a Black-American sample with a high number of risk factors, early age use was also associated with more alcohol use at age 15, but these analyses were not adjusted.¹²⁶ Costello *et al.* did not find age of alcohol initiation predicted alcohol dependence at age 16.¹¹⁸ In two cohorts, patterns of frequent alcohol use were examined with controls for poly-drug use. In the Boston cohort, Guy *et al.* report that frequent alcohol use at age 14 (without poly-drug use) led to problems with alcohol at age 26.¹²⁷ In Los Angeles in the 1980s, Newcomb and Bentler also found that a similar pattern of alcohol use at age 17 linked to alcohol and cannabis problems at age 25.¹²⁴ Both the frequency and amount of alcohol use in adolescence appears to predict alcohol problems in early adulthood. In analysis of the NZ Christchurch cohort the amount of alcohol used at age 18 predicted age 21 alcohol harms, after controlling for gender, sociodemographic differences, exposure to drinking environments, and prior alcohol use.¹²⁸ In the same cohort, use at age 18 predicted dependence at age 21, but adjusted analyses were not reported.¹²² In the Seattle cohort, frequent alcohol use measured from age 14 or 16 predicted alcohol abuse and dependence combined, and also alcohol dependence, at age 21.¹²⁹ In the same cohort, trajectories of binge drinking from 13 to 18 also predicted alcohol abuse and dependence at age 21.¹³⁰

Four cohorts have examined whether alcohol use increases tobacco use. In most cases involvement in alcohol use has been shown to increase subsequent involvement in tobacco use, but at this stage the three cohorts where this effect has been observed^{120, 121, 131} were not controlled for known confounders. In the Los Angeles cohort, frequent alcohol use (without poly-drug use) at age 17 did not predict tobacco use, after controlling for other factors.¹²⁴

Evidence is accumulating that early involvement in alcohol use may predict subsequent cannabis use. These findings have been demonstrated in unadjusted analyses in New York,¹²¹ in an American Indian and Black American cohort¹³¹ and in the New Zealand Dunedin cohort.^{122, 132} In the Los Angeles cohort, no significant influence for age 14 frequent alcohol use (adjusted for poly-drug use) was reported for frequent cannabis use at age 21, after adjustment for other risk factors.¹²⁴ In the Victorian

Adolescent Health Cohort (VAHC) both the frequency and quantity of alcohol consumed at age 14 predicted frequent cannabis use at age 15, and for females the amount consumed at age 14 predicted daily use at 16 to 17. These effects applied after controlling for smoking and other risk factors.¹²³

Prediction of illicit drug use from prior adolescent alcohol use has been the focus in three cohorts. The available evidence suggests that alcohol is not a direct predictor. Kandel observed that earlier use of alcohol was associated with a higher likelihood of subsequent illicit drug use and use of psychoactive pharmaceuticals in early adulthood.¹²¹ A similar relationship was observed in the Chicago, Woodlawn cohort.¹¹⁷ However, in the Chicago study this effect was no longer significant once the impact of social disadvantage, other drug use and inadequate education were considered.¹¹⁷ In the Los Angeles cohort neither the effect of frequent alcohol use at age 13¹³³ on illicit drug use at 21/22 or the effect of frequent alcohol use at 17¹²⁴ on illicit drug use problems at age 25 were significant after factoring in poly-drug use and other risk factors.

Cannabis

Evidence from five cohorts suggests that cannabis use in early adolescence leads to more frequent cannabis use¹²³ and to problems with cannabis and/or alcohol.¹²⁴ Evidence from four cohorts suggests that cannabis use does not predict harmful alcohol use. Three cohorts have examined whether cannabis use leads to tobacco use and again the evidence does not support a direct link. Evidence from five cohorts supports the view that cannabis use in early adolescence leads to illicit drug use. Work in the Los Angeles cohort suggests the effect may occur particularly through poly-drug use.^{124, 133} But in the Chicago cohort the effect was maintained after adjusting for other drug use. Although adolescent cannabis use is predictive of subsequent illicit drug use, it is not all-determining. Findings from the Australian Temperament Project revealed that of those using cannabis at age 13 approximately 10% reported illicit drug use at age 15.⁴⁶¹

Poly-drug use

Findings from a number of follow-up studies suggest that poly-drug use in adolescence is a major factor leading to subsequent drug-related harms. In work using structural equation modelling, the frequency of different forms of adolescent drug use has been typically found to be linked through an underlying association with poly-drug use and typically this pattern of drug use is stable^{124, 135, 136}

and predictive of drug-related harm in adulthood.^{127, 133, 137} Early involvement in poly-drug use is a marker of risk for later drug use problems. At age 13 approximately 9% of the Australian Temperament Project cohort were engaged in poly-drug use and this pattern was predictive of more serious substance use at age 15.⁴⁶¹ Williams *et al.* noted that ‘taking any particular drug (by 15) significantly increases the likelihood of taking another type of drug’ (p26),⁴⁶¹ while use of three or more different drug types was less common. Structural equation approaches typically find a latent factor measuring early adolescent poly-drug use (ages 13/14) to be an important and unique predictor of drug use problems and other adjustment difficulties at age 21/22^{133, 136, 138} and 25/26.¹²⁷ Preventing poly-drug use appears to be an important goal for reducing drug-related harm.

3.5 Longitudinal patterns of harm from adolescent drug use

3.5.1 Tobacco

Tobacco has acute effects in children and adolescents that are often overlooked. A relationship between respiratory symptoms and smoking has been found in primary school students¹³⁹ and smoking-related respiratory problems may become apparent within weeks of beginning to smoke.¹⁴⁰ Adolescent smokers cough more than non-smokers of the same age.¹⁴¹ They are more likely to develop respiratory tract infections than non-smokers,¹⁴² more likely to experience shortness of breath with exertion,¹⁴⁰ and have more asthma and allergy symptoms.¹⁴³

Appendix A summarises follow-up research studies relevant to the consequences of different forms of adolescent tobacco behaviour for subsequent development. Across the 11 cohorts 41 analyses were reported. The main consequences measured were effects on later drug use, and health and mental health. The developmental consequences of adolescent tobacco use for subsequent patterns of drug use are summarised above, demonstrating that adolescent tobacco use increases the risk of tobacco dependence. A broader review of risk and protective factors for later adolescent substance use is provided in Chapter 6. Among these risk and protective factors are included parental and peer alcohol, smoking and other drug use.

The available follow-up studies reveal that adolescent tobacco use increases the risk of subsequent health problems in early adulthood. This issue has been addressed in two cohorts and

both cases refer to the effects of early tobacco use after controlling for the contribution of poly-drug use. In a Boston cohort, frequent tobacco use at age 14 predicted respiratory problems by age 26.¹²⁷ In a Los Angeles cohort, frequent tobacco use at age 14 was associated with health problems at age 22.¹³³

Results from four out of five cohorts suggest that youth tobacco use may predict subsequent mental health problems. In the Los Angeles cohort, frequent tobacco use at age 14 (that was not occurring with poly-drug use) predicted emotional distress and psychosomatic problems at age 22.¹³³ In the Dunedin cohort, those using tobacco on a daily basis by age 15 were more likely to have mental health problems at age 18, after controlling for other factors.¹²² In a follow-up of a small (N = 133) New York cohort, youth tobacco use from 13 to 16 increased the risk of difficult temperament characteristics (such as negative emotions) emerging at age 21.¹⁴⁴ Analyses with a cohort in North Carolina have linked frequent tobacco use at age 16 with the emergence of anti-social personality disorders and major depression, but not anxiety disorders, at age 22.¹³⁸ These analyses adjusted for prior psychiatric symptoms. The Boston cohort was the only analysis where age 14 frequent tobacco use did not predict mental health problems at age 26, after adjusting for other relationships. This analysis was based on structural equation modelling and found that the pathway to age 26 ‘psychiatric distress’ was better explained by peer and self-reported socialisation at age 14.

The possibility that youth involvement in tobacco use leads to social problems arises from one cohort. In analyses with the Los Angeles cohort, Newcomb and Bentler reported that frequent tobacco use (without poly-drug use) at age 14 led to social problems at age 22.¹³³ A further analysis of the same cohort found that frequent tobacco use combined with alcohol use at age 18 led to increases in general deviancy at age 22.¹⁴⁵

Relevant prevention targets for adolescent tobacco use include preventing youth initiation of tobacco use and encouraging tobacco users to quit.¹⁴⁶

3.5.2 Alcohol

The research examining the consequences of adolescent alcohol use for the development of more extreme alcohol use behaviours, and also for tobacco use, illicit drug use and cannabis use are summarised above. In this section the consequences of adolescent alcohol for mental health, health and social problems are explored (see Appendix B).

The development of mental health problems has been examined in eight cohorts and the evidence does not support a direct link with anxiety or depressive illness. Both the Boston cohort¹²⁷ and the Los Angeles study¹³³ have examined the effect of frequent alcohol use at ages 13 to 14 and found no significant effect on mental health problems at ages 22 or 26 respectively. The cohort of Black Americans and Indians¹³¹ showed an increased level of psychiatric diagnoses for those using alcohol at earlier ages and the Dunedin cohort¹²² also manifested a greater level of mental health problems at age 18 for those drinking at age 15, though in the Dunedin cohort this effect no longer applied after considering the effect of family climate, earlier behaviour problems and smoking. Neither the Dunedin cohort¹²² nor a study of children of alcoholics¹⁴⁷ found that alcohol influenced anxiety disorders. After adjustment for other factors, neither the Seattle cohort¹³⁰ nor the Upper New York counties study¹³⁸ found any impact on depression. However, the New York counties study did find an effect for those reporting 'heavy' alcohol use at age 16 to have higher diagnoses of both anxiety disorders and antisocial personality disorders by age 22 and this applied after considering prior mental health and substance use status.¹³⁸

The role of alcohol in the development of criminal and delinquent behaviour has been examined in three cohorts and findings suggest that frequent alcohol use around the ages 15 to 18 may increase the risk of entry to delinquency and crime. In the Seattle cohort, binge drinking from 13 to 18 did not tend to predict entry to crime by age 21, after controlling for a range of risk factors.¹³⁰ In the Christchurch cohort, the quantity and frequency of alcohol consumed at age 15 did predict entry to property crime at age 16¹⁴⁸ and the emergence of violent crime,¹⁴⁸ after appropriate control for a range of risk factors. In the Los Angeles cohort, the frequency of alcohol use at age 17 also tended to demonstrate unique pathways to general deviance at age 22.¹⁴⁵

In two cohorts, outcomes relevant to education have been examined and findings are inconclusive. In the Seattle cohort, binge drinking from 13 to 18 influenced high school retention, after controlling for other risk factors.¹³⁰ Frequent alcohol use from 11 to 15 did not influence attitudes to school, after controlling for other predictors.¹⁴⁹

In the Los Angeles cohort,¹³³ a pathway was observed from more frequent alcohol use without poly-drug use at age 13 to more social relationships and romantic attachments at age 22. One study

conducted in Oslo observed that female alcohol use at age 13 increased the incidence of subsequent experiences of sexual victimisation, but the extent to which this finding was due to other underlying risk processes was not examined.¹⁵⁰

Heale *et al.* used data from the 1998 NDSHS to estimate the proportion of alcohol users in Australia drinking in patterns that are likely to risk harm.¹⁵¹ The analysis revealed for young adults (18 to 24 years) 90% of all alcohol was consumed in high-risk patterns, primarily due to drinking in ways which placed the drinker at risk of acute harm. The elevated rate of high-risk drinking in the young adult age group is due to young people being more likely to drink a large amount of alcohol in a short space of time, typically on weekends.¹⁵² This is a reason why young people are more likely to experience acute harm and less likely to experience chronic harm. These drinking patterns are reflected in the types of harm, which typically includes drink driving and violence.

Findings suggest that prevention targets might include delaying the age of first alcohol use. Before this target receives widespread support, further evidence will be needed in the Australian context. Currently, many parents appear unconvinced that earlier age of alcohol use does lead to harms as parents are the main source for early adolescents to obtain alcohol.¹⁵³ Efforts in Australia to teach young people strategies to minimise harms and avoid risks associated with alcohol show some evidence for success. Such strategies, in concert with other public health initiatives, have been associated with reductions in alcohol-related road deaths¹⁵⁴ and reductions in levels of youth alcohol use.¹⁵⁵ Maintaining prevention targets aimed at minimising or reducing risky alcohol use would appear warranted. Intervention research may be warranted to establish the relative merits of use reduction versus harm reduction approaches to the prevention of alcohol-related harm in adolescents.

3.5.3 Cannabis

A number of follow-up research studies have examined the consequences of adolescent cannabis use for the development of later drug use behaviours, and also for mental health and health and social consequences (see Appendix C).

Two US studies have found conflicting results in regard to later health problems as a result of adolescent cannabis use. Within the Boston cohort, no effect was found between frequent (not poly-

drug) adolescent cannabis use and health problems in the early twenties; however, within the Los Angeles cohort, a significant relationship was found.

Several recent studies have documented a relationship between adolescent cannabis use and later mental health problems; however, the evidence is not consistent across studies. An early finding of relevance was the small study by Lerner and Vicary where cannabis use from ages 13 to 19 predicted increasing levels of difficult temperament.¹⁴⁴ In the Brook and colleagues New York State cohort, heavier cannabis use at age 16 predicted personality disorder at age 22, after controlling for initial mental health status.¹³⁸ However, in the same cohort, no effect on anxiety or depression was noted. In the New Zealand Dunedin cohort, cannabis use at age 18 increased the risk of mental disorder at 21 (although from age 15 to 18 mental disorder increased the risk of cannabis use).¹²² In the Christchurch cohort, frequent cannabis use at ages 15 to 16 did predict later major depression (but not anxiety or suicide attempts) at ages 17 to 18, after adjusting for a range of risk factors.¹⁵⁶ Adolescent cannabis use has also been linked with the subsequent development of psychotic symptoms in the Christchurch cohort.^{157, 158} No independent (adjusted) effect was found between frequent cannabis use in early adolescence (13 to 14 years) and mental health symptoms in early adulthood (21 to 25 years) within either the Los Angeles¹³³ or Boston¹²⁷ cohorts, when the influence of cannabis use without poly-drug use was examined.

The available longitudinal research indicates that adolescent cannabis use is related to various social problems in late adolescence/early adulthood. For example, a significant relationship was found between cannabis use at age 15 to 16 years and early school drop out, unemployment, violent offending and property offending at ages 17 to 18 years, within the Christchurch cohort.^{156, 159} These results are consistent with a South East US cohort where earlier age cannabis use was associated with school drop out by age 18 years.¹⁶⁰ Within the Los Angeles cohort, family problems at age 22 were also found to be exacerbated by cannabis use in early adolescence.¹³³ A separate analysis of the Christchurch cohort found a significant effect within a shorter time frame between cannabis use at age 15 and school dropout and police contact by age 16. However, once these findings were adjusted to control for other factors including peer relationships, social disadvantage and childhood behaviour problems, effects tended to disappear.¹⁵⁹

In their review, Lynskey and Hall noted that early cannabis use consistently predicted poor school performance and non-completion of high school. They argued that this effect was not due directly to the influence of cannabis on motivation or cognitive ability but acted through prior risk factors and affiliation with low achieving peer groups.¹⁶¹

Many of the harmful consequences have been associated with earlier age use and frequent use in adolescence. Hence targets for reducing harm associated with adolescent cannabis use might include preventing youth initiation to cannabis use, reducing the number who progress to regular use and encouraging regular users to use less frequently.

3.5.4 Cocaine

Although the specific developmental effects of cocaine use in adolescence have not been widely studied, a number of US follow-up studies have examined the developmental implications of adolescent illicit drug use and in many of these studies cocaine has been prominent. These studies reveal that illicit drug use initiated in early adolescence tends to be very stable¹⁶²⁻¹⁶⁴ and predictive of the subsequent emergence of drug-related harms¹²⁷ and problems associated with mental health,^{133, 138} crime¹⁶² and social relationships.¹³³

In small amounts cocaine causes euphoria and feelings of energy. Used repeatedly, adverse effects can include agitation, anxiety, paranoia, hallucinations, dizziness, nausea and vomiting, tremors and aggression.¹⁶⁵ Prolonged use leads to tolerance and bingeing which is followed by periods of intense depression, lethargy, and hunger. Cocaine smokers may experience lung problems, while injectors risk BBVs (see injecting, page 30). Repeated inhaling damages the nasal lining and the structure separating the nostrils.¹⁶⁵

Cocaine can be fatal in large doses although it is nowhere near as toxic as opioids.¹⁶⁶ Cocaine overdose is associated with cardiovascular incidents such as cardiac arrest and cerebral vascular accidents. It was estimated that it was responsible for four deaths in Australia in 1998, along with 78 Person Years of Life Lost (PYLL) and 59 hospital episodes.¹⁶⁷ In the US, the combination of cocaine and alcohol has been found to be a factor in cocaine-related deaths but research is needed to ascertain whether this is a factor in Australian cocaine-related deaths.¹⁶⁸

Both smokers and injectors are more likely to develop dependence than those who sniff or snort the drug. Dependence on cocaine is associated with significantly higher levels of physical and mental harm, higher levels of criminality and unemployment, along with lower levels of general social functioning.¹⁶⁹

In the United States, where cocaine use is far more common than in Australia, it has been found that cocaine use is associated with high rates of anxiety disorders and affective disorders.¹⁶⁶ In a Sydney study, 31% of surveyed non-injecting cocaine users reported experiencing psychological problems including depression, anxiety and paranoia as a result of their cocaine use.¹⁷⁰ As with amphetamine-type stimulants (ATS), prolonged bingeing on cocaine can result in a transient but severe paranoid psychosis.¹⁶⁶

CHAPTER 4: PATTERNS OF DRUG USE, RISK AND HARM IN THE GENERAL POPULATION AND SUB-POPULATIONS

4

4.1 Summary

Alcohol and other drug use substantially contribute to death, injury, illness, crime, mental health and social problems both to drug users and the wider community. A broad range of preventable harm and patterns of drug use need to be considered in determining priorities for prevention policy. Understanding the underlying patterns of risky drug use is also a pre-requisite for designing effective interventions.

Drug use is associated with high legal and social costs to communities and families. There are major economic costs caused by the lost productivity resulting from drug-related deaths. The most significant drug in regard to road trauma is alcohol. Crime is strongly associated with alcohol and drug use, particularly alcohol with violence and heroin with property crime.

Tobacco and alcohol use contribute the great bulk of preventable health problems associated with drug use. Although regular tobacco use continues to decline, it is responsible for the highest levels of mortality and morbidity of any drug, primarily due to cancers affecting older people. Alcohol represents the second largest contribution to drug-related harm. Unlike tobacco, a dependent pattern of use does not contribute the most harms at a population level: the short-term effects generate the most years of life lost (e.g. from injury and poisoning) while the long-term effects of regular heavy use result in the more premature deaths among mostly older people. The main causes of alcohol-related deaths are cancer, alcoholic liver cirrhosis and road trauma.

While tobacco use continues to decline, risky alcohol use remains common (particularly among young adults) and overall consumption of alcohol has increased in recent years. Most alcohol consumed in Australia is not drunk within Australian Alcohol Guidelines for low-risk use.

Despite illicit drug use being under-estimated by population-based surveys, as many as 38% of Australians over the age of 15 admitted they had tried an illicit drug in 2001. Cannabis continues to be the most commonly used illicit drug in Australia, followed by amphetamine type stimulants (ATS), the use of which has been increasing recently. Lifetime use of drugs believed to be 'ecstasy' was reported by 6% of adults. Heroin has recently decreased in availability and was reported to be used by only 1.6% of the adult population in 2001.

The major health problems caused by the use of illicit drugs are connected with injection, either through an opiate overdose or the transmission of blood-borne viruses. Injecting drugs is also associated with the development of dependence. A marked drop in heroin overdose has occurred since 2000, though this follows a 55-fold increase between 1964 and 1997. Major risks for opiate overdose are injecting after a period of abstinence and use in association with other CNS depressant drugs, especially benzodiazepines and alcohol. While a rate of HIV infection of 2% among injecting drug users (IDUs) is among the lowest of any country, hepatitis C is a major concern and is present in two-thirds of Australians who have injected for six years or longer. Many sufferers go on to develop liver cirrhosis with often fatal consequences.

A handful of ecstasy-related deaths have been reported, most commonly from hyperthermia. There is little evidence that steroids are a significant public health concern.

Rates of substance use are strikingly higher in persons diagnosed with mental health disorders. There is growing evidence that heavy and dependent alcohol use can cause, as well as be in response to, mental problems. Most authoritative reviews conclude that cannabis can only exacerbate symptoms and precipitate psychotic episodes in vulnerable individuals. Approximately 10% of people who experiment with cannabis develop dependence. Such a pattern of use

increases the risk of lung diseases. The social and economic costs of a criminal conviction for use may be the most significant harm for many cannabis users. The use of ATS, especially in a binge pattern, is associated with psychotic episodes as well as violent and risk-taking behaviours.

Illicit drug use, like alcohol and tobacco use, is more prevalent among younger people and among males, Indigenous Australians and persons living in the north of Australia. Rates of injecting drug use and notifications for hepatitis C have increased significantly in recent years and are a growing cause for concern. Smoking and episodic risky alcohol use are still the main risk behaviours for preventable drug-related harm. Inhalant use (including petrol sniffing) is also cause for concern, especially among young Indigenous people in some remote locations. Few Indigenous people have escaped the effects of alcohol on family and community life. Higher rates of mental health problems among Indigenous Australians are associated with the same underlying social determinants as substance use but are also exacerbated by the misuse of alcohol.

Culturally and linguistically diverse (CALD) Australians generally have lower rates of drug use.

There are some special concerns with alcohol use among the elderly due to their lower tolerance and the likelihood of interactions with commonly prescribed drugs. However, rates of risky use are also very low in this age group. Light use of alcohol among the middle-aged and elderly is associated with reduced rates of heart disease.

Prisoners and police detainees have higher rates of illicit drug use than are found in the general community. Injecting is common in prisons, as is needle sharing, which brings with it considerable risks for the transmission of blood-borne viruses.

Drug use—both licit and illicit—impacts on the community through its associations with crime and violence, sexual assault, domestic violence, concerns about public safety and amenity; impacts on families, the workforce and road trauma; and also impacts on health through premature death, injury and illness.

4.2 Patterns of drug use, risk and harm in the Australian population

Any discussion of priorities for prevention of drug-related harms must first specify the nature and prevalence of both the harms to be prevented and the significant patterns of related risky drug use. In this chapter, the harms associated with drug use in Australia are examined for a range of different drug types and for different population age groups. Specific attention is paid to settings where harms may be particularly prevalent and to populations vulnerable to harm.

A classification of the many categories of drug-related harm has been presented in Table 1.1 of the first chapter.

It is easier to quantify the health, safety and economic costs of drug use than the social and legal costs. Each year in Australia, alcohol, tobacco and other drugs contribute to almost one in five of all deaths, to more than 185 000 hospital admissions; and cost billions of dollars in health care, law enforcement and lost productivity.^{1, 167, 171} Less easy to quantify, but still important, are the social costs experienced by some drug users, their partners, families and communities. While there has been a substantial rise in the use of heroin and in heroin-

related deaths in recent years,¹⁷² the health costs associated with alcohol and tobacco consumption still greatly exceed those from illicit drugs.

Table 4.1 provides an overview of key indices of health and economic costs, by drug type and broad age groups, using most recent available data.

The key points revealed by this summary table are listed.

- Tobacco is by far the leading cause of premature death and hospitalisation among Australians. Most (77.8%) of tobacco-caused deaths involve persons over 64 years of age. However, tobacco-caused deaths involving children and adults up to 64 years of age are still greater in total than all deaths caused by alcohol and illicit drugs combined for all age groups. The economic costs of tobacco reflect this fact.
- Alcohol causes the deaths and hospitalisation of slightly more children and young people than do all the illicit drugs combined and many more than tobacco. These deaths are almost invariably caused by either intentional or unintentional injuries. While alcohol is also responsible for the deaths of many more adults and elderly people than are the illicit drugs, there are more deaths believed to be saved among older people

as a result of, mainly, low-risk alcohol consumption, principally among older women.

There will also be significant future health costs associated with current drug use that are hard to estimate. The high prevalence of hepatitis C among injecting drug users in Australia means there will be substantial mortality, morbidity and associated economic costs as a result of higher incidence of liver disease in this group, in future years. There is also a range of social harms impacting on individual users of illicit drugs who receive criminal convictions.¹⁷³

The major source of data on population prevalence of drug use in Australia is the NDSHS. This is a periodic self-report questionnaire, distributed to a large stratified population sample surveyed in their homes. There have been seven household surveys, the most recent in 2001, which had a large sample size (26 744) permitting reporting of state level rates of use. There are limitations to the validity of such drug consumption self-report data. In relation

to alcohol, self-reported levels of consumption in the 1998 NDSHS only accounted for 46.5% of the total volume of alcohol actually consumed in Australia as estimated from sales, production, import and export data.¹⁵¹ Users of illicit substances may under-report their use for a number of reasons, including the illegality of illicit drug use, and it is those groups with the highest rates of usage that are the most likely to under-report their levels of use.¹⁷⁴ Additionally, the NDSHS does not include the homeless, those in prison, or highly mobile people who may have higher rates of drug use, and it therefore under-samples the highest risk groups.¹⁷⁵ Finally, the response rate to the 2001 NDSHS was only 51%, a drop of 5% compared with 1998. This is a very low rate and flags a concern about non-response bias—it is known that persons not contacted readily in such surveys tend to be higher users.¹⁷⁶ It is necessary, therefore, to treat survey data as but one indication of patterns of substance use and harm.

Table 4.1 Estimated drug-caused deaths (1998)¹, Person Years of Life Lost (1998), hospital separations (1997/98) and economic costs (1998/99) for tobacco, alcohol and illicit drugs

Drug	Deaths ^{1,2}	Person Years of Life Lost ²	Hospital separations ²	Costs ³ (\$billions)
Tobacco				
0–14 yrs	99	2 998	1 570	
15–34 yrs	80	2 096	7 187	
35–64 yrs	4 042	68 091	59 389	
65+ yrs	14 799	111 393	74 379	
Total	19 019	184 579	142 525	21.06
Alcohol				
0–14 yrs	21	637	1 034	
15–34 yrs	814	21 941	25 207	
35–64 yrs	1 230	25 309	23 594	
65+ yrs	1 046	9 636	6 022	
Total	3 111	57 523	55 857	7.56
Illicit drugs				
0–14 yrs	9	261	44	
15–34 yrs	649	17 296	10 876	
35–64 yrs	332	7 536	3 057	
65+ yrs	33	282	494	
Total	1 023	25 375	14 471	6.08

¹ Estimates are for only lives lost and do not include lives saved

² Source: Ridolfo and Stevenson (2001)¹⁶⁷

³ Source: Collins and Lapsley (2002)¹

Table 4.2 shows NDSHS rates of alcohol and drug use for the population 14 years and over.²² This table shows that a great majority of the population has used alcohol, and about half have used tobacco at least once. Two-fifths have used an illicit drug at least once, predominantly cannabis. Lifetime prevalence rates of other illicit drugs are all less than 10%. It is important to note, however, that any lifetime use of a drug is not inevitably risky drug use and more frequent use is not reported for illicit drugs other than for injecting drugs, rates of which remain at very low levels. Table 4.2 shows that in 2001, a third of Australians aged 15 or over reported drinking regularly at risky levels for short-term harm and that slightly less than 20% of the population smoked on a daily basis.

For most drug types other than alcohol, levels of use in the last 12 months were significantly lower in 2001 than in 1998. This trend may in part be a consequence of the lower response rate to the survey in 2001. Geographically, the 2001 NDSHS illustrates a marked north-south divide in terms of levels of drug use. The NT has the highest rates of smoking, risky alcohol use and 'recent' illicit drug use, followed (by some distance) by WA and Queensland.

The association of mental health and drug use problems is a substantial concern. However, it can be difficult to isolate in every case to what degree drug use causes mental health problems, and to what degree mental health problems give rise to drug use, often in the context of self-medication. There is no doubt, however, that some patterns of alcohol and other drug use can exacerbate pre-existing mental health problems or even precipitate these for the first time. Examples of this include usually temporary psychoses induced by a heavy 'binge' of stimulant drugs, the association of suicide and para-suicide with both cannabis use and alcohol intoxication,¹⁷⁷ the worsening of anxiety and depression during withdrawal from alcohol and opiate drugs, and the increased prevalence and intensity of phobic anxiety states among heavy and dependent drinkers.¹⁷⁸ Collectively, substance use and mental health problems represent the largest contributors to the burden of disease among younger Australians. In those aged 15–24, 90% of the leading causes of disease and injury in men, and 80% of the leading causes in women, are substance use disorders or mental health disorders.¹⁷⁹ Comorbidity is associated with a worse treatment outcome, a longer duration of mental illness, and a high rate of service seeking.¹⁷⁹

Table 4.2 Prevalence of drug use in lifetime and last 12 months for all persons: NDSHS 2001²² (with % change estimates since 1998, where available)

Substance or behaviour	% Lifetime use	% Change (1998–2001)	% Use last 12 months	% Change (1998–2001)
Alcohol (1+ drinks)	90.4	(+0.8)	82.4	(-0.8)
Alcohol: risky in long-term			9.9	
Alcohol: risky in short-term			39.4	
Tobacco	49.4	(-0.6)	23.2	(-1.7)
Any illicit drug	37.7	(-8.3)	16.9	(-5.0)
Cannabis	33.1	(-6.0)	12.9	(-5.1)
Amphetamines*	8.9	(+0.1)	3.4	(-0.3)
Hallucinogens	7.6	(-2.3)	1.1	
Ecstasy/designer drugs	6.1	(+1.3)	2.9	(+0.3)
Painkillers/analgesics*	6.0	(-5.5)	3.1	
Cocaine	4.4	(+0.1)	1.3	
Tranquillisers/sleeping pills*	3.2	(-3.0)	1.1	
Inhalants	2.6	(-1.3)	0.4	
Injected drugs	1.8	(-0.3)	0.6	(-0.1)
Heroin	1.6	(-0.6)	0.2	(-0.5)
Barbiturates	0.9	(-0.7)	0.2	
Steroids	0.3	(-0.5)	0.2	
Methadone**	0.3	(-0.2)	0.1	

* For non-medical purposes

** Non-maintenance

Other forms of harm include harms to self and others incurred when individuals are intoxicated with alcohol and/or other drugs: the NDSHS, for example, reports that between 1998 and 2001 the proportion of the population undertaking a range of activities while under the influence of alcohol and/or other drugs generally decreased.²² In 2001, 12.8% of the sample (18% males and 7.7% of females) reported driving a car while under the influence of alcohol. Other activities performed while under the influence of alcohol included verbal abuse (6.3%), going swimming (5.2%), going to work (4.3%) and creating a public nuisance (2.9%). Activities performed whilst under the influence of other drugs included driving (3.9%), going swimming (2.4%) and going to work (2.3%). In all cases, males were more likely to report these activities than females.²²

Approximately 6% of all Australians (6.6% of men and 4.7% of women) sustained a non-self inflicted injury as a result of an alcohol- or other drug-related incident in the previous year. The most prevalent, most serious injury was bruising or minor abrasions (40.7% of all those injured). Almost 3% suffered injuries sufficiently serious to require hospital admissions. The youngest age groups (14 to 39 years) were the most likely to sustain bruising or abrasions while the oldest group (60+) were the most likely to require hospitalisation (6.1%).²²

4.3 Adult patterns of drug use, risk and harm

The following section discusses particular patterns of risky use of different drugs, and issues regarding the supply and availability of drugs.

4.3.1 Tobacco

Tobacco smoking is the single largest preventable cause of disease and death in Australia.¹⁶⁷ It has been estimated to cause 15% of all deaths, typically through chronic health conditions resulting from long-term smoking across the life course.

The prevalence of regular tobacco use in Australia is broadly similar to that found in the USA, UK, Canada and New Zealand, in which countries about one-fifth to one-quarter of adults smoke tobacco.¹⁸⁰ Smoking is more common among people with low education, with low occupational status and who live in rural Australia.¹⁸¹ Cigarettes are the dominant form of tobacco used and, in 2001, NDSHS smokers reported smoking approximately 16 per day on average.²²

Trends: there has been a dramatic reduction in smoking over the past 50 years. The 2001 NDSHS and reports of Customs between 1995 and 2002 confirm that this trend continues, notwithstanding evidence of an increasing black market in cigarettes.¹⁸²

Harms: the acute harms of smoking are largely restricted to novice users who generally experience nausea, dizziness, and other symptoms. Tolerance to these effects develops quickly.¹⁸³ However, some acute harms, such as the reduced ability of the blood to carry oxygen, which results in diminished exercise performance, are maintained.¹⁸³

The chronic harms include 32 diseases and conditions related to active smoking.¹⁸³ The main causes of tobacco-related deaths in 1998 were cancer (40%), chronic obstructive pulmonary disease (20%) and ischaemic heart disease (21%).¹⁸⁴ Cessation of smoking, however, causes a rapid decline in the risk of both mortality and morbidity,¹⁸³ which demonstrates the importance of policies and interventions aimed at encouraging smoking cessation. For those stopping at the ages of 60, 50, 40, and 30, the cumulative risk of lung cancer by age 75 is 10%, 6%, 3%, and 2%, respectively.¹⁸⁵ Collectively, these findings have significant implications for smoking policy. Over a relatively short period, the excess mortality could be substantially reduced by current younger smokers giving up the habit.¹⁸⁵

In relation to impact on non-smokers, passive smoking has been estimated to account for 12 new cases of lung cancer each year and 77 deaths from coronary heart disease.¹¹⁴ Australian Institute of Health and Welfare estimates were that 128 deaths were attributable to environmental smoking in 1998.¹⁸⁴

4.3.2 Alcohol

The physical availability of alcohol has increased markedly in Australia over the past two decades, as it has in most economically developed countries.¹⁸⁶ Licensing laws have been continuously revised to simplify and streamline procedures for acquiring liquor licences, trading hours in all jurisdictions have been extended, and laws regarding service to intoxicated and underage drinkers are enforced intermittently at best.¹⁸⁷ There have been several significant developments in the alcohol market over the past 30 years.¹⁸⁸ One has been the rise in the popularity of Australian wine, both domestically and internationally. This has been encouraged by a favourable taxation regime for wine in comparison with beer and spirits. This situation encourages both

the widespread distribution and consumption of cheap packaged wine (cask wine is an Australian invention) and the production of wine-based fruit drinks ('alcopops'). Another important development has been the rise in popularity of low- and mid-strength beers, apparently encouraged both by tax breaks for lower strength beers and aggressive enforcement of drink-driving laws across Australia in the 1990s. Beer with a strength of less than 3.8% was estimated by the Australian Associated Brewers to comprise 40% of the total Australian beer market in 1999.¹⁸⁹ Since 1 July 2000, a new alcohol tax system has been in operation that, on the one hand, reduced taxes on premixed spirits to a rate slightly higher than full strength beer and, on the other, increased taxes on alcoholic sodas and lemonades with a wine base to the same level as pre-mixed spirits. The result appears to have been a dramatic switch in market share from full strength beer to pre-mixed spirits, though the net level of alcohol consumption has remained static.¹⁹⁰

Estimates from the 1998 NDSHS of how much alcohol was drunk in Australia at risky levels for health by persons aged 15 and over, found that 39% of all alcohol was consumed at levels that posed health risks in the long-term; 51% was consumed at levels posing short-term health risks. Two-thirds of the alcohol consumed in Australia in 1998 posed a risk of chronic and/or acute health consequences. For young adults, this figure was 90% of all the alcohols consumed by that age group—primarily by drinking in ways that place the drinker at risk of acute harm. These estimates are conservative since average consumption reported in that survey was less than half that estimated from official statistics of 1998 alcohol sales.¹⁹¹ These data should be considered in the context of the clear national and international trend for increased risky alcohol use by adolescents and young adults.

Trends: in the late 1980s and early 1990s, per capita alcohol consumption fell in Australia, as in most economically developed countries, then levelled off until the late 1990s when it has increased slightly.¹⁹²

Harms: alcohol is responsible for the majority of drug-related deaths and substance-related hospital episodes in young people.¹⁹³ Acute harm (as a result of road trauma, violence, accidents, acute intoxication) is disproportionately experienced in the younger end of the population. Chronic harm, on the other hand, is largely experienced in an older population.¹⁹⁴ While there are slightly more deaths

caused by the long-term toxic effects of alcohol than from heavy episodic drinking, two-thirds of alcohol-caused person years of life lost are due to either the acute effects or conditions caused by a combination of acute and chronic effects of alcohol.¹⁹⁵ Combining estimates of deaths from ethanol toxicity, alcoholic beverage poisoning, other ethanol/methanol poisoning and aspiration yields a total of 96 deaths for Australia in 1997 that could be broadly described as alcoholic overdose.¹⁹⁵ It should be noted that a significant number of opiate overdose deaths involve concurrent heavy alcohol use and so this figure is likely to be an underestimate.¹⁶⁶

Data from the National Survey of Mental Health and Well-being (NSMHWB) indicate that 8.2% of the population aged 18–50 have an alcohol use disorder as defined by DSM-IV criteria.¹⁹⁶ The estimates of economic costs of alcohol misuse in Table 4.1 do not include those associated with mental health problems and there is mounting evidence that alcohol is implicated in the highly prevalent depressive and anxiety-related disorders. Longitudinal research on the relationship between alcohol dependence and major depression shows that alcohol dependence increases the risk of having major depression one year later, and equally, the presence of major depression elevates the risk of having an alcohol dependence disorder one year later.¹⁹⁷ A variety of studies report that the lifetime prevalence of major depressive disorder in people seeking treatment for alcohol dependence is around 40%. The co-occurrence of major depression and alcohol use disorders elevates the risks of both violence and suicidal behaviour.¹⁹⁷ Alcohol dependence is a major risk factor for suicide.¹⁹⁸

Low risk alcohol consumption is believed to have a positive effect on health by way of reducing the risk of ischaemic heart disease among older people.¹⁸⁴ Because heart disease is the most common cause of death, any assumption of such benefits frequently results in a net positive effect of alcohol on mortality.¹⁹⁹ There is a growing consensus against publishing such net figures for the outcomes of all types of drinking patterns combined. It is important to separately identify the deaths associated with risky/high-risk drinking on the one hand (3 294), and the lives saved in association with low-risk drinking on the other (6 605).¹⁹⁹ A net figure completely misrepresents this situation but has been the basis of most epidemiological and economic cost estimates of alcohol-related harm in Australia.

4.3.3 Pharmaceuticals

The non-medical use of pharmaceuticals has been identified as one of the major drug problems in Australia.²⁰⁰ The Australian Illicit Drug Report (AIDR) states that prescribed drugs, including opiates such as morphine and methadone; benzodiazepines, particularly diazepam and temazepam; and amphetamines prescribed for Attention Deficit Disorder, such as dexamphetamine and methylphenidate (Ritalin), are obtained illegally by feigning symptoms, 'doctor shopping', using stolen and forged prescriptions and theft from pharmaceutical and surgical establishments.¹⁶⁸ Another level of pharmaceutical use relates to misuse or overuse of over-the-counter (OTC) drugs. This includes the purchase of preparations containing pseudoephedrine for the illicit manufacture of amphetamines, which is discussed further in chapter 12.

The 2001 Illicit Drug Reporting System found that the non-medical use of methadone, morphine, benzodiazepines and anti-depressants was common in a national sample of 951 injecting drug users. Diazepam was most commonly used, by up to 86% of respondents in the previous sixmonths.²⁰¹ High rates of benzodiazepine use are also found among police detainees. In 2001, the Drug Use Monitoring in Australia study (DUMA) found that 21% of men and 33% of women in police lockups tested positive to benzodiazepines.²⁰²

Trends: the 2001 NDSHS survey indicates a reduction in the use of benzodiazepines without prescription since 1998.

Harms: benzodiazepines (e.g. Serepax [oxazepam], Valium [diazepam], Euhypnos [temazepam] and Rohypnol[flunitrazepam]) are frequently prescribed in the treatment of a range of anxiety conditions and for insomnia and are often associated with dependence and related problems. Benzodiazepine dependence produces a pronounced and distressing withdrawal syndrome.²⁰³ It has been estimated that 44% of long-term benzodiazepine users become dependent.²⁰⁴

Flunitrazepam has recently been placed on Schedule 8 of the National Drugs and Poisons Schedule because it has a higher abuse potential than other benzodiazepines, particularly in relation to the risk of death in heroin users.²⁰⁵ Other harms found to be associated with flunitrazepam include violent behaviour, prolonged sedation and short-term memory loss.²⁰⁵ This drug is also associated with drug-assisted sexual assault.

Heroin users frequently use benzodiazepines, either as a supplement to opiates or as an alternative in times of scarcity. The combination of heroin and benzodiazepine use, particularly when alcohol is also being consumed, is a key factor in heroin overdose.

4.3.4 Performance and image enhancing drugs

While there are many types of performance enhancing drugs, the anabolic/androgenic steroids are most commonly used. Steroids are taken for two primary reasons: improving physical appearance through increased muscle mass and decreased body fat, and for improved athletic performance in some sports. They exert both effects by increasing muscle mass and strength.²⁰⁶ Steroids have no effect on the aerobic capacity of athletes and are considered of little use in endurance-based sports.²⁰⁷ The 2001 NDSHS reported use in the last 12 months by only 0.2% of the population and lifetime use by 0.3%,²² but steroids are readily available in some gyms²⁰⁰ and via mail order from overseas internet sites.¹⁶⁵ Use is largely confined to those involved in bodybuilding, some athletes and those in the security industry.*¹⁶⁵ The gay population also reports a comparatively high rate of steroid use, at around 4% using in the past sixmonths.²⁰⁸

Trends: non-steroid performance enhancing drugs have become more common recently among elite athletes, for example, human growth and thyroid hormones, human chorionic gonadotrophin and levodopa.²⁰⁹

Harms: there is little recorded evidence that steroids are a significant public health concern in Australia. No deaths and only two hospital episodes in 1998 are attributed to anabolic steroids.¹⁸⁴ However, the long-term effects of the drugs are not well known and their short-term effects on personal appearance can for some be highly undesirable. Overall reported levels of side effects and harms are considered low, especially given the high doses of steroids typically consumed.²⁰⁷ In males, harms include gynecomastia (development of breast tissue), testicular atrophy and temporary infertility.²⁰⁷ In females, harms include decreased breast size, menstrual irregularities and growth of facial hair²⁰⁷, and clitoral hypertrophy. There are case reports of premature halting of growth in younger female steroid users, although these effects have not been systematically studied.²⁰⁹ Harms for both genders include skin rashes, acne, deepening of the voice, increased water retention, jaundice and changes in libido. Chronic harms have been known

* A discussion of the role of steroids in elite sport is beyond the scope of this document

to include liver disease, cardiovascular disease and sterility.²⁰⁷ However, in the majority of users, health problems are minimal and they are not likely to be long-term, although the patterns of harm in long-term chronic users on heavy dose regimes remains unknown.^{207, 209} Nearly all steroid users inject²¹⁰ but rarely share needles^{207, 211} so there is little blood-borne virus (BBV) risk.²⁰⁷ There is little evidence to demonstrate increased risk of mental health disorders.^{207, 210, 212}

4.3.5 Cannabis

Around 33% of Australians have consumed cannabis at some point in their lifetime and approximately 13% of Australians have consumed cannabis in the past year.²² Cannabis is readily available in all parts of Australia,^{165, 213} being increasingly produced hydroponically.¹⁶⁵

Gender and age are strong correlates of levels of usage. Men are more likely to have tried cannabis and more likely to be frequent users. In the NSMHWB: while 10.3% of men used cannabis more than five times in the past 12 months, only 4.3% of women had used at this rate.²¹⁴ Increased levels of education are associated with likelihood of having ever used cannabis, whereas lower levels of education are associated with more frequent use.¹⁶⁶ Australian data indicates that only around 10% of people who ever use cannabis become daily users, with another 20 to 30% becoming weekly users.¹⁶⁶

Trends: lifetime usage rates have risen substantially over the past twenty years but have dropped in recent years. The estimated prevalence of lifetime cannabis use for those over the age of 14 was 12% in 1973, compared to almost 40% in 1998.²¹⁵ A reduction in rates of cannabis use is evident for secondary school children between 1996 and 1999 as shown in the previous chapter.

Harms: while cannabis is not a harmless drug, the health risks associated with cannabis appear to be smaller than for most other drugs, legal or illegal. Despite its wide use, there were only 652 hospital separations and no deaths attributed to cannabis in 1998.¹⁶⁷

The acute harms are: anxiety, dysphoria, panic, and paranoia although these rarely lead to help-seeking.¹⁶⁶ Chronic harms include the damage done to lungs through smoking, though the full extent of this remains to be determined.^{216, 217} A confounding factor is that most cannabis smokers also smoke tobacco.¹⁶⁶ There is considerable anecdotal evidence from both cannabis users and clinicians that prolonged use can have a negative impact on

attention, memory, and concentration. Carefully controlled studies indicate significant though modest impairments of cognitive functioning.²¹⁸

Most authoritative reviews conclude that cannabis does not cause psychosis in its own right¹⁶⁶ but use can exacerbate symptoms of schizophrenia and psychosis in those already suffering these conditions, and may precipitate the onset of schizophrenic episodes in those already vulnerable to such an episode due to personal or family histories of schizophrenia.²¹⁹ New evidence that adolescents using cannabis may be especially vulnerable to such effects (see Chapter 3) warrants careful scrutiny.

4.3.6 Amphetamine type stimulants (ATS)

ATS are the second most commonly used illicit drugs after cannabis,¹⁸⁴ with most of this use being methamphetamine.¹⁶⁸ ATS are produced and readily available in Australia.^{165, 213} The ATS classification used in this report includes amphetamine, dexamphetamine, and meth(yl)amphetamine. It excludes phenethylamines, such as MDMA, which are described in a later section. The most current illicit ATS used in Australia is methamphetamine, which has a longer duration of action than amphetamine.²²⁰ In the 2001 DUMA data collection, 385 of 412 positive amphetamine screens were confirmed with meth(yl)amphetamine only or in combination with amphetamines.²⁰² Regular ATS users are more likely to inject than occasional users.¹⁶⁶

Trends: amphetamine use has been widespread in Australia since the mid-1980s. In the NDSHS, use in the last 12 months increased among men from 2.8% in 1995 to 5% in 1998, but fell slightly to 4.2% in 2001. Increases in amphetamine use from 2000 onward have been notable in the DUMA survey.^{202, 221} The AIDR noted that the heroin 'drought' had led to a nation-wide increase in the use of other drugs including ATS.¹⁶⁸ The annual multi-centre Illicit Drug Reporting System (IDRS), in 2001, noted that the prevalence and frequency of methamphetamine use increased between 2000 and 2001 with increased use of 'base' and 'ice', which are potent forms of the drug.¹⁶⁸

Harms: ATS users generally suffer a high level of morbidity and a low level of mortality. Harms from ATS use are mostly related to mental rather than to physical health. In 1997/98 there were three to six deaths and 409 hospital admissions related to amphetamines dependence or abuse.¹⁶⁷ Physical health problems include poor appetite, fatigue, tremors, sleep disturbances, cardiac arrhythmias,

headaches, joint pains and weight loss.²¹³ Overdose on ATS can occur, associated with circulatory collapse, cerebral haemorrhage and myocardial infarction.²²⁰

Mental health effects include acute effects such as anxiety or aggression, with typical after-effects of fatigue and depressed mood.²²⁰ Regular use can induce personality changes, with users typically becoming irritable, suspicious, dysphoric, anxious, and at times aggressive.²²⁰

Heavy users typically use less regularly than opiate users and 'binge' over a period of a few days and nights, often followed by the use of benzodiazepines or other sedatives to come down.¹⁶⁶ Such bingeing can induce a temporary psychosis identical in symptoms to an episode of paranoid schizophrenia and this psychosis can be reliably induced in people with no history of, or predisposition towards, mental illness.¹⁶⁶ ATS use can also severely exacerbate psychotic symptoms in those already experiencing a psychotic mental illness of some form.²²⁰

The existence of an amphetamine dependence syndrome, comparable to that of alcohol and tobacco, has recently been documented.²¹³

4.3.7 LSD, GHB and ketamine (hallucinogens)

The availability and use of LSD are stable and low in most jurisdictions. It is usually used infrequently and alongside other recreational drugs. Typically, hallucinogen users are young, unemployed males born in Australia or the UK.¹⁶⁶

GHB (gamma hydroxybutyrate) is a relatively scarce drug that is not investigated separately in the NDSHS. There has been a significant increase in the number of Customs seizures of GHB at the border, from three seizures in 2000/01 to 18 in 2001/02,¹⁶⁵ suggesting a trend of increased popularity of the drug.

Ketamine use is relatively rare and is not investigated in the NDSHS. One study of ketamine users found that users tended to be older, male, poly-drug users; many of whom were gay. The group was well educated and relatively well-off financially. Use was predominantly in nightclubs and dance parties.¹⁶⁸

Trends: in the NDSHS, lifetime prevalence of hallucinogens increased from 7% in 1995 to almost 10% in 1998, and then decreased to 8% in 2001.

Harms: one Australian death was attributable to hallucinogens in 1998, along with 234 hospital episodes.¹⁶⁷ Deaths are very rare and are typically a result of bizarre behaviour rather than overdose.¹⁶⁶

The harms associated with hallucinogen use appear to be mainly of an acute psychological nature, such as depression or a psychotic episode.¹⁶⁶ There is little evidence of dependent use or even a pattern of frequent use.¹⁶⁶ The oft-mentioned 'flashback' syndrome, where users experience elements of the hallucinogen experience at a later date, sometimes years afterwards, is typically associated with fairly heavy LSD use.¹⁶⁶

A small study of Australian GHB users found other drugs were used 95% of the time, which probably increased negative effects.²²² Users reported dizziness, blurred vision, hot and cold flushes and vomiting. Half of the sample reported losing consciousness after GHB, and almost half had experienced blackouts or memory lapses. One in twelve users reported having a fit or seizure after using GHB.²²² The Australian Bureau of Criminal Intelligence (ABCI) reports that while there have been media reports of GHB deaths, the real rate of such deaths is unknown.¹⁶⁵

4.3.8 Phenethylamines (MDMA, ecstasy)

MDMA (Methylenedioxyamphetamine) and related drugs are defined in different surveys as MDMA, ecstasy, 'designer' or 'party' drugs. The broader term phenethylamines is used by the Australian Standard Classification of Drugs of Concern¹⁶⁸ and is used in this report except where specific research is reported, when the terminology is that used by the authors.

Drugs described as 'ecstasy' are easy to obtain in Australia²²³ but most do not contain any MDMA and are more likely to be methamphetamine combined with a synthetic hallucinogen.¹⁶⁵ Those containing ecstasy or a related substance (e.g. MDA or MDEA) had an average purity of 33%, with a range of 3% to 93%.²²³

Phenethylamines users have recently been profiled as being 'young, relatively well educated, likely to be employed or engaged in studies, and to have little contact with social authorities such as the police or treatment agencies' (p1).²²³ Phenethylamines users are less likely to be unemployed than users of other illicit drugs.¹⁶⁶

Trends: the use of phenethylamines has been steadily increasing in popularity since the late 1980s, with users becoming younger and using more frequently and heavily.¹⁶⁶

Harms: acute symptoms of use include increased heart rate and body temperature, increased reflexes, muscular cramps, tremor, dry mouth, loss of appetite, vomiting and sleeplessness.²²⁰ Many studies have documented reduced mood and feelings of anxiety in the few days following MDMA use.²²⁴ Other common side effects over the next few days include insomnia, drowsiness, depression and difficulty concentrating.²²⁵

Between 1995 and 1997, there were at least 12 deaths in Australia associated with ecstasy use, of which six involved PMA (paramethoxyamphetamine, an amphetamine analogue with a high degree of toxicity).²²⁶ Deaths have variously involved persons with pre-existing cardiac conditions,²²⁰ hyperthermia, and ingestion of excessive amounts of water.¹⁶⁶ Such deaths have typically occurred at dance venues. Hyperthermic syndrome can be successfully treated in the majority of cases, if medical intervention is available.²²⁰

Concern exists that MDMA may cause later cognitive deficits though there is no definitive evidence.²²⁷ Investigating psychiatric problems associated with ecstasy has proven difficult due to high rates of poly-drug use among those presenting with psychiatric symptoms.²²⁰ There are reports that that ecstasy use has been associated with paranoid psychosis, flash-backs, suicidal ideation, depersonalisation, anxiety states, panic attacks, and depression. However, reviews of these particular case histories also indicates previous psychiatric histories and high rates of psychiatric morbidity among first degree relatives.²²⁰ Heavy use may be associated with heightened anxiety and aggressiveness.²²⁵

4.3.9 Cocaine

Cocaine appears to be far less common in Australia than it is in many other western nations, being restricted mainly to injecting drug users in Sydney. The use of crack cocaine is extremely rare in Australia.¹⁶⁵

Cocaine use may be associated with a broader socioeconomic range of users than most illicit drugs.²⁰⁰ There is some traditional association between its use and young, well-paid professionals,²⁰⁰ but there are no representative Australian data to support this supposition. NDSHS data indicates a higher rate of cocaine use among unemployed people.¹⁶⁶

Trends: injection use of cocaine has risen over time in Sydney, from the first IDRS survey in 1996 where no users nominated cocaine as their drug of choice,

to 39% in 2001. Cocaine may be supplanting ATS as the stimulant of choice among many stimulant users.¹⁶⁶ Cocaine availability and purity in NSW has been increasing steadily since 1996.²²⁸ Slight increases in cocaine availability were noted in 2001 in Victoria, ACT, SA, Queensland and WA.²⁰¹ As with ATS, the strong increase in cocaine use by Sydney's injectors has been associated with the corresponding decrease in availability of heroin over this time as a result of the well-publicised 'heroin drought'.²²⁸

There were no sizeable detections of cocaine among police detainees in the 1999 and 2000 DUMA data. Cocaine began to be detected in Sydney in early 2001 and increases were sustained throughout the year. No such trends were observed in the non-Sydney sites. These trends reflect the localised and rapidly changing nature of illicit drug markets, which has relevance for prevention initiatives.²⁰²

Harms: there are no Australian data on the prevalence of harms associated with cocaine use. Harms associated with injection are discussed generically below.

4.3.10 Heroin

Estimates based on the 2001 NDSHS were that 37 700 people had used heroin in the previous year, while 252 600 had ever used heroin.²² However, estimates of the number of dependent heroin users from diverse indicators such as overdose prevalence, arrests, methadone prescriptions, ambulance call outs and needle exchange usage suggest there were 100 000 in 1998.²²⁹ These discrepant results reflect the inability of surveys to accurately estimate prevalence of illicit drug use.

Heroin users are typically older than other illicit drug users, male and unemployed.¹⁶⁶ They are also typically from a disadvantaged background, have a history of problems at school and at home, and are often impulsive.²²⁹ Heroin is usually injected in Australia. Non-injecting use of heroin is more common in Australia's Indochinese population than in other sociocultural groups.¹⁶⁶

Trends: heroin use increased substantially through the 1990s; during this period there was evidence that new cohorts of users were both younger on initiation to heroin and more likely to be female than older cohorts.¹⁶⁶ Use has fallen since December 2000, however, when the current 'drought' commenced.¹⁶⁸ The latest AIDR reports that although heroin remained scarce in the second half of 2001, there is evidence that heroin was

becoming more available in major Australian capital cities in the first half of 2002, though not to pre-drought levels.¹⁶⁵

Harms: the main physical and mental health problems associated with heroin use are fatal and non-fatal overdose, dependence and the high risk of contracting BBVs, because almost all heroin is injected.²²⁹ It has been estimated that between 0.5 and 1% of the heroin-using population dies each year from a drug overdose and that dependent heroin users have approximately a one-third chance of dying from their heroin use.²²⁹

The total number of non-fatal overdoses per annum has been estimated at 12 000 to 21 000,²³⁰ with some studies indicating that the lifetime prevalence of non-fatal overdose in heroin users is 67%.¹⁶⁶ Heroin deaths increased from 10 per year in the late 1960s to more than 500 per year from 1995 onward but have declined since. The number of opioid-related deaths among 15 to 44 year olds in Australia decreased from 958 in 1999 to 725 in 2000.²³¹

Death from heroin overdose usually results from respiratory failure, which is a consequence of its central nervous system depressant effects.²³⁰ Risk factors include concomitant use of benzodiazepines, alcohol, and other central nervous system depressants,¹⁶⁶ loss of tolerance from periods of reduced use, such as time in prison or in treatment; and fluctuations in heroin purity. There is no evidence of toxicity resulting from contaminants of heroin in Australia.²³⁰

Studies, worldwide, have shown repeatedly that heroin users have high rates of psychological problems with the most common being depression, anxiety and antisocial personality disorder.¹⁶⁶ A study of Australian methadone patients found very high rates of psychiatric disorder but in over 70% of cases with psychiatric dysfunction, the onset of psychiatric symptoms was reported to predate the use of heroin.²³²

4.3.11 Inhalants

The broad category of inhalants includes drugs of differing harm potentials. Volatile solvents include a wide range of different products, including types of paints, glues and petrol. These drugs have serious harm potential in both the short- and long- term.²³³ Other inhalants (that are not volatile solvents) include nitrous oxide (once known as laughing gas), various types of asthma medication, household gases such as butane and bottled domestic gas, and nitrites. Levels of use appear to be significant only

in some populations of adolescents and are then rapidly replaced by other substances, legal and illegal, in later teenage years.

Lifetime rates of inhalant use in the adult population decreased in the NDSHS from 3.9% in 1998 to 2.6% in 2001 with a concomitant decrease in recent use.

4.3.12 Poly-drug use

Poly-drug use is a common pattern, not just among users of illicit drugs, but also among users of legal drugs and pharmaceuticals. In this respect, cannabis use more closely resembles licit than illicit drug use. NDSHS 1998 data show that there is a strong association between tobacco and alcohol use: 90% of recent smokers had recently consumed alcohol and one in three recent drinkers reported recent tobacco use.¹⁸⁴ There is also an association between tobacco, alcohol and cannabis use. In 1998, one in five recent drinkers reported recent cannabis use, which is a higher rate of consumption than the general population, and 40% of recent smokers had recently used cannabis. Almost all recent cannabis users had recently used alcohol, and 57% of cannabis users had recently smoked.¹⁸⁴ Among people who had recently used pain-killers/analgesics for non medical purposes, 87% had recently used alcohol, 41% cannabis and 39% tobacco.¹⁸⁴

Users of illicit drugs other than cannabis commonly use tobacco, alcohol and cannabis, as well as combinations of ATS, hallucinogens, phenethylamines, cocaine, heroin and benzodiazepines.¹⁶⁶ This is particularly true of injecting drug users.²²³

Harms: poly-drug use has been shown to be a significant factor in heroin-related deaths. Alcohol was detected at autopsy in 46% of fatal overdoses in the New South Wales study, and benzodiazepines in 27%.²³⁴ In a Victorian study,²³⁵ alcohol was detected in 37% of cases and benzodiazepines were present in 44% of cases.

Mixing cannabis and alcohol is believed to greatly increase the acute risks associated with intoxication. In Victorian research examining autopsies for fatally injured drivers, alcohol was present for 27% and cannabis was the next most frequently detected substance at 15%.²³⁶ The risk of asphyxiation is increased through the mixture of alcohol and benzodiazepines. Darke et al. observed that, despite clear differences in the psychoactive properties of amphetamine and heroin, there was a tendency for injecting drug users to move intermittently between using them.²³⁷

In DUMA in 1999, one in three police detainees tested positive to multiple drug use (use of two or more drugs from amphetamines, benzodiazepines, cannabis, cocaine and opiates) and 13% tested positive to multiple drug use not including cannabis. Predictors of multiple drug use were: being on government benefits, raising money from illegal activities, and having been arrested in the previous 12 months.²³⁸

4.3.13 Injecting drug use

Injection of drugs is a major risk factor for serious adverse health effects. The 1998 NDSHS estimates indicated a national population of around 300 000 people who have ever injected illicit drugs and 110 000 people who had done so in the previous 12 months.¹⁷⁵ Again, these self-report figures are likely to underestimate true prevalence. There are two national monitoring systems that detail injecting behaviour. The Australian Needle and Syringe Program (NSP) Survey is an annual study that has been surveying NSP participants in every jurisdiction since 1995. Its focus is the prevalence of hepatitis C and HIV/AIDS, using tested blood samples and patterns of injecting behaviour.²³⁹ The Illicit Drug Reporting System consists of three components: interviews with injectors, interviews with key informants who have regular contact with injectors, and examination of extant data sources related to illicit drug use.²⁰¹ These two surveys identify high rates of unemployment, incarceration and low education levels. Most injectors are male and the average age of first injection was 18.

In the 2001 IDRS it was noted that in response to the shortage of heroin throughout 2001, some injectors had switched to injecting stimulants—ATS in most jurisdictions, and cocaine in NSW.²⁰¹ NSW was the only jurisdiction where a substantial proportion had last injected cocaine. An increase in the reporting of cocaine use by injectors in Sydney was first noted in 1998.²⁴⁰ It was initially thought that this rise was largely associated with the practice of speedballing, or mixing cocaine and heroin,²⁴⁰ but more recent data has demonstrated that cocaine-only injecting is also becoming more common.²⁰¹

Extensive poly-drug use is the norm amongst injectors. The 1998 NDSHS data were used to show that 26% of those injecting in the past 12 months injected both ATS and heroin, and 18% reported injecting other combinations.¹⁷⁵ Between a third and a half of injectors in all jurisdictions reported the use of illicitly obtained benzodiazepines in the preceding six months. Many of those who obtained benzodiazepines illicitly also obtained them on prescription.²⁰¹

It is very rare for people to switch back to other means of administration after they have begun injecting and this usually occurs only in the context of vascular damage.¹⁶⁶ In a study of more than 300 ATS users in Sydney, Ross *et al.* noted that while 78% of users first used the drug by non-injecting means, only one-third continued to use this method with the remainder making a transition to injecting.²⁴¹ In a Perth study, opiate users considered smoking of heroin a waste of money because there was a perception that more of the product was required.²⁴²

Trends: the NDSHS shows widespread injecting of ATS as well as heroin and it has been demonstrated that between 1980 and 1995 the predominant drug of first choice was amphetamine; after 1995, heroin became cheaper and more widely available.¹⁷⁵ In the 2001 IDRS, ATS were most frequently (38%) nominated as the last drug injected, followed by heroin (35%), morphine (12%), cocaine (7%) and methadone (5%).

The rate of injecting drug use has greatly increased since the 1988 NDSHS survey.¹⁷⁵ Other multiple indicators point to an increase in the use of illicit drugs, particularly those that are traditionally injected. Encouragingly, however, data from Australian needle and syringe programs show that needle sharing has declined from 31% in 1995 to 16% in 2000.²⁴³ However, 49% of injectors report sharing equipment such as spoons, filters, and tourniquets, which can also result in viral transmission.¹⁸⁴

Harms: injecting is associated with a very high risk of BBV infections, increased risk of overdose among heroin users, and dependence. Injecting can cause harms to the community as well as to individual drug users if use results in improperly discarded syringes.²⁴⁴

Health complications associated with injecting illicit drugs can result from contaminants in the drugs, use of non-sterile injecting equipment, blood-to-blood contact with contaminated blood from another drug user, and failure to inject in a sterile site or an appropriate body location.²⁴⁵ Non-communicable and communicable infections are associated with injecting—the major non-communicable infections are: thrombophlebitis (inflammation of the vein); bacteraemia (blood poisoning) and septicaemia; and endocarditis (inflammation of the endocardium, which lines the heart).²⁴⁵ Injection of temazepam from capsules causes significant harms to the circulatory system, including abscesses, blocked veins, and tissue damage due to lack of circulation.²⁴⁶ Temazepam gel

caps have recently been moved to Schedule 8 of the National Drugs and Poisons Schedule in order to reduce their use by injectors.²⁴⁷

The prevalence patterns of BBVs among injectors vary greatly. HIV prevalence among those presenting at needle and syringe exchanges is low by world standards, at less than 2%.²⁴³ In 1999, only nine of the 196 new AIDS diagnoses were solely attributable to injecting drug use. The percentage of AIDS diagnoses attributable solely to injecting has remained relatively constant at around 9 to 12% since 1992; 9% of AIDS deaths in 1999 were believed to be in cases where AIDS was obtained through injecting drug use.¹⁸⁴

Hepatitis B was first identified as a virus in 1965, long before HIV/AIDS and hepatitis C. In Australia, there are 150 000 to 180 000 hepatitis B infected individuals with an estimated 1200 deaths per annum.²⁴⁸ Hepatitis B is efficiently transmitted by blood, vertical transmission and by sexual contact, and people who inject drugs are at high risk of infection. The prevalence of hepatitis B among injectors, in a 1994 national study, was 18.9% positive (anti-hepatitis B core EIA positive) and was positively associated with duration of injecting.²⁴⁹

Of the three BBVs, hepatitis C is by far the most prevalent amongst those who inject drugs. To the end of 2000, over 160 000 Australians had been exposed to hepatitis C of which 80% are estimated to be related to injecting drug use. Mathematical modelling has indicated 16 000 new infections in 2001.²⁵⁰ Just over 50% of people presenting at needle and syringe programs in 2000 had hepatitis C.²⁴³ Clients of Australian needle and syringe programs who had injected for six years had a prevalence rate of 65%; for three to five years, 30%; and less than three years, 20%. This demonstrates that the length of time spent injecting is a critical risk factor.

Hepatitis C is a major public health concern due to the possible sequelae of serious health consequences such as cirrhosis of the liver and hepatocellular carcinoma, which can result from chronic infection. It is estimated that of one hundred individuals diagnosed as hepatitis C antibody positive, approximately 50% will progress to chronic infection over a 15 year period. For those who progress to chronic infection, 50% will develop cirrhosis over a 25 year period and of these, 25% will develop liver failure and 10% liver cancer; both conditions usually fatal within two years.²⁵¹ Infection carries with it a high probability of long-term carriage and infectiousness and treatment options are restricted. The potential health care costs

are large and will probably exceed those of HIV/AIDS in the coming decades.

The social costs of hepatitis C infection among IDUs are difficult to quantify. Chronic hepatitis C infection frequently results in overwhelming fatigue, malaise, abdominal pain and headaches that can result in significant life disruption.²⁵²

Discrimination against those with hepatitis C occurs within the general community, amongst the medical profession, and sometimes within families themselves.²⁵³

4.4 Patterns of drug use, risk and harm among older Australians

Table 4.3 summarises data from the 2001 National Drug Strategy Household Survey regarding the prevalence of drug use in those older than 60.²² Rates of use of both licit and illicit drugs are substantially lower for the elderly. However, the cumulative effects of lifetime tobacco and alcohol use, and acute problems associated with loss of tolerance and interactions of alcohol with prescribed drugs, reduce some benefits accrued due to reduced prevalence.

Harms: patterns of harm reflect these drug use patterns. Smoking is by far the leading cause of drug-related deaths in the elderly, with almost 15 000 deaths per annum (see Table 4.1)²⁵⁴ compared with just over 1000 alcohol-related deaths. There were a total of only 33 deaths estimated to be related to the use of illicit drugs in 1998, mostly from the consequences of hepatitis C acquired earlier in life. A pattern of light drinking protects against heart disease and is thought to prevent over 5000 premature deaths per year in the elderly. The optimal level of intake has been estimated to be between one and two drinks per day for men and one or fewer drinks per day for women.²⁵⁵

The elderly are more vulnerable to harms from alcohol due to lower tolerance, increased sensitivity and increased likelihood of interaction with other medications;²⁵⁶ even relatively small amounts of alcohol can cause problems. It is possible, in an elderly population, for consumption to remain steady while one's ability to tolerate that level of consumption decreases, leading to alcohol-related problems without any increase in consumption.²⁵⁶ This results in a significant number of alcohol-related fall injuries.²⁵⁶ Elderly persons admitted to general hospital wards drink more than their counterparts in the community. One study found as many as 21% of inpatients aged 65 to 74, 10% of

Table 4.3 Prevalence of different drug-using patterns in Australians over the age of 60: NDSHS 2001²²

Substance/behaviour	Males over 60 %	Females over 60 %
Tobacco		
Regular smoker	10.2	7.8
Occasional smoker (weekly or less)	1.3	0.5
Ex-smoker	53.0	26.6
Never smoked	35.5	65.2
Alcohol		
Current drinker	79.9	67.0
Risky/high-risk drinker for long-term harm	8.0	4.4
Risky/high-risk drinker for short-term harm (at least monthly)	7.6	2.6
Illicit drugs		
Lifetime cannabis use	3.5	1.6
Cannabis use in past 12m	0.7	0.3
Lifetime illicit use (including cannabis and misused pharmaceuticals)	9.2	7.7

those aged 75 to 84, and 5% of those above 84, drank at hazardous or harmful levels.²⁵⁷ For emergency ward patients over 65, 19% of males and 6% of females drank at these levels.²⁵⁷

Elderly people experience a high rate of social and emotional problems associated with bereavement and social isolation. Some elderly people, especially women, develop harmful drinking patterns in response to these adverse circumstances later in life.^{256, 258, 259} Such late onset drinkers respond better to treatment and experience less harms than do elderly people with more entrenched drinking patterns.²⁵⁸

The majority of alcohol-related harms in the elderly appear to be in those with an established drinking history²⁶⁰ as, to some degree, alcohol damage is cumulative.²⁵⁹ Some of the harmful effects of alcohol that tend to be associated with early-onset drinking include cognitive deficits and various psychiatric disorders. There are high frequencies of detectable cognitive dysfunction in elderly current and ex-problem drinkers,²⁵⁶ and alcohol use increases the risk of cognitive deficits.²⁶¹ Differentiating alcohol-related dysfunction from other types of dementing problems is quite difficult.^{256, 261} Cerebellar/cortical atrophy is often detectable in elderly problem drinkers.²⁵⁶ A history of heavy drinking in elderly men is associated with a five-fold increase in risk of psychiatric disorder.²⁶²

The interaction of prescribed drugs with alcohol is a significant issue for the elderly since many commonly prescribed medications in elderly populations interact adversely with alcohol.²⁵⁶ Older Australians living in the community are more likely than younger Australians to be heavy users of prescribed psychotropic drugs, mainly benzodiazepines, for the treatment of sleeping problems, anxiety and depression.²⁶³ Continual benzodiazepine use over one decade was found to occur in 16.6% of a sample of Australians aged 75 and over.²⁶⁴ The use of benzodiazepines has been associated with increased risk of hip fracture,^{265, 266} and increased risk of motor vehicle crash involvement.²⁶⁷ WHO recommend prescribing benzodiazepines cautiously to older populations, and to choose shorter duration benzodiazepines because they are less likely to accumulate in the blood, which increases the risk of harmful side effects.²⁰³ There is a significant literature on complications associated with various types of prescription medications. Australian studies have typically reported that around 15 to 20% of all emergency department admissions for the elderly are drug-related.²⁶⁸

4.5 Patterns of drug use risk and harm among Indigenous Australians

For every drug type considered, Indigenous people have higher rates of risky use than do non-Indigenous people, with correspondingly higher rates of drug-related harm.

4.5.1 Patterns of substance use

In 1994, the National Drug Strategy (NDS) conducted a national survey among 2993 Indigenous people in urban areas—population clusters of ≥ 1000 people, in which about 67% of Indigenous people reside—referred to as the NDSHS-Urban Aboriginal and Torres Strait Islander Peoples Supplement (UATSIPS).²⁶⁹ In the survey report, the results were compared to those of the general population in the 1993 NDSHS. No national survey has been undertaken since and these data still provide the best base-line estimates of the prevalence of substance use among Indigenous people.

Tobacco

The 1994 NDSHS-UATSIPS reported that similar proportions of the Indigenous and non-Indigenous populations had ever smoked; however, the percentage of Indigenous people who had smoked in the previous 12 months (54%) was 1.9 times greater than that among non-Indigenous people (29%).²⁶⁹ Indigenous people also reported taking up smoking at an earlier age than did non-Indigenous people. Numbers of cigarettes smoked were lower among regular smokers in the Indigenous population.

Local and regional reports on the prevalence of tobacco smoking from various communities in NSW,^{270–273} NT^{274, 275} and of school-aged children in NSW^{276, 277} and WA^{278, 279} show some variation by both region and gender but overall they confirm that prevalence of smoking among Indigenous people is about twice that among non-Indigenous people.

Alcohol

The 1994 NDSHS-UATSIPS confirmed the results of many other smaller studies showing that fewer Indigenous people are current drinkers; those who do drink do so less frequently, but more do so at high risk levels.²⁶⁹ Three times more Indigenous people stated they were ex-drinkers compared with non-Indigenous people. A pattern of episodic drinking associated with acute consequences was common, with 70% of male drinkers typically exceeding six standard drinks and 67% of females

drinkers typically exceeding four standard drinks, compared to 24% of males and 11% of females in the non-Indigenous population.²⁶⁹ Those who were more socioeconomically disadvantaged were more likely to engage in episodic risky drinking (and to smoke cigarettes) than other members of the Indigenous population.²⁸⁰

Studies of alcohol consumption among Indigenous people have also been conducted at local,^{272, 281, 282} regional,²⁸³ or Territory levels.²⁷⁵ The results show considerable variation. Some of this is likely to be a methodological artefact but as with smoking, the studies suggest geographic variation that is hidden in the aggregate 1994 Survey results. This is also suggested by a study of regional variation in per capita alcohol consumption in the NT.²⁸⁴

Illicit and injecting drug use

In the 1994 NDSHS-UATSIPS, 54% of Indigenous people reported ever having used at least one illicit drug, and 29% that they had used an illicit drug in the previous 12 months (compared to estimated percentages of 42% and 18% respectively among non-Indigenous people). Forty-eight percent reported ever using cannabis and 22% had used it in the previous 12 months (compared to 36% and 13% of non-Indigenous people). For many, cannabis was the only illicit drug used. Of the other illicit drugs in the previous 12 months, much lower (and therefore less reliable) rates were reported being 2% for hallucinogens, 1.7% amphetamines, 0.6% 'designer drugs', and 0.4% heroin.²⁶⁹

The 1994 NDSHS-UATSIPS also found that more Indigenous people than non-Indigenous people had either ever injected (3% compared to 2%) or currently injected (2% compared to 0.5%) illicit drugs.²⁶⁹ Taking this as a baseline estimate, Gray *et al.* estimated likely changes between 1994 and 2001 in WA.²⁸⁵ They examined changes in hospital admissions for all conditions caused by drugs other than alcohol or tobacco, opioid caused conditions, psycho-stimulant caused conditions and drug psychoses, hepatitis C notifications and drug offences. On the basis of increases ranging from 73% to 370%, they conservatively estimated that the prevalence of injecting drug use had increased by between 50% and 100%, the percentage of Indigenous people who had ever injected was probably between 4.5% and 6% and that the percentage of current injectors was between 3% and 4%.

Studies among non-random samples of Indigenous people who inject drugs have raised concerns about the young age at which injecting commences, and

about the safety of injecting practices. The median age at which people reported first injecting was 15 in Western Australia, 16 in Brisbane, and 17 in the Lower Murray.^{285–287} In the Lower Murray, 48% reported ever sharing needles and 28% that they had done so in the previous 12 months.²⁸⁷ Among those in the Brisbane study, overall 39% reported having shared a needle in the previous month, but among those aged less than 20 years 63% had done so.²⁸⁶ In the Western Australian study 43% acknowledged ‘normally’ sharing needles.²⁸⁵

Use of inhalants

In the 1994 NDSHS-UATSIPS, 7% of Indigenous respondents reported ever having inhaled solvents—either petrol (4%) and/or other inhalants (5%) such as glue. This was about 1.75 times the percentage reported among non-Indigenous people. The percentages reporting inhalant use in the 12 months prior to interview were similarly very low in both populations (0.8% compared to 0.7%).²⁶⁹ Rates of use, mostly occasional, are much higher among young people.^{276, 278}

The sniffing of petrol, as opposed to other volatile substances, is largely concentrated in small communities in Arnhem Land, Central Australia and the Goldfields region of WA.^{233, 288} In 1985, Freeman estimated that 49% of a population of 105 people aged 10 to 14 years at Amata in South Australia were either occasional or chronic sniffers.²⁸⁹ Similarly, in a non-random sample of 58 males aged 13 to 32 years (31% of the male population) in an Arnhem Land community 38% were current sniffers and 31% were ex-sniffers.²⁹⁰ More recently, it has been reported that in the year 2000 in the Anangu Pitjantjatjara Lands in South Australia, 6.2% of the total population and 12.2% of those aged between 10 and 34 years were engaged in petrol sniffing.²⁹¹

Kava

The use of kava is confined to a small number of communities in Arnhem Land. In a study of drug use patterns in the Northern Territory, Watson and her colleagues found that among a sample of 1764 persons aged ≥ 15 years 6.9% drank kava (10.5% of males and 3.6% of females).²⁷⁵ The percentages were higher among this Arnhem Land sample, but would be less among the total NT Indigenous population and considerably less among the Indigenous population of Australia as a whole.

Poly-drug use

As with non-Indigenous populations, there is a correlation between heavy tobacco smoking and heavy drinking among Indigenous people.^{269, 275} Petrol sniffers in Maningrida were also more likely to be cigarette smokers, heavy drinkers and light kava users than were non-sniffers.²⁹⁰ In Albany WA, 14% of 105 young people aged eight to 17 years and 48% of 15 to 17 year olds were ‘frequent poly-drug users’.²⁷⁸ High frequencies of poly-drug use have also been found among non-random samples of injecting drug users in both WA and SA.^{285, 287}

4.5.2 Harms related to substance misuse among Indigenous Australians

Indigenous Australians are acutely aware of many of the health and social consequences of excessive alcohol and other drug use. In the 1994 NDSHS-UATSIPS, 95% of the urban Indigenous population sampled regarded alcohol as a primary concern, 63% stated that alcohol or alcohol-related violence was the most pressing social concern, and 66% claimed it was the cause of most drug-related deaths in the Indigenous community.²⁶⁹ The report of the Royal Commission into Aboriginal Deaths in Custody stated that ‘Alcohol is having a devastating effect on the Aboriginal people of Australia’ (vol 2, p299).²⁹² This view was also put strongly in the report ‘Too Much Sorry Business’²⁹³ and has been made in the context of Cape York Communities, by Pearson.²⁹⁴

Mortality

Tobacco-related mortality is significantly higher among Indigenous than among non-Indigenous Australians. A WA study found the relative risk of tobacco-caused deaths for males to be more than double, and three to four times higher for females, compared with their non-Indigenous counterparts.²⁵⁴ In the NT it was estimated that 23% of Indigenous male, and 17% of Indigenous female, deaths were attributed to smoking.²⁹⁵ A number of reports implicate alcohol as a major cause of excessive Indigenous mortality.^{296–305} Unwin *et al.* estimated in WA, for the years 1983 to 1991, the rate of alcohol-related deaths to be five times higher among Indigenous males and between four and six times higher for Indigenous females. The leading causes of alcohol-related deaths among Indigenous males tend to be alcoholic liver cirrhosis, alcohol dependence syndrome and road injuries. Among Indigenous women, they were alcohol dependence, cirrhosis and assault. In 1983 to 1991 it was estimated that alcohol caused 9.6% of Indigenous deaths in WA.³⁰⁶

There are no national data available on mortality rates among Indigenous Australians related either to illicit drugs or volatile substance abuse.

Morbidity

Various local studies describe the impact of alcohol on clinic or hospital admissions within Indigenous communities;³⁰⁷ the excess of health problems among drinkers within Indigenous communities;²⁸¹ the association of problems such as recurrent seizures with levels of alcohol consumption;³⁰⁸ proportions of consultations or hospital admissions for alcohol-related problems that are about twice as high among Indigenous than among non-Indigenous patients;^{309, 310} and higher rates of alcohol-related hospital admissions.³¹¹

At the State or Territory level, Hunt cites NSW Health Commission data showing Indigenous to non-Indigenous hospital admission relative risks (RRS) of 9.3:1 for 'alcoholism', 3.0:1 for cirrhosis; RRS for other conditions known to be associated to some extent with alcohol consumption ranged from 1.5:1 for road traffic accidents to 16.7:1 for assault.³¹²

For WA between 1989 and 1991, the Indigenous to non-Indigenous RRS were 9.3:1 for males and 12.8:1 for females (23:1 in 1994) for alcohol-caused mortality. The main causes of alcohol-related admissions for males were assault, alcohol dependence and fall injuries; and for females were assault, alcohol abuse and alcohol dependence.³⁰⁶

Gray *et al.* reported significant increases in both hepatitis C notifications and crude hospital admission rates for conditions caused by drugs other than alcohol or tobacco among Indigenous people in WA between 1994 and 2000.²⁸⁵ In a larger WA study, Patterson *et al.* examined the incidence of first-time hospital admissions for illicit drug problems between 1980 and 1995. They found a dramatic increase during those years, from around half non-Indigenous rates to almost double. Largest increases were in admissions involving amphetamines, although increases were also seen with opiates, hallucinogens, cocaine and cannabis.³¹³

There are no population-based studies of morbidity due either to petrol sniffing or kava use. However, reported health problems associated with petrol sniffing include burns, weight loss, fitting, psychomotor impairment and psychosis.²³³ In the case of kava, clinical observational studies have documented problems such as weight loss, scaliness of the skin and allergic reactions among heavy users.^{314, 315}

Violent crime

Indigenous people are frequently victims of alcohol and other drug-related violence and crime. Almost half those Indigenous people interviewed for the 1994 NDSHS-UATSIPS reported that they had had goods stolen or damaged, more than a quarter reported being physically abused, and more than a third being verbally abused or threatened by someone influenced by alcohol.²⁶⁹ In Western Australia as a whole in the period 1994 to 2000, crude arrest rate for offences commonly associated with alcohol (liquor licensing, drink driving, against the person and good order) were 17.7 times greater among Indigenous than among non-Indigenous people; offences against the person were 20.2 times greater.³¹⁶ It has been estimated that between 60 to 80% of violent crimes by Indigenous people in remote areas of Western Australia are alcohol-related.³¹⁷

Family violence and child abuse

Family violence and sexual assault is common-place in drinking families and communities. Indigenous women are almost 40 times more likely than non-Indigenous women to suffer so-called 'spousal violence'.³¹⁸ If they live in the country their risks of violence are even greater.³¹⁸ While not all such violence is alcohol-related, much of it is.^{319, 320} All Indigenous submissions to the Aboriginal and Torres Strait Islander Women's Task Force on Violence cited alcohol as a major contributing factor to violence.³²¹

An inquiry in WA, completed in 2002, found that '... family violence and child abuse occur in Aboriginal communities at a rate that is much higher than that of non-Aboriginal communities' (p xxiii).³²² The authors of the report found that the causes of family violence and child abuse are complex but implicated alcohol and other drugs in the causal network.

Impact on families

Few Indigenous people have escaped the effects of drugs, particularly alcohol, on family and community life. Even those who drink moderately or not at all belong to families in which harmful drinking has led to neglected children, under-nutrition and lack of parental supervision.^{321, 323} For many young people reared in heavy drinking households their nearest adult models are people who spend much of their lives drinking, intoxicated, in gaol, or connected to violence and crime.^{321, 324} These environments pose serious challenges for children's schooling and social development, and there is some evidence that boys

may be more severely affected because of the relative absence of positive male models.³²⁵ In fact, many Indigenous people who have quit drinking did so because of the impact of their lifestyles on their children and grandchildren.³²⁶

Injecting drug users in Western Australia reported that their drug use caused strains on their partner and sexual relationships, conflicts with their parents and children and breakdown of friendships. They also acknowledged the anguish that their drug use and its consequences caused to members of their families.²⁸⁵

In their review of petrol sniffing interventions, d'Abbs and MacLean cite various studies that document the problems that petrol sniffers cause to their families and communities. These include parental distress, and intra- and inter-familial conflict.²³³

Suicide

Although Indigenous suicide is commonly associated with incarceration,^{292, 327} for more than a decade before the publication of the report of the Royal Commission of Aboriginal Deaths in Custody high frequencies of alcohol-related Indigenous suicides had been documented in various populations.^{281, 309, 328} Then as now, Indigenous suicides are more likely to occur outside police custody. Recent data from South Australia, Western Australia and the Northern Territory indicate that age-specific Indigenous suicide rates are higher than those of the non-Indigenous population for all age groups up to that of 40 to 44 years.³²⁹

Hunter's detailed analysis of Indigenous suicide in the Kimberley region of Western Australia over a thirty year period demonstrated that more than three-quarters of all suicides between 1957 – 1989 were heavy drinkers from families in which drinking was the norm.³²⁵ Hunter also showed that there had been both a dramatic increase in the number of mainly young men who had taken their own lives and changing patterns of suicide over time. Indigenous suicide is sharply concentrated among young males and much more likely to involve hanging than any other method used by the general population.³²⁹

As discussed below, the relationship between suicide, alcohol and/or other drug misuse and mental health problems is complex. Higher rates of these problems among Indigenous Australians are all associated with the same underlying social determinants. However, the misuse of alcohol can exacerbate mental health problems and increase the probability that a person with such problems will commit suicide.

Social and emotional wellbeing

In the years 1998 to 1999, the Indigenous to non-Indigenous age standardised hospital separation ratios for mental and behavioural disorders were 2.0 for males and 1.5 for females. In the case of mental disorders due to psychoactive substance use, these ratios were 4.1 for males and 3.5 for females.³³⁰ In 1997 to 1999, in Queensland, South Australia, Western Australia and the Northern Territory, death rates from mental disorders among Indigenous people were twice those among non-Indigenous people; 78% of those deaths were attributed to psychoactive substance use.³³⁰ Such hospitalisations and deaths are likely to be a small proportion of a wider prevalence of mental health problems that are either treated in primary health care settings or not at all.

Many of the other problems associated with substance misuse—such as assaults, suicide, family violence—are, in many cases, indicators of underlying mental health problems. However, not all mental health problems among Indigenous people are directly attributable to substance misuse. As with non-Indigenous peoples, many people with mental health problems also have substance misuse problems that often reinforce and exacerbate each other.^{331, 332}

Culture and tradition

The relationship of alcohol and other drugs to Indigenous culture and tradition is complex. Some perceive a basic incompatibility between Indigenous culture and the use of substances such as alcohol.³²⁶ In a similar vein is the belief that drinking leads to a 'loss' of culture.³²¹ Against that view is the evidence that traditional culture continues within heavy drinking communities and conversely, that in those communities where dispossession and threats to culture from European settlement are less evident, alcohol and other drugs remain powerfully attractive.^{174, 326} We need to look more broadly, therefore, at the multiplicity of factors that influence drug use in these communities.

Economic costs

Indigenous communities have much higher rates of un- and under-employment, poverty, poor housing and other social infrastructure. In these circumstances, the diversion of proportions of income significantly higher than the national average to alcohol and tobacco—and probably for other substances as well—has severe consequences for both users and their kin.^{269, 321}

4.6 Patterns of drug use risk and harm among culturally and linguistically diverse (CALD) Australians

Almost a quarter—23%—of the Australian population, a total of 4.4 million people, is born overseas, 9% from mainly English speaking countries and 14% from non-English speaking countries.³³³ Australian research generally suggests that young people born overseas and from at least some non-English speaking backgrounds are less likely to use illicit drugs.^{123, 334, 335} However, generalisations cannot be made to all cultural groups in all areas. For example, pockets of problems have been identified and there are highly visible problems of heroin use in some areas among South East Asian youth.^{336, 337}

There has been much discussion about the use of alcohol, cigarettes and other drugs amongst different immigrant groups, the most comprehensive of the Australian studies being those conducted by the Drug and Alcohol Multicultural Education Centre (DAMEC).^{338–342} These studies show that there are differences in the use of alcohol, tobacco and other drugs amongst some ethnic groups, but these differences may be due to confounding variables such as socioeconomic and marital status.

Table 4.4 compares people from CALD populations with the general population using 1998 NDSHS data.

Table 4.4 shows that that in 1998, people with a CALD background were less likely to consume alcohol, smoke tobacco, or use any illicit drug than other Australians.

Some methodological difficulties are found when addressing the use of alcohol and other drugs in ethnic communities. It is very difficult to accurately define differential membership of ethnic groups for research and statistical purposes. Two standard ways

by which ethnic groups are defined is by country of birth and by whether they or their families originate from a country where English is not the first language. There are problems in that the second and subsequent generations will be registered in formal, large scale surveys and in the census by country of birth.³⁴³ This, however, implicitly assumes that being of Chinese background is a defining characteristic irrespective of whether people are born in China or Hong Kong or Australia. Some studies have shown that alcohol use and mortality, where at least a proportion of deaths can be attributed to alcohol, tobacco and other drug use, can be consistent into the second generation,^{344–350} but other studies have shown there to be changes into the second generation.^{343, 351}

An important confounder is socioeconomic status,^{352–357} which has a clear demonstrated relationship with both alcohol and cigarette use.^{358–363} Rather than factors to do with the country of birth, it may be socioeconomic variables that better explain alcohol, tobacco and other drug use. The socioeconomic status of immigrants may well differ, depending on migration policy. For example, the more recent shift towards business migration and a reduction in family reunion is reflected in more affluent immigrants coming to Australia.³³³ It has also been shown that socioeconomic variables change towards those of the Australian born the longer immigrants are resident in Australia.³⁵¹

A further potential confounder is religion and also the extent of religious engagement.^{364, 365} In addition to nominated identification with a certain religion, the extent to which one engages in the ceremonies of that religion is important.^{344, 365–367}

The two key variables that emerge from the literature as being important predictors of alcohol and cigarette use are acculturation and education. Acculturation increases the likelihood that alcohol consumption will remain similar to that of one's ethnic group.³⁶⁸ Education predicts lower cigarette smoking for African-Americans as well as

Table 4.4 Drug usage in non-English speaking backgrounds from 1998 NDSHS (p50)¹⁸⁴ (general population figures parenthesised)

Substance	Never used %	Ever used %	Used in past year %
Alcohol	38 (10)	62 (90)	50 (81)
Tobacco/cigarettes	62 (35)	38 (65)	12 (61)
Cannabis	93 (61)	7 (39)	3 (18)
Any illicit drug	84 (54)	16 (46)	8 (22)
Any illicit drug other than cannabis.	87	13	7

Caucasians, the suggested mechanism being that education assists access to health messages.³⁶⁹

Ethnicity and drug use does not appear to be a significant public health concern. Most identified studies report lower rates of use of various drugs in most ethnic minorities.¹⁸⁴ It is possible that the differences in the use of alcohol, tobacco, and other drugs amongst some ethnic groups may be as much due to different sociodemographic profiles (e.g. socioeconomic status, marital status) as cultural factors. If this is the case, then ethnic-specific prevention programs may be more appropriately targeted at the broader structural determinants of health and the general risk factors for drug-related problems rather than drug use-specific approaches.

4.7 The association of drug use and mental health problems

Rates of substance use are strikingly higher in patients diagnosed with a mental illness of some form.³⁷⁰ There is evidence of two-way causal relationships such that persons with pre-existing mental health problems are more likely to use a range of drugs for purposes of self-medication³⁷¹ and also that substance use can exacerbate symptoms of some mental disorders.^{178, 372} Extended use of stimulants such as amphetamines and cocaine can precipitate a psychotic episode in someone with no previous history of such conditions. It also appears that heavy cannabis use can precipitate psychotic symptoms, especially in persons with a predisposition towards schizophrenia.³⁷³ Heavy use of alcohol has been found to exacerbate pre-existing anxiety disorders and elevate the occurrence of agoraphobia and social phobias.¹⁷⁸ Retrospective, prospective and experimental studies all indicate that alcohol can reduce fear and anxiety in the short-term but over days and weeks, drinkers' tendencies to experience these unpleasant emotions are exacerbated.¹⁷⁸ Similarly, there have been reports of people who have become dependent on benzodiazepines experiencing panic attacks for the first time.³⁷⁴ A recent major review conducted for WHO has found that the strong association between alcohol dependence and depression significantly involves alcohol dependence preceding depression, more often than the reverse.³⁷⁵ A significant health concern is the dramatically elevated rates of smoking seen in mentally ill patients, especially those with a psychotic illness.³⁷⁶

The major source of information on patterns of occurrence of mental health problems and substance use in Australia is the National Survey of Mental Health and Well-being (NSMHWB) conducted in

1997. This survey was conducted in three stages involving: a large-scale population survey, a second study on children aged four to 17 years, and a final component studying low-prevalence mental health disorders. The data have been analysed and presented by a number of different scientists.^{179, 377}

Seventeen percent of Australians will have a mental disorder (using ICD-10 diagnostic criteria) in any 12 month period according to the NSMHWB data. Although substance use can be defined as a mental health disorder, this figure does not include substance use disorders.³⁷⁷

The NSMHWB presents information on the prevalence of substance use disorders in people with co-occurring mental health disorders. These figures can be seen in Table 4.5 below:

Table 4.5 Co-occurrence of substance use and mental health disorders¹⁷⁹

Disorder	Men %	Women %
Substance use disorder	11.0	4.4
Anxiety disorder	7.1	12.1
Substance use in anxiety disorder	28.0	14.0
Affective disorder	4.1	7.4
Substance use in affective disorder	34.0	16.0

Table 4.5 shows that men were more likely than women to have substance use disorders or co-occurrence of other disorders with substance use disorders. Women were more likely than men to have anxiety disorders and affective disorders.

People with psychotic illnesses demonstrate elevated rates of substance use. Extensive research has been conducted to identify the Australian prevalence of substance use in people with a psychotic-spectrum mental illness,¹⁹⁶ and to compare this to an appropriate age-matched control group. (Table 4.6)

Table 4.6 Prevalence of substance use in people with a psychotic disorder (Data – NSHHWB)¹⁹⁶

Substance use	Psychotic %	Gen. pop. %
Current tobacco	60.0	23.0
Daily alcohol	21.5	15.0
Weekly cannabis	22.6	6.8
Psycho stimulants in last year	9.2	1.3
Opiates in past year	5.1	0.6

Table 4.6 shows that rates of every category of substance use were higher for those with a psychotic illness than for the general population.

Individuals with antisocial personality disorder are significantly more likely to have alcohol abuse and dependency problems and are significantly more likely to be aggressive whilst intoxicated.³⁷⁸

4.8 Patterns of drug use, risk and harm among police detainees and prisoners

The rates of drug use amongst those who are arrested have been extensively assessed as part of the DUMA project.²⁰² DUMA compiles self-report interview data and urinalysis results from detainees in a range of police lockups across Australia. These data are used to provide information about the nature of drug use in those involved in crime.²⁰² It is a highly sensitive instrument and can provide rapid information on changes in drug consumption trends amongst police detainees. DUMA tests for amphetamines, (including phenethylamines), benzodiazepines, cannabis, cocaine, methadone and opiates.²²¹ Urinalysis detection of drug use is skewed by the fact that different drugs remain detectable for differing degrees of time following drug consumption. ATS can be detected up to two to days after use, as can methadone. Cocaine and opiates can be detected for two to three days only. Benzodiazepines vary greatly and can be detected from two to 14 days after use. Cannabis is especially persistent and can be detected up to 30 days after use in some circumstances.²²¹ Alcohol use is not tested but is part of the self-report questionnaire.

Table 4.7 shows the proportions of DUMA male and female respondents who tested positive to a range of drugs, in 2001.

Table 4.7 Rates of positive tests in DUMA 2001²⁰²

Drug	Males %	Females %
Amphetamines	30	35
Benzodiazepines*	21	33
Cannabis	57	57
Opiates**	17	28

* Could be legal use

** Pharmaceutical analysis determines that 82% of those testing positive for opiates are likely to have used heroin in the 48 hours prior to being detained

Data on the prevalence of substance use among prisoners (rather than detainees) is available from the Drug Use Careers of Offenders (DUCO) study, a random sample of 2135 sentenced male inmates in Queensland, WA, Tasmania and the Northern Territory, conducted in 2001. The following rates of drug use were reported (Table 4.8).

Table 4.8 Rates of drug use in sentenced male offenders in DUCO³⁷⁹

Drug	Ever use %	Regular use %
Any drug	99.3	97.8
Alcohol	96.4	80.7
Tobacco	90.0	82.8
Any illicit drug	82.8	71.9
Cannabis	80.6	62.7
Any illicit other than cannabis	67.9	55.3
Amphetamines	58.0	42.8
Hallucinogens	52.5	24.1
Heroin	44.5	28.2
Benzodiazepines	41.6	23.6
Cocaine	32.3	17.5
Methadone	20.1	10.5
Inhalants	19.8	4.1

Table 4.8 shows that rates of drug use in this population are much higher than in the general population. The rate of use of illicit drugs other than cannabis is particularly high: over half of this population were regular users of illicit drugs other than cannabis.

Harms: it is difficult to study and quantify the rates of drug use and drug-related harm experienced in Australian prisons. Obtaining access to inmates, representative samples and reliable estimates of behaviours are all intrinsically more difficult within the prison system.³⁸⁰ Illicit drug use in prison is a serious concern not only because the drugs used are illicit, but because of the risk of spreading BBV diseases. Although drug injecting occurs in prisons, the most frequently detected drug in prisons is cannabis.²⁰⁰

Injecting drug use is common in Australian prisons, as it is worldwide.^{380, 381} Risk behaviours for BBVs (such as sharing needles) are also very common. On a worldwide basis, rates of HIV and hepatitis C are higher in prisons than in the general population.³⁸¹ Roughly a third of Australian prison entrants test positive for hepatitis C.³⁸⁰ Less than 1% of prisoners test positive for HIV.³⁸⁰ This is reflective of the low prevalence of HIV in the Australian population and

in Australian injecting drug users, and the high prevalence of hepatitis C in injecting drug users.

A review of studies of injecting in Australian prisons reports that over 50% of all injecting drug users in each study reported injecting drug use while in prison.³⁸⁰ About 25% continue to inject while in prison and about 90% of those who continue to inject share injecting equipment. Access to clean injecting equipment is very limited. As many as 66% of those who enter the prison system have hepatitis C.³⁸²

Rates of transmission of hepatitis C within Australian prisons are not known. Identifying the location of viral transmission down to a prison is particularly difficult as the majority of inmates are on short sentences and are transient, making it very difficult to identify in later years if any BBV infections occurred in the prison or in the community.³⁸⁰

4.9 Impacts on the broader community

4.9.1 Drug use and crime

One of the major impacts of drug use—both legal and illegal—on the community is crime, both in terms of economic costs and social costs, which include loss of amenity in areas where street drug use and drug-related crime is perceived to be prevalent.³⁸³ The quantification of the extent to which drug and alcohol use is associated with crime varies according to the way it is defined. A parliamentary report noted that if only illicit drug-related crime and intoxicated crimes were included, approximately 10 to 12% of crimes were drug-related.² A broader definition, which includes crimes committed by drug users as well as drug-related crimes committed by non-drug users, estimates that 70% of all crime is drug-related,² and this figure is frequently cited. It does not, of course, indicate the extent to which drug-related crimes are caused by drug use.

Recent Australian data indicate the extent to which persons in police and correctional custody are drug users, and the types of crimes that they commit. The Drug Using Careers of Offenders (DUCO) study, a 2001 study of prisoners in Queensland, WA, Tasmania and the Northern Territory, found that in a sample of approximately 2000 male prisoners, almost three-quarters of the sample were regular users of illicit drugs, and 55% were regular users of illicit drugs other than cannabis. Over 80% used alcohol regularly. The most serious offence (MSO)

of the majority (58%) was a violent crime and the MSO of 18% was a property crime. All of the other crime types were MSOs for fewer than 10% of the sample.³⁷⁹ These figures, however, reflect the nature of offences for which people are incarcerated more than they do the offending patterns of the population.

The Drug Use Monitoring in Australia (DUMA) study is a monitoring study of police detainees that collects data every three months, in police lockups. Between 1999 and 2001, over 5000 male and female detainees were interviewed in four police lockups: two in Sydney, and one each on the Gold Coast and in Perth. In this sample, two-thirds had a lifetime prevalence of use of heroin, ATS and/or cocaine, and around 40% had used at least one of these drugs in the past month. Their most serious current offences were property (33%), driving (27%), breaches (21%), violent (19%), drug and disorder (11% each).

The nature of the relationships between use of specific drug types and offending is considered in more detail below.

Alcohol

Australian and international studies have established that alcohol is significantly associated with crime, particularly violent crime.³⁸⁴ The causal link in alcohol consumption and violence is beyond dispute. Many studies suggest that alcohol is involved in 40 to 50% of violent crime and a lesser but substantial proportion of other crimes. Meta-analysis of experimental studies show that alcohol consumption results in a measurable increase in aggressive behaviour, which may account, at least in part, for the relationship between alcohol and violent crime—but this is not the only mechanism. The relationship is a complex one and there are multiple contributory and causal mechanisms, including the characteristics of the drinker, the effects of alcohol, the drinking environment, and the cultural expectations surrounding alcohol and violence. Alcohol tends to increase the likelihood that people will respond aggressively or violently, and increases tendencies towards risk taking.³⁸⁵

Most alcohol-related violent crimes are committed by men—particularly young single men—and this elevated rate is not entirely explained by higher rates of drinking. Alcohol-related crime is associated with deviance, power concerns and attitudes, and expectations that aggression will be more acceptable if alcohol is involved. Violent crimes are disproportionately associated with drinking in licensed premises, and alcohol-related criminal

behaviour is more likely in social settings where more than one person is intoxicated.³⁸⁵

The Australian National Alcohol Indicators Project (NAIP) has reported twice on alcohol-related violence. The research group found that in 1997, 124 deaths were attributable to alcohol-caused violence, 4381 years of life were lost prematurely due to alcohol-caused violence and 26 882 hospital bed days were attributable to alcohol-caused violence.¹⁹⁵ In a later report it was estimated that in 1998/99, 8661 people were admitted to hospital from alcohol-caused assaults in Australia. In addition, 62 534 serious alcohol-related assaults were reported to the police. Of the hospital admissions, 74% were male and two-thirds were aged 15 to 34 years. Non-metropolitan areas had higher levels of alcohol-related assault than metropolitan areas. Most jurisdictions showed relatively steady trends in alcohol-related violence from 1995/96 to 1998/99. It was concluded that levels of alcohol-related violence had not declined in Australia despite community concern, the proliferation of Alcohol Accords and the introduction of harm reduction strategies into legislation.³⁸⁶

It is clear that the community is significantly impacted upon by alcohol-related crime. The 2001 NDSHS found that 26.5% of the community reported having experienced alcohol-related verbal abuse, 4.9% had experienced alcohol-related physical abuse, and 13.7% were put in fear by a person under the influence of alcohol.²² Studies of Sydney street crime have concluded that 77% of street incidences (which includes offensive behaviour, assault, offensive language, malicious damage, domestic violence and noise complaints) involved alcohol.³⁸⁴ Detailed analysis of NSW police records demonstrates that a wide range of assaults and offensive behaviours are alcohol-related and these are often associated with drinking, in particular in licensed premises.³⁸⁴

Illicit drugs

The nexus between illicit drug use and crime inevitably raises the question of which comes first—illicit drug use or crime. This is critical for policy in terms of whether crime control or drug control measures should be pursued when dealing with illicit drug use amongst the criminal justice population. The criminological literature suggests that crime comes first, but the picture is complex because drug-using criminals are not a homogeneous group.³⁸⁷ DUMA data shows that while there are significant correlations between detainees charged with a violent and/or a property

offence and use of heroin and/or amphetamines, and the correlation between heroin and property offending is highest and consistent across different locations, the overlap between illicit drug use and criminal activity is not perfect. Most police detainees do not test positive to an illicit substance. However, there is support for an escalation model: drug-related offenders start committing crimes before they start using illicit drugs but use of such drugs becomes part of the lifestyle and can lead to dependency that increases the need to commit crimes to support their drug use.³⁸⁷

There are high rates of crime amongst injecting drug users. The IDRS found that more than half of a sample of almost 1000 injectors had engaged in at least one criminal activity in the previous month; most commonly drug dealing (39%) and property crime (20%). Almost half (44%) had been arrested in the previous year, usually for the same offence types.²⁰¹

The strongest link between illicit drugs and specific crime categories is in regard to heroin and property offending.¹⁹³ Injecting drug use, in general, is an expensive practice and heroin use is particularly expensive. Heroin-using property offenders commit more crime than non-using property offenders, and those who spend the proceeds on obtaining drugs typically commit further crimes.¹⁷⁵ The price of heroin makes it very difficult to sustain a pattern of dependent use from a full-time income²²⁹ let alone from unemployment benefits, which is relevant given that there is a very high rate of unemployment among heroin users.²⁰¹ A 1998 Australian review²²⁹ reported that in a sample of 202 heroin users, 70% were involved in acquisitive property crime and that illicit income accounted for 82% of income in the week before the study. The authors estimated the total cost of heroin-related crime as between \$535 million and \$1.6 billion per year.²²⁹ However, more than half of heroin users had committed crimes, most typically property crimes, before commencing use of heroin.²²⁹ Similarly, in the DUCO study it was found that, on average, offending commenced before the first illicit drug purchase.³⁷⁹

A survey of incarcerated property offenders³⁸⁸ also found a strong link between opiate use and property offending; and in DUMA it was found that 93% of property offenders had tried illicit drugs, 85% had used them in the past six months, 53% stated that they were addicted to illicit drugs, 41% blamed illicit use for their offending, and 26% stated that they were 'hanging out' for illicit drugs at the time of their offence.³ However, recent analysis of

DUMA data reveals that although it is common belief that most crime, particularly property crime, can be accounted for by ‘drug dependent’ persons, property offenders were more likely than others to report that they were dependent on drugs; more than half of them did not report being dependent.³⁸⁹

In terms of violent crime, concern is often expressed about the association between aggression/violence and use of ATS.²²⁰ A specific extension to DUMA interviewed detainees at the East Perth site who had used amphetamines in the past year. These detainees reported strong associations between criminal behaviour, being aggressive and/or using physical force whilst intoxicated or withdrawing from amphetamines, but it is not clear whether there were causal links between these activities.²²¹ As noted above, the 2002 IDRS found that methamphetamine users reported aggression among other side effects of use.²⁰¹

While it has often been alleged that steroid users are prone to violence there is only weak indirect evidence to support this claim. While it appears to be true that steroid users experience higher levels of aggression than normal, there is no evidence that steroid use is actually associated with increased risk or rates of violence.^{207, 210, 212} Petrol sniffing is also associated with violence and anecdotal reports frequently note very aggressive behaviour whilst intoxicated.²³³

The use of illicit drugs is associated with the cost of legal sanctions to users, their families and their communities. Most of the research in this area relates to the legal and social costs of cannabis convictions.¹⁷³

Almost 80% of arrests related to illicit drugs are related to consumption rather than sale or provision.¹⁸⁴ The majority of criminal justice resources allocated to drug use are utilised by minor first-time cannabis offenders, who, apart from their cannabis use, are in all respects a non-criminal section of the community. An Australian review found that the recording of a criminal conviction for experimentation with cannabis use, or even the cultivation of small amounts of the drug, was a cost far out of proportion to the seriousness of the offence.³⁹⁰ Other research suggests that many of the significant and demonstrably real harms associated with cannabis use are the direct consequences of involvement with the legal system.³⁹¹ A cannabis conviction can lead to negative employment consequences, further problems with the law, negative relationship consequences, and accommodation consequences.¹⁷³

4.9.2 Sexual assault

There is a significant link between sexual assault and alcohol,³⁹² although, again, untangling causality is difficult. Sexual assault and alcohol consumption, by both victim and perpetrator, co-occur at a high frequency—typically, either both victim and perpetrator were drinking, or neither was drinking. Approximately half of sexual assaults are committed by men who had been drinking, and approximately half of victims report that they were drinking at the time—drinking alcohol lowers an individual’s capacity to resist sexual assault.³⁹²

A number of risk factors for sexual assault have been established:

- general, heavy alcohol consumption,
- expectancies that alcohol increases aggression and reduces sexual inhibitions,
- agreement with stereotypes that women who drink are available, promiscuous or appropriate targets,
- belief that alcohol is an excuse for socially unacceptable behaviour.³⁹²

Alcohol also enhances aggressiveness and increases the chance that a perpetrator will misperceive a woman’s behaviour as indicating consent or acceptance of sexual advances. At the proximal level, alcohol reduces the ability to evaluate risk, and motor impairments reduce the ability to resist effectively.³⁹²

The use of intoxicating drugs in sexual assault (so-called ‘date rape’) has occasioned some recent community concern. The Australian Federal Police reported more than 70 cases of drug-facilitated sexual assaults, which usually involved Rohypnol (the best-known brand of flunitrazepam), or similar substances. Rohypnol now contains a blue dye to make drink spiking more difficult; however, flunitrazepam remains available under the brand name Hypnodorm (which does not contain dye). Flunitrazepam was placed on Schedule 8 of the Drugs and Poisons Schedule in 1998, partly due to concerns about its use in rape cases. GHB has been reported internationally as used in cases of rape and sexual assault. It dissolves easily in water, is not visible in solution although it does have a salty taste, and rapidly produces stupefaction. There is a very small difference between the recreational dose and the dose required to stupefy.¹⁶⁵ There are some reports about ketamine being used in the same way as GHB.¹⁶⁵

This area is a distinct gap in the literature. It is not possible to make any sort of definitive comments upon which drugs are used, the frequency of such sexual assaults, or any other comment about the use of intoxicant drugs in rape.

Domestic violence

In the Women's Safety Survey conducted in 1996, 6.2% of Australian women reported that they had experienced physical or sexual violence from a male perpetrator and 23% of married women or women in de facto relationships reported violence (undefined) from their partner at some stage during the relationship.³⁹³ Being a victim of violence has significant flow-on effects other than the physical harm suffered. Women who have experienced domestic violence experience a range of problems at a higher rate than the general population; including anxiety, depression, sexual and gynaecological problems.³⁹⁴

Substance abuse, especially alcohol abuse, is strongly associated with domestic violence. It has been estimated that between 25% and 50% of men who were physically abusive to their partners had substance abuse problems.³⁹⁵ If other preconditions for domestic violence are met, and in men who are already predisposed towards domestic violence, alcohol intoxication increases the risk of violence.³⁹⁵

Alcohol consumption also plays a role in increased risk of victimisation. Intoxication increases: the risk of being a victim of domestic violence, the risk that the partner will be drinking at the time of violence, and the chances of physical injury.³⁹⁵ A recent parliamentary committee, however, asserted that there were multiple causes of domestic violence and that attributing causality or responsibility solely to alcohol consumption was inappropriate and inaccurate.²

4.9.3 Public safety and amenity

There is no doubt that many in the Australian community believe that problems associated with substance use and abuse are associated with significant harms to the social fabric. Loss of amenity, noise, litter, vandalism, aggression, petty crime, violence and road safety issues have all been found to be concerns to the community that are associated with alcohol use.³⁹⁶ These harms are particularly relevant at the community level because they are personally experienced.

In terms of illicit drug use, the Capital Cities Lord Mayors made a statement on illicit drugs.

Users of the 'hard' drugs tend to gravitate to the major cities, both because of the ready availability of the drugs in cities and because of the attraction, to them, of the drug 'culture' in which they find comfort. The Councils of major cities inevitably face special problems in dealing with the situation in which drug users find themselves. They face resentment that builds in the community from awareness of the drug problem and its negative impact through crime. They must also deal with disturbance of the normal trading environment for businesses which arises when illicit drugs are used and traded openly and their impact on normal amenities in the streets for residents and visitors. There is also resentment at the substantial costs borne by the community as a result of the drug problem. (p61).³⁸³

A common theme, noted in this statement, is loss of amenity. There is a perception that the community has lost access in part to its public places, because of perceived threat or perceived presence of substance use or some of its undesirable sequelae such as discarded syringes, high crime rates, public drunkenness/intoxication or public violence.³⁸³

Highly visible drug use and high perceived availability of drugs in a community have been shown to increase the risk that youth will subsequently engage in harmful drug use.¹⁰ The visibility of a local drug use scene, particularly injecting, is also often associated with the level of concern experienced at the local community level. For example, visibly intoxicated people loitering in order to obtain drugs and the discarding of drug use paraphernalia has been associated with elevated levels of community concern in a given area.³⁹⁷ Equally, street dealing has been documented to have an adverse impact on local communities and nearby small businesses.³⁹⁸

4.9.4 Impacts on families

Families often feel powerless to deal with the drug use and related problems of other family members. They find drug use difficult and painful to accept, and many deny it until the evidence is too obvious to ignore at which point, not knowing what to do, they panic.³⁹⁹

Much of the literature on young people's drug use focuses on the family transmission of drug use, and children in families with dysfunctional drug use. An alternative view, however, is that parents, and other family members, are the victims of stress associated with family members using drugs in ways that are disturbing to the rest of the family.⁴⁰⁰ In one of the few studies to examine this perspective, 50 close relatives of identified problem drug users were interviewed and 35 individual problematic behaviours posed by the drug users identified.

These ranged from physical violence and verbal aggression, to stealing, lying, being manipulative and/or behaving in an embarrassing way in front of others.⁴⁰¹ A further study, in which 270 affected family members were interviewed,⁴⁰² found that family members generally adopt one of three broad mechanisms to cope with such behaviours in a significant other: tolerating, engaging and withdrawing. The authors speculate that these coping positions may represent universal ways of responding to dysfunctional drug use and associated problematic behaviours, but that particular coping positions may be more naturally adopted according to the nature of the relationship between the drug user and their significant other. (See also section 8.2.2. 'Assisting parents concerned by youth illicit drug abuse').

There are a number of agencies assisting families to deal with dependence or overdose deaths in their families, and representing their views. A concern is that low numbers of parents access support services or education groups. The failure to attract parents in need may be due to a difficulty in anticipating the barriers that parents might experience in accessing services.⁴⁰³ Most of the Australian programs designed to support parents and other family members affected by the drug use of a family member do not appear to have been formally evaluated.

4.9.5 Impacts on the workplace

The precise contribution of licit and illicit drugs to work-related problems (either productivity or safety) is largely unknown.^{404, 405} Equally, the contribution of the after-effects of alcohol use and prescription drug use is poorly defined.^{404, 405}

Absenteeism, productivity, accidents and injuries, job satisfaction, employee turnover, the social climate of the workplace and the image of the company have been identified as critical factors that may be influenced by the level and pattern of employee alcohol and other drug use.^{405, 406} There is a considerable amount of literature on alcohol and other drug use, and work but systematic reviews of the area consistently conclude that the empirical evidence is poor and does not well inform decision making as to beneficial responses.^{405, 406} Overall, the scientific literature regarding the prevalence and nature of alcohol and other drug-related harm in the workplace is equivocal and fragmentary.

The drug making the most significant contribution to drug-related harms in the workforce is undoubtedly alcohol.^{404, 405} The contribution of illicit drug use to workplace-related harms is often overstated.^{404, 405} Alcohol intoxication is inherently more disabling than intoxication with most illicit drugs.^{404, 405} There is also a higher baseline prevalence of alcohol use.

Patterns of use and harm in the workforce will reflect those of the community where the workforce is located.⁴⁰⁷ English *et al.* give an aetiological fraction of zero for illicit drugs and 0.07 for alcohol and occupational injury in Australia.⁴⁰⁸ The impact of illicit drugs on workplace safety and productivity would appear to be small and insignificant based on available evidence.⁴⁰⁵

There are consistent associations demonstrated between alcohol and drug use and higher rates of absenteeism; however, the evidence base is not strong enough to demonstrate causation.⁴⁰⁵

4.9.6 Impacts on road trauma

Alcohol

The most significant drug in regard to road trauma is alcohol. Driving whilst under the influence of alcohol was responsible for 418 road deaths and 7789 hospitalisations in 1997.⁴⁰⁹ The cost of a road fatality was estimated at \$750 000, and the cost of an episode of hospitalisation \$132 000. This equates to a total cost of around \$1.3 billion in 1997.

It has been estimated that between 1990 and 1997, 31% of all driver and pedestrian deaths were alcohol-related. These statistics do not include passengers injured by drunk drivers.⁴⁰⁹ The majority of alcohol-related road deaths occur between 10 p.m. and 2 a.m. on Fridays, Saturdays, and Sundays.⁴⁰⁹

Nationally, there was a downward trend in alcohol-related road deaths between 1990 and 1996. The majority of these declines occurred in the first few years and were broadly mirrored by declines in per capita alcohol consumption at a national level.⁴⁰⁹ There was no such decline evident for non-alcohol-related road injuries.

Young people are greatly over-represented in alcohol-related traffic morbidity and mortality. Of all alcohol-related serious road injuries, 52% occur in people aged 15 to 25 years.⁴⁰⁹ The average age of a person killed on the road in an alcohol-related crash is 27.5 years.

Cannabis

Cannabis reduces driving ability under controlled conditions; in simulators it reduces motor skills, reaction time and coordination. However, cannabis consumption alone also decreases driving speed and risk taking behaviour.^{215, 216, 410} There is substantial epidemiological evidence that cannabis use is not associated with an increased risk of fatality, and it has been speculated that this is due to a more cautious driving style in those affected.¹⁶⁶

It has been hypothesised that the lack of any apparent evidence that cannabis smokers are more likely to be in road crashes is related to their increased levels of caution. A study by Robbe measured real world driving performance on a variety of tasks, and reached the conclusion that cannabis smokers exercise greater caution than normal and are able to compensate for its adverse effects when driving.⁴¹¹ It has been noted that while alcohol-affected drivers over-estimate their ability and do not attempt to compensate, cannabis-affected drivers under-estimate their ability and do attempt to compensate by driving more slowly, paying more attention, and being more cautious.⁴¹²

Other reports have also found that low doses of cannabis produce a lesser degree of relative impairment in driving skills under controlled environments than does a blood alcohol level (BAC) of 0.04, which is legal. A high dose of cannabis produces a decline in skills and road-tracking ability that is less than that seen with a BAC of <0.08.⁴¹²

While the overall impact of cannabis use in isolation on driving safety appears to be very small, there are some circumstances where it is likely that cannabis consumption increases risk. This includes crisis situations where the driver would be under considerable stress, prolonged monotonous driving and operation of heavy machinery.⁴¹²

The majority of scientific reviews in this area conclude that cannabis use alone does not appear to contribute to motor vehicle accidents;¹⁶⁶ however, cannabis use in conjunction with alcohol use is highly dangerous.

Drug combinations

A significant contribution to research on the role of cannabis in traffic accidents has been made by techniques utilising culpability analysis—the retrospective examination of fatal road crashes to ascertain the fault attributable to each of the drivers involved. A major study⁴¹³ provided a great deal of useful information. Taken in conjunction with autopsy data on the presence of drugs in the

bloodstream, these methods can be used to examine the effects of drug use in fatal road crashes. These studies demonstrated that alcohol is by far the strongest contributor to road crashes, even after taking into account the prevalence of alcohol use versus the prevalence of other drug use. The group of drivers having both cannabis and alcohol in their bloodstreams was also significantly more likely to be in a crash. Overall, the drugs or drug combinations found to be significantly associated with crash culpability were alcohol, alcohol and cannabinoids (cannabis), and alcohol and benzodiazepines. Benzodiazepines taken alone also approached significance. No other drugs or drug combinations were found to be associated with significant culpability, including cannabinoids only, no drugs or alcohol, stimulants only, stimulants and cannabinoids, benzodiazepines and cannabinoids, or any other combination of drug type.^{215, 413}

Drug driving by police detainees⁴¹⁴

A specific analysis of DUMA data from 1999 to 2000 looked at the extent of drug use among traffic detainees, who were defined as any detainee who was being charged with a driving-related traffic charge. Generally, it was found that their drug use patterns were similar to those of other DUMA respondents, but that 55% tested positive to cannabis and 37% to multiple drug use. Compared to traffic detainees who tested negative to all drug classes, drug positive detainees were younger, with less education, and more likely to have been arrested in the previous year particularly for traffic-related offences. The report noted that these detainees were not representative of the driving public, and concluded that roadside screening, random testing and compulsory blood testing were all needed as strategies to control drug driving.

'Dance drugs' and driving

A major review conducted on English and European literature in an attempt to assess the use of so-called 'dance drugs' (as defined by the authors to include amphetamines, cannabis, LSD and ecstasy) concluded that there was little evidence to indicate that this was a significant problem at present. No Australian literature addressing this question was found.²⁴⁴

Stimulants and truck driving

Between 25 and 50% of truck drivers are believed to use stimulants of various kinds to stay awake⁴¹² and one Australian study found that 21% of a sample of dead truck drivers had stimulants (licit and illicit) in their bloodstream.⁴¹² There have been concerns raised in the past that persistent stimulant use can

exacerbate fatigue, with the driver rapidly becoming fatigued once the stimulants have worn off. As it is fatigue that is believed to be a major causal factor in truck driving fatalities, this remains an issue of some concern.⁴¹² Generally, culpability analysis reveals that truck drivers are less likely to be at fault in a fatal accident than car or motorbike drivers and so, overall, this population appears to demonstrate a good road safety record.⁴¹²

PART 3

SOCIAL DETERMINANTS, RISK AND PROTECTION FACTORS

CHAPTER 5: SOCIAL DETERMINANTS OF HEALTH AND DRUG USE

5.1 Summary

The link between poor health and disadvantage is now beyond dispute. While the precise means by which deprivation causes ill-health is still debated, few disagree about the importance of this relationship. Similarly, there is a clear relationship between alcohol and other drug use and social factors, such as unemployment, low income and insecure housing. A variety of evidence has associated drug-related harm and poor health with low social cohesion. There is a complex relationship between these broad social determinants and individual risk and protective factors, which means that some individuals do better than others on all health indicators, including drug misuse, despite their material deprivation. Furthermore, these relationships are more pronounced for some drug types where they have more adverse outcomes than others. In fact, there is evidence that income is positively related to tobacco use among young people, and to volume of alcohol use among the general population. Overall, the evidence base for the social determinants of drug use is such that researchers and policy makers need to plan and implement a wide range of interventions that acknowledge some of the social origins of poor health and risky healthy behaviours at all levels—from the macro-social to the individual.

5.2 Introduction

Explorations of the links between social conditions and health have a long history dating to at least medieval times in Europe, expanding under the rubric of ‘social medicine’ in the 17th and 18th centuries and including ground-breaking work by people such as Percival, Snow and Engels in the 19th century, which illustrated the impact of specific features of urbanisation and industrialisation on the health of the poor, in particular.⁴¹⁵

More recent work in this tradition has arisen since the publication of the Black Report in 1980: a UK Government sponsored review of the socioeconomic determinants of health that demonstrated clear differences in the health profiles of occupational groups with those in higher occupational categories experiencing better health. Since then, researchers have attempted to explore the connections between social factors and health, and policy makers have struggled to conceptualise how these findings could be translated into health policy.^{416–419}

One recent very comprehensive example in this tradition is a UK study that explored the impact of social factors such as income distribution, below average household income, education, employment, housing, homelessness, public safety, transport, ethnicity and sex, on health indicators

such as mortality, years of life lost and morbidity.

This study concluded that a diverse range of measures and determinants of health were associated with inequalities by socioeconomic group, ethnicity and gender.⁴²⁰

While there is general agreement about the impact of socioeconomic variables on health, the mechanisms by which this occurs and the strength of these relationships is disputed.^{421, 422} For instance, studies of the association between individual income and health show a consistent relationship between income level and morbidity and mortality, with those on the lowest income experiencing the highest mortality rates and lowest health status. These relationships have been confirmed for the United States, Britain, many European countries and Australia among males and females at all life stages.⁴²³ Those claiming that this individual income inequality translates to poorer health for the whole population, however, have been challenged by recent discussions of the relationship between income inequality and population health, with one reviewer claiming that new data on income inequality for 16 Western, industrialised countries show that ‘...the association between income inequality and life expectancy has disappeared’ (p1).⁴²⁴ This has renewed debate about the nature of the relationship between inequality and health.^{421, 422, 425} In particular, it has focused attention on the way in which the contextual effects of inequality—

such as low social status, for instance—rather than income inequality, *per se*, may influence health outcomes.^{421, 425}

5.3 The social determinants of health

There are various models of the social origins of health, but most postulate interconnected levels of social determinants of health from the most broadly social to individual pathophysiologic/biologic pathways, including: macro-social factors (political economy, the cumulative effects of historical factors, social institutions, culture); distal social connections (neighbourhood and community); proximal social connections (family and friends); individual characteristics (socioeconomic, psychosocial and behavioural); genetic characteristics (human biology and genetics); and pathobiology (pathological biomarkers).^{415, 418, 420, 426–428}

One of the challenges in these models is determining the way in which broad social categories such as class, for example, impact on health. The most common means of measuring the effects of class on health and other outcomes is to convert class to an index of socioeconomic status (SES). SES is used in most empirical research by combining assessments of income, education and occupation levels; then sorting the outcomes into low, medium and high categories, often with reference to geographical areas of residence. SES tends to cluster in communities to create an environmental risk; as an individual risk factor, however, it can be influenced by government policies through, for example, employment and welfare programs.⁴¹⁹ Although SES can be used to indicate levels of economic inequality, it is generally a more narrowly defined concept than class, but it is not uncommon for the two terms to be used interchangeably in the research literature.

Much of the research on the social determinants of health and illness has focused on the effects of socioeconomic gradients on health. The term ‘gradient’ in this context refers to an increase or decrease in an outcome variable that relates to wellbeing and is linked to an SES measure such as income, education or occupation.⁴²⁹ Those supporting the argument for an unambiguous relationship between material factors and health point to the international evidence base that suggests that it is not the total wealth of a country, but inequalities in the distribution of wealth within it, that determine health status.^{429, 430} Here the

concepts of material or absolute deprivation and relative deprivation can be differentiated. For instance, countries with low levels of economic development may suffer from absolute deprivation, while relative deprivation exists within and between different classes or ethnic groups within developed countries. Thus it is argued, it is not the wealthiest developed countries that invariably have the best health outcomes but rather those countries that have more egalitarian social structures.⁴³¹ The effects of absolute and relative deprivation can be observed in the socioeconomic gradient in health. Societies with inequitable income distributions tend to have steep socioeconomic gradients in health, whereas societies with more equitable income distributions tend to have shallower gradients.⁴³⁰ Thus, for example, a middle class person in a society with a steep socioeconomic gradient may have worse health than someone of lower SES in a country with a shallow gradient. This phenomenon has been observed across all SES levels and research from the United States has demonstrated that this variability cannot be solely explained by differential access to health care, for example.⁴³⁰

However, the relationship between equality and health may not be as straightforward as previously thought. A recent study of occupational class mortality in European nations found no correlation between greater equality in income and equality in health.⁴³² Similar findings that refute the association between income inequality and population health have been reported for Denmark, the United States and Japan (cited in ⁴²⁴). This evidence has led to renewed interest in the way in which the broad social environment, rather than simply income, influences health outcomes.⁴²¹

The social environment can influence health and wellbeing through structures such as social supports and levels of social cohesion. The concept of social capital has increasingly been identified as a mechanism by which to explain relationships between social factors and health outcomes.⁴³³ Social capital has been defined by Kawachi as ‘those features of social organisation—such as the extent of interpersonal trust between citizens, norms of reciprocity and density of civic associations—that facilitate cooperation for mutual benefit’ (p1187).⁴³⁴ The influence of social capital is potentially broad, impacting on government functioning and democracy, prevention of delinquency and crime, promotion of successful youth development and the ability to decrease socioeconomic health disparities. Social capital, so defined, has also been found to influence individual

health, even after controlling for variables such as income, education level and risk behaviours such as smoking.⁴¹⁹

The effects of gender and ethnicity are not separate from class but form part of the web of social relations that create or deny access to wealth and the availability of life chances. With respect to gender, for example, in addition to sexually specific diseases such as breast, cervical and prostate cancer, many diseases occur in different patterns in women and men. Although female life expectancy in the developed world is greater than that of males and the causes of death are similar, more women than men report illness and seek treatment. Men experience higher rates of life threatening conditions and risk factors such as alcohol abuse and dangerous driving, while women have higher prevalence of painful non-lethal conditions such as migraines and arthritis. Women reportedly suffer more psychological distress but men commit suicide at greater rates.⁴³⁵

Factors that interact with gender and impact on health include differences in exposure to risk factors such as smoking; the nature of gender-linked work; lower exercise rates among women than men; higher participation rates by men in risky activities such as dangerous driving and contact sports; higher levels of physical aggression in men but higher rates of victimisation in sexual and domestic assault in women. Many of these differences interact with other social variables such as class and ethnicity.⁴³⁵

Ethnicity may also impact upon health if a particular group has a history of both relative poverty and informal and formal social exclusion.⁴³⁶ Social exclusion may include: exclusion from civil society by law or regulation (such as the detention of asylum seekers in Australia); limited or no access to social goods for groups with particular needs (e.g. bilingual education for Indigenous children); exclusion from social production because of being labelled deviant or in need of control (e.g. injecting drug users); and economic exclusion from normal social consumption (e.g. restricted visas for certain classes of immigrants). Gay and lesbian people—particularly the young—may feel isolated by their sexuality, so much so that they are a risk group for suicide.⁴³⁷ Social exclusion thus adds to the burden of other social determinants that may be experienced by ethnically diverse populations, such as the disproportionate concentration of some groups (such as Indigenous peoples) in low SES categories.

It is not simply broad social categories such as class, gender and ethnicity that have an impact on health. Religious affiliation and observation also appear to influence health outcomes. Membership of particular religious groups (such as the Mormons and Seventh Day Adventists) and frequent religious attendance appear to confer health advantages, with the more devout enjoying lower mortality rates for a number of major causes of death.⁴²⁸

The links between these social determinants of health and the pathways in ill-health at the individual level are complex. For example, high stress levels can impede immune system functioning while impoverished social networks, low-self esteem, high rates of depression, anxiety, insecurity and a poor sense of control all impact on quality of life.⁴³¹ Some societal level factors such as lack of access to education can affect life chances.⁴³⁰ In turn, the stress associated with such inequality can impact on emotional wellbeing at the individual level.⁴³⁸ Negative emotional states impact on psychological health manifesting in problems such as depression, anxiety, anger and hopelessness, and on physical problems such as coronary heart disease and possibly cancer, although the causal factors for these associations are complex.⁴³⁸

Social epidemiology has primarily studied SES and the characteristics of individuals (psychological and behavioural) associated with risk, protection, vulnerability and resilience.^{415, 439} Despite the social determinants of health that confer poor health outcomes on categories of people, some individuals in those categories maintain good health and wellbeing. Researchers are exploring how at each level, social factors, significant life events and transitions can either 'increase vulnerability and the probability of an adverse outcome (*risk factors*) or reduce the risk or promote resilience and increase the probability of positive developmental outcomes (*protective factors*)' (p217).⁴³⁹

The relationship between macro-social factors and risk and protective factors is complex. The outcomes of broad social determinants may also feed back and, in turn, influence those broader social determinants. For example, risk and protective factors have been demonstrated to undermine attainment of individual capacities for cognitive and physical performance, and to undermine the effectiveness of education and economic access. From this perspective, risk and protective factors may also be important predictors of subsequent variation in class mobility at the individual level.

5.3.1 Australian research

Australian research on the social determinants of health is growing.^{440–443} Research by Turrell and Mathers shows that Australians at the lower end of the socioeconomic hierarchy suffer more ill-health, and that health differences by SES are apparent at all ages. Morbidity and early mortality are more concentrated in people with lower SES, and Australian Bureau of Statistics (ABS) data show that the morbidity gap is widening for certain conditions (coronary heart disease, lung cancer and motor vehicle accidents in men aged 25 to 64). On the other hand in women, colorectal cancer, breast cancer and melanoma are associated with higher SES.⁴⁴⁴

A 1992 Brisbane study examined the Person Years Of Life lost by SES and found that Australians in the lowest SES lost 50% more years of life than people in the highest SES group.⁴⁴³ People from disadvantaged groups are more likely to go to hospital and seek medical consultations because their health is worse than that of more advantaged groups, but they are less likely to take advantage of preventive care and screening services.⁴⁴⁴ In addition, Kawachi, Kennedy and Wilkinson found that as unemployment tends to cluster geographically, this leads to impoverished neighbourhoods with commensurate problems including lack of role models, difficulty finding work through contacts, high crime and delinquency rates, as well as restricted access to good housing, prejudice from others and non-conformist attitudes; resulting overall in marginalised sub-cultures.⁴⁴⁵ Single parent females are also increasingly concentrated in poorer neighbourhoods, and adolescent employment rates in low SES communities are 80% of those in high SES communities.⁴¹⁹

Less is known in Australia of the way in which gender and ethnicity impact upon health, although there is a clear gendering of life expectancy with women living almost six years longer than men. The fact that the gap between Australian male and female life expectancy has narrowed in the past two decades indicates the social rather than constitutional nature of these changes.^{428, 435}

As indicated above, ethnicity can affect health if relative deprivation is implicated. This means that Australian ethnic and minority groups with histories of long-term social exclusion and material marginalisation are more likely to suffer the worst health. The most extreme example, of course, is that of Indigenous people whose health is universally

regarded as dismal. The starkest indicator of this is the much lower life expectancy—between 15 and 20 years—among Indigenous people. Much research and countless government inquiries have linked poor Indigenous health to the colonial past, which has left a legacy of disadvantage and related ill-health.^{325, 446, 447} Apart from the injustices entailed, it is necessary to understand the history of colonialism that has shaped the government policies and institutions that confront Indigenous people, and is at the root of the social inequalities faced by them today. This inequality is reflected in a number of key social indicators. Fewer Indigenous people have post-secondary qualifications, are employed, or occupy professional, managerial or administrative occupations, than the general population. Median individual income among Indigenous people, aged 15 years and over, was 74.1% of that among their non-Indigenous counterparts; and among Indigenous families, median income was 68.2% of that of non-Indigenous families.⁴⁴⁸ While there is considerable evidence of the absolute material deprivation suffered by Indigenous people, much less research has explored the impact of material inequality on psychosocial factors.

The social and economic circumstance of migrants is more complex, depending upon their country of origin, English language competence, and recognition of qualifications and skills in Australia, among other factors. The SES of immigrants may well differ, also, with migration policy. For example, the more recent shift towards business migration and a reduction in family reunion migration is reflected in more affluent immigrants coming to Australia.³³³ In general, migrants in Australia have lower levels of morbidity and mortality than the general population, largely due to the screening processes of the post-war immigration program. The longer their residence in Australia, both socioeconomic variables and health status tend to converge towards those of the Australian born.^{351, 449}

5.3.2 Social determinants and causation

The evidence from both overseas and Australia is unequivocal in identifying social factors as determinants of health status. Where debate exists, it is about the relative importance of particular social factors and about the links in the causal chain from the macro-social to the individual. As Wilkinson points out with respect to the first issue, it is not simply that exposure to poor material environments leads to ill-health but also that relative income, which dictates one's social position, is also

influential.⁴⁵⁰ It is factors such as low social status, poorly developed social networks and lack of control over one's work environment that may be more potent contributors to chronic stress and hence ill health, than simply lack of material goods.⁴²¹ These different emphases on absolute versus relative deprivation have been identified as 'materialist' and 'psychosocial' perspectives in the literature (p54).^{415, 438}

Others have developed this argument and claim that the focus on material deprivation has neglected the way in which cultural influences mediate health outcomes through psychosocial factors.⁴³⁸ Eckersley, for instance, writes about the way in which socioeconomic factors are amplified or moderated by cultural determinants, in much the same way as psychosocial pathways are posited for the social determinants of health. Culture mediates the way individuals encounter and make sense of the world, and their experiences of inequality are also cultured.⁴³⁸ This conflating of culture with social categories such as ethnicity or class has been attributed to the dominance of epidemiology, with its origins in medicine, in the social determinants of health debate. Anthropology, on the other hand, is more likely to define culture as the system by which people make meaning of their lives.⁴⁵¹

As Eckersley points out,⁴³⁸ the importance of culture to health appears in some of the classic epidemiological studies, ranging from the analysis of the association between exposure to Western influences and increased coronary heart disease in Japan, to explaining low mortality rates in Roseta, Pennsylvania as a consequence of social cohesion and egalitarianism. However, this work has been overshadowed, Eckersley and others claim, by the contemporary focus on socioeconomic inequalities. What is the impact of modern Western culture on health? Eckersley suggests that the relationship between culture and wellbeing is interactive and inter-related. Four facets to Western culture that have positive and negative effects on wellbeing are: consumerism, individualism, economism (in which society is viewed primarily as an economic system with choices based on economic considerations), and postmodernism (characterised by the loss of over-arching truths in favour of relativism, ambiguity and fragmentation).⁴³⁸ Harm to health and wellbeing may occur through the promotion of anti-social values, moral ambivalence and the contradictions and tensions between cultural ideals and social realities. In this way, 'cultural influences can interact with structural conditions to modify their social effects' (p61).⁴³⁸

Eckersley applies this analysis to the health and wellbeing of young people and contrasts epidemiological emphasis on socioeconomic inequality to postmodern sociological literature and its focus on the cultural qualities of contemporary life. It is the structural changes to family, work and education, he suggests, that has had more impact on young people.⁴³⁸ He cites research that indicates that among young people there is a general pessimism which suggests that they may be more influenced by individualisation and insecurity related to the unpredictable nature of modern life. Young people from privileged social backgrounds are concerned about failure and their uncertain futures, while those from disadvantaged backgrounds may regard the risks they face as 'personal and individual, rather than structural and collective' (p66).⁴³⁸

With regard to the second area of debate about causation, rather than simply describing associations between social factors and health—such as the strong gradient of health by income, for example—calls have been made for researchers to isolate causal mechanisms by which these associations occur, such as 'the causal contribution of income on health as opposed to income being a proxy/correlate for numerous other variables' (p28).⁴¹⁶ However, rather than enter into these increasingly arcane debates about causation, Najman⁴²⁸ suggests:

...we might usefully think of causes that are closer to (and more distant from) a health outcome. Rather than conceptualising the causes of disease in binary terms (something is or is not a cause), we can more usefully think of causal pathways with some causes distant from the outcome, e.g. poverty, others at an intermediate point, e.g. cigarette smoking, and others more proximate, e.g. cellular abnormalities (p75).

The point here is the emphasis on the many levels at which the social determinants of disease occur. Overstatement of the degree of methodological rigour required for any analysis of the relationship between social factors and health, at any level, should not inhibit attempts to demonstrate relationships between social determinants and health status.

5.3.3 Social determinants of drug use and harm

While the evidence for the social determinants of health in general is now extensive, and models of the social origins well developed, less research has been devoted to the way in which social determinants impact upon drug use. However, there is a considerable body of work that demonstrates an association between social

determinants such as unemployment, homelessness and poverty, and health-damaging behaviours, including drug misuse.^{363, 436, 452} Indeed, according to Jarvis and Wardle, the link between deprivation and health behaviour is strongest for alcohol and other licit and illicit drug use.³⁶³ Similar links have been found between social determinants including unemployment, poverty, family disadvantage and community and cultural factors, and crime.⁹ The relationship between drug use and crime will be discussed in a later section.

The relationship between deprivation and health behaviour has been consistently demonstrated for cigarette smoking, which is more frequent among lower SES groups, people living in rented dwellings, those without private transport, the unemployed and those living in crowded accommodation. There is also a gradient by education level and by marital status, with those who are divorced, separated or lone parents more likely to be smokers. The strength of this relationship led Jarvis and Wardle to propose a general law in Western, developed countries that, ‘any marker of disadvantage that can be envisaged and measured, whether personal, material, or cultural, is likely to have an independent relationship with cigarette smoking’ (p242).³⁶³

Disadvantage is not the only dimension in research on social variables that is associated with alcohol and other drug use. There is also a literature indicating that for some population groups, consumption is powerfully influenced by the amount of disposable income. An Australian study of schoolchildren, for example, found that personal income was a strong predictor of the number of cigarette packs smoked in a week.⁴⁵³ Being employed was also found to be a strong predictor of the volume of alcohol consumed by respondents to a large Western Australian survey.⁴⁵⁴ There is evidence from international and Australian data that economic downturns are associated with a significant reduction in per capita consumption of alcohol, as well as in the prevalence of serious alcohol-related harms—the recession in Australia in the early 1990s was associated with reduced alcohol consumption, reduced alcohol-caused deaths⁴⁵⁵ and alcohol-related road crashes.^{409, 456}

There is little research that elucidates the precise mechanisms by which social factors such as income, employment and education influence excessive alcohol and other drug use. Rather, health-damaging behaviours related to poor diet, inadequate exercise, cigarette smoking, excessive drinking and illicit drug use, appear to be

embedded in a complex network of social determinants and risk and protective factors.⁴⁵⁷ These behaviours are also mediated by cultural influences.^{438, 451, 458} An important question is whether or not broad social determinants such as class, gender and ethnicity maintain any determining influence on drug use after controlling for more proximal risk and protective factors. Available evidence supports the view that much of the influence of these variables is mediated by risk and protective factors.⁴⁵⁹

Drug use in Australia is not an isolated phenomenon but one of a range of risk behaviours with common social determinants, common risk and protective factors, and common outcomes. Class, gender and ethnicity are the major determinants of inequality in health outcomes but other influences are found in the sociocultural and physical environments. Developmental research has examined the direct influence of gender, ethnicity and class on youth drug use and also the potential for these factors to mediate and moderate the effects of other determinants of youth drug use.⁴¹⁹

Levels of risk and protective factors tend to differ considerably by class, gender and ethnicity. However, the determinant relationship between risk and protective factors and youth drug use, in particular, tends to be more similar than different across class, gender and ethnicity. Although there is some evidence that authoritarian parenting may have less adverse influences in some cultures, other risk factors tend to operate in similar ways.⁴¹⁹ It is possible that gender, for example, may influence the impact of some risk factors. Bond and colleagues have speculated that females may experience greater depressive symptoms in response to similar levels of peer and family conflict.⁴⁶⁰

Class or SES does not generally appear a strong predictor of youth drug use in Australian follow-up research.^{123, 461} However, there is evidence for a possible threshold effect such that conditions associated with extreme poverty may result in very severe drug use trajectories.¹⁰ In a graphic example using the New Zealand Dunedin birth cohort, Fergusson, Lynskey and Horwood demonstrated that when the focus narrowed on the 2.7% of youth experiencing the most severe behaviour problems early childhood development was characterised by in-utero insult (maternal smoking and drinking), birth complications, problems in infant care (low breast feeding, low infant care and poor parenting) and social instability through childhood (family breakdown and parental changes).¹²⁵ The family backgrounds of these children were characterised by

high levels of social disadvantage (teenage parents, low education, sole parents) and social disconnection (low rates of church attendance, and parent mobility).

Fergusson and his colleagues also found that increasing exposure to unemployment was associated with increasing risk of psychiatric disorders (which included nicotine and other substance dependence), independently of pre-existing family and personal factors.⁴⁶² Conversely, there is some evidence that being employed can impact negatively on substance use. For example, Spooner cites research showing that employed young people have higher levels of alcohol consumption.⁴¹⁹

Developmental research prior to the 1990s tended to find males had higher rates of adjustment problems and were more likely to become involved in harmful drug use.¹⁰ Through the 1990s Australian data suggested rates of involvement in drug use for girls had tended to equalise with those for boys.¹⁵³ Although these changes have been moderately large, the factors influencing the trends are poorly understood. One possible explanation may involve a tendency for families to use increasingly similar child rearing practices for boys and girls. The trends do suggest the potential importance of cultural influences in the determination of youth drug use behaviours.⁴¹⁹

The literature on risk and protective factors with regard to drug use and young people has been reviewed in this document. One Australian study reported that for adults being married, or in a de facto relationship, appeared to exert a protective effect on both volume and pattern of alcohol consumption.⁴⁵⁴ This finding concurs with a body of literature around treatment outcomes that consistently reports that persons with family supports and stable relationships have better outcomes for treatment.⁵ However, a review of social and demographic factors in the adult population could not be located and it is recommended that this should be a future research priority.

With respect to ethnicity and drug use the evidence is not clear-cut. Australian research generally suggests that adults and young people born overseas and from some non-English speaking backgrounds are less likely to use drugs.^{123, 334, 335} However, generalisations cannot be made to all cultural groups in all areas. For example, pockets of problems have been identified, such as heroin use among South East Asian youth in south-western Sydney³³⁶ and in Melbourne.³³⁷

The Victorian Department of Human Services has recently published a study of the involvement of ethnic communities in Victoria with illicit drugs.⁴⁶³ A major finding was that SES—manifest in high youth unemployment and low levels of literacy—more than ethnicity *per se*, was the major contributor to high risk behaviour and drug use in culturally and linguistically diverse communities. Family factors were identified as important mediators. These factors included lack of discipline for young people, unrealistic pressures on children to succeed, lack of communication in families, lack of effective parenting skills and supervision, and generational/cultural conflict.

Higher rates of drug use among some immigrant communities may stem from family isolation,³³⁷ family disruption associated with traumatic refugee experience,⁴⁶⁴ and/or loss of parental control over adolescents due to differential acculturation and role reversal.⁴⁶⁵ On the other hand, having rules and good parental supervision have been found to be protective against substance use among adolescents from some ethnic communities.³³⁶

The adverse health and social impacts of drug use, particularly alcohol, among Indigenous Australians has been attributed by most researchers to a broad range of social determinants. A comprehensive review of the relationship between excessive levels of alcohol misuse, related harm and structural factors is provided by Siggers and Gray.¹⁷⁴ Based on their own research and a detailed review of the literature, they describe the similar patterns of alcohol misuse and related harm among Indigenous peoples in Australia, New Zealand and Canada. They show that there is no evidence for the biological determination of these common patterns, and that social patterns of misuse are not explicable in terms of individual pathology. They also show that a range of cultural factors play a role in observed patterns of alcohol misuse. Some cultural factors mediate the impact of broader political and economic factors and others, such as the development of destructive drinking patterns, feed into a continuing cycle of poverty and disadvantage. However, the diversity among these Indigenous peoples precludes explanations based solely on cultural factors. The common patterns of alcohol misuse are related to the common experience among these Indigenous peoples of colonialism, dispossession and economic exclusion and their continuing consequences.

A concrete example of the determining role of colonialism and dispossession in Indigenous alcohol misuse is provided by Hunter.³²⁵ He describes

patterns of ill-health and alcohol consumption, and related harm, among Indigenous people in the Kimberley region of Western Australia. He links these to the colonial history of the region and to the forced exclusion of Indigenous people from their traditional lands following the Conciliation and Arbitration Commission decision granting equal wages to Indigenous workers in the pastoral industry, which came into effect in 1968.

Although it is not generally their main focus, a number of studies link substance misuse among Indigenous Australians to these social indicators. A joint publication by the Australian Bureau of Statistics and the Australian Institute of Health and Welfare (ABS & AIHW) summarised the results of the two most comprehensive national surveys of Indigenous people that both linked cigarette smoking to such social indicators.^{269, 280, 466, 467}

An extensive analysis of NATSIS [National Aboriginal and Torres Strait Islander Survey] data revealed that both Indigenous males and Indigenous females aged 15 and over who had completed at least year 12 at school were less likely than those who left school earlier to report that they smoked. Indigenous people in forms of employment other than Community Development Employment Projects (CDEP) (a work for social security entitlements program) were less likely to report that they smoked than those in CDEP scheme employment, the unemployed and people not in the labour force (Cunningham 1997). Similarly, in the NHS [National Household Survey], Indigenous adults aged 18 years and over from non-remote areas were less likely to report smoking if they were employed (49%) than if they were unemployed (63%) or not in the labour force (55%) (p53).²⁸⁰

As summarised by Ivers, two smaller studies have linked—or partially linked—tobacco smoking among Indigenous Australians to workforce and employment factors.⁴⁶⁸ The first, a study of 306 Indigenous and 553 non-Indigenous people in two Victorian towns, found that 66.9% of Indigenous males and 24.0% of non-Indigenous males were current cigarette smokers.²⁷³ When the analysis was confined to those not receiving a pension, benefit or allowance, the proportion of Indigenous males who were current smokers was reduced to 39%. However, a similar relationship was not found among Indigenous females. In the second study, Hogg reported that among a sample of 273 Indigenous people in New South Wales, the prevalence of tobacco smoking was 54% among those who were unemployed but only 27% among those who were employed.⁴⁶⁹

The ABS and AIHW publication also linked alcohol misuse among Indigenous people to education, employment and income.

An analysis of Indigenous drinkers aged 18 years and over in the NHS showed that those in the high risk category were less likely than low risk drinkers to have a higher educational degree and more likely to have left school before the age of 15, to be unemployed or not in the labour force, to earn the majority of their income through government pensions, to earn less than \$10,000 per annum ... Although the numbers of people in each category are small, the patterns are consistent in suggesting that high risk drinking among Indigenous people is more common among the socioeconomically disadvantaged (p55).²⁸⁰

In a study in Albany, Western Australia, Gray et al. found that among 105 Indigenous people, aged eight to 17 years, 15% were 'poly-drug users' (occasional users of some combination of tobacco, alcohol and cannabis) and 14% were 'frequent poly-drug users' (frequent users of some combination of tobacco, alcohol and cannabis and occasional users of volatile substances or other drugs). Among those aged 15 to 17 years, the proportion of frequent poly-drug users was 48%.²⁷⁸ Logistic regression analysis showed that among children aged eight to 14 years, those who were disaffected from school were 23 times more likely to be poly-drug users; and that among those aged 15 to 17 years, those who were unemployed were 13.5 times more likely to be 'frequent poly-drug users' than those who were employed, in training, or still at school.²⁷⁹

These socioeconomic factors are indicators of a complex network of structural determinants of substance misuse among Indigenous Australians that also includes institutionalised racism and the cultural and psychological impacts of colonialism and dispossession. Interventions that focus on economic inequalities alone will not prevent the misuse of alcohol and other drugs among Indigenous Australians. However, without greater focus on remedying these up-stream social determinants, the effects of other interventions will be critically circumscribed.

5.3.4 Social determinants, drug use and intervention

Interventions for drug misuse are based on a wide range of factors, some of which have little to do with the evidence base for health-damaging behaviours. Given what is now known of the relationship between social determinants and health status, including drug use behaviour, researchers and policy makers need to demonstrate that the recommendations they make for interventions can be linked to this research base.

Attempts have been made to model the way interventions may be targeted at each level at which the social determinants of drug use impact.^{6,7} For example, Lenton has adapted Holder's 'alcohol prevention conceptual model', which conceptualises prevention activities as being targeted at a number of the levels, from the macro-social (global, state and nation) to the individual. Lenton added to this the 'conditional matrix' of Strauss and Corbin,⁴⁷⁰ which can be represented as a series of concentric circles where each level corresponds to a different aspect of the environment. The resulting model for the prevention of alcohol and other drug problems contains levels that allow for differential prevention activities, mechanisms of action and context (Figure 1.1). Importantly, influences flow both down the model, from distal to proximal levels, and are fed back up the model from the proximal to the distal.⁶

The Public Health Systems model outlined in Chapter 1 illustrates how there are a number of political and economic mechanisms of action operating at global, national and state levels that can impact on drug availability, use and harm. These include: treaties, conventions, enforcement and policy coordination at the international level; the enforcement of policies, laws and regulations, taxes and excise on substances, and health and welfare spending at the national level; and, in addition to these other factors, licensing and education policy at the State level. There are also a number of prevention options available for intervening at these levels.⁶ For instance, the Health Inequalities Research Collaboration was established by the Commonwealth Department of Health and Ageing to create new knowledge leading to the reduction of health inequalities through research on policies and interventions.⁴⁴⁰

In terms of interventions that take account of developmental research on children and young people, there appears to be some consensus about the importance of developmental pathways in leading to problematic behaviour, investing in child-centred institutions and policies, and identification and manipulation of multiple risk and protective factors at different social levels and transition points (p72).⁴⁵⁷ Specifically, Cashmore suggests it is necessary to:

- intervene early in life and early in the developmental pathway,
- aim at reducing the accumulation of risk at multiple levels (child, family, community, society),

- use a coordinated approach that takes into account common risk and protective factors,
- make any interventions acceptable and accessible to the participants, including the children and the young people themselves,
- target transitions and prepare and support children and their families through transitions; and evaluate preventive interventions to learn what makes a difference and why (pp219 – 220).⁴³⁹

With respect to drug use, to take just one of the above it seems clear that a number of risk and protection factors are common to a range of adverse developmental outcomes and social problems that are frequently dealt with as separate domains, including school failure, teenage pregnancy, domestic violence and substance misuse (p221).⁴³⁹

One model pioneered in the US,¹⁰ and trialled in both the UK and Australia,⁴⁵⁹ focuses on community organisation or mobilisation and:

... involves the systematic identification and measurement of risk and protective factors in a selected community (utilising mainly official data and a standard questionnaire completed by adolescents), and the selection, implementation and evaluation of appropriate evidence-based interventions by a community prevention board.

The extent to which risk and protection factors that are inherently complex can be identified and measured is still problematic.⁴⁵⁷

5.4 Conclusion

There is now incontrovertible evidence linking poor health to disadvantage. Although debate will continue about the precise means by which deprivation causes ill-health, few disagree about the importance of this relationship. Similarly, there is a clear relationship between alcohol and other drug use and social factors, such as unemployment, low income and insecure housing, although much of the influence of these variables is mediated by risk and protective factors. A variety of evidence has associated drug-related harm and poor health with low social cohesion. There is a complex relationship between these broad social determinants and individual risk and protective factors, which means that some do better than others on all health indicators including drug misuse, despite their material deprivation. With respect to tobacco and alcohol, there is also a literature identifying some positive associations with income and employment. The issue of the extent to which alcohol and drug-

related problems are located within the disadvantaged sectors of Australian society will be discussed in the next chapter. In general, the evidence base for the social determinants of drug use is such that: researchers and policy makers need to plan and implement a wide range of interventions that acknowledge the social origins of poor health, and how poverty and associated disadvantage maintain this poor health and risky behaviours at all levels—from the macro-social to the individual.

CHAPTER 6: RISK AND PROTECTIVE FACTORS PREDICTING HARMFUL DRUG USE

6.1 Summary

This chapter examines current evidence for the developmental influences that lead to subsequent patterns of drug use that have a high likelihood of harm. Follow-up research studies provide information relevant to the antecedent factors that lead to drug use. Risk factors were defined on the basis of their tendency to independently predict involvement in early and heavy youth drug use. Protective factors were defined as influences that modify the effects of risk factors while not directly predicting drug use. Based on these definitions, effective harm minimisation strategies were defined as protective factors. The research summarised in this chapter highlights some of the major risk and protective factors influencing drug use over the course of development.

Inherited vulnerability (for males), maternal smoking and alcohol use, extreme social disadvantage, family breakdown and child abuse and neglect were amongst the earliest risk factors that increase the likelihood that children develop behavioural and adjustment problems and subsequently become involved in harmful drug use. From the age of school entry, early school failure, childhood conduct disorder, aggression and favourable parental attitudes to drug use all appear to be risk factors for drug use problems. From adolescence, low involvement in activities with adults, the perceived and actual level of community drug use, availability of drugs in the community, parent-adolescent conflict, parental alcohol and drug problems, poor family management, school failure, deviant peer associations, delinquency and favourable attitudes to drugs were all identified as risk factors for harmful drug use. Community disadvantage and disorganisation, positive media portrayals of drug use, adult unemployment and mental health were further factors strongly associated with harmful drug use. The evidence was unclear as to the role of childhood Attention Deficit Hyperactivity Disorder, intelligence, anxiety and depressive symptoms in the prediction of harmful drug use.

Early age protective factors included being born outside Australia, having an easy temperament, social and emotional competence, and shy and cautious temperament. Protective factors in adolescence included family attachment, parental harmony and religious involvement; and in adulthood, well managed drinking environments, and marriage.

Little is known of the risk and protective factors influencing the subsequent course and development of drug use in later life. The research at this stage is limited regarding the factors influencing Indigenous youth involvement in drug use.

6.2 Introduction

Earlier sections of this report identified patterns of drug use that exact high levels of economic and social harm. Regular tobacco use, alcohol abuse and alcohol dependence, frequent adolescent cannabis use, illicit drug use and poly-drug use have each been documented to lead to harm. In this section, we examine current knowledge of the predictors of these harmful patterns of drug use, drawing both on longitudinal research and intervention studies to arrive at judgements regarding the major influences

leading to drug-related harm. The main strategy in this chapter is to update previous literature reviews by examining a selection of well-conducted studies published over the past decade. Earlier literature is included where it is relevant to historical trends in risk processes.

6.3 Prevention science: a developmental pathways approach to prevention

There is a growing emphasis in Australian prevention programs upon a 'developmental pathways' approach. This approach, emphasised in Australian mental health⁴⁷¹ and crime prevention strategies,⁴⁷² aims to direct evidence-based investment to modify the early developmental pathways that lead to later problems. The approach has emerged through the synthesis of a range of scientific endeavour but draws in important ways on life-course development research, community epidemiology and preventive intervention trials.⁴⁷³ ⁴⁷⁴ In common with the broad area known as prevention science, the developmental pathways approach seeks to prevent health and social problems by identifying and then reducing the influence of factors that lead individuals and groups to subsequently develop health or social problems. The approach is based on techniques developed to prevent health problems within the fields of public health and epidemiology.⁸ Although an ultimate understanding of underlying causal processes is sought, in general this approach aims initially to understand the probabilistic relationship between early indicators and subsequent problems.

6.3.1 From drug use predictors to risk and protective factors

Drug use *predictors* are characteristics measured before the emergence of drug use behaviour and are statistically associated with an increased probability of subsequent emergence of the predicted behaviour. Predictors are typically identified using findings from follow-up (or longitudinal) research studies; however, in cases such as genetic research, alternative methodologies may be relevant.

By increasing understanding of the major factors that can be reduced in order to prevent health problems, the identification of *risk factors* has proven useful in public health. The terms predictor and risk factor are often used interchangeably. However, in the current document risk factors will be distinguished as a specific class of predictors that represent theoretically independent domains. Independence in this context relies upon, firstly, the ability to empirically distinguish the predictor as a unique measurement domain, and secondly, evidence that the risk factor predicts the target behaviour after adjustment for other known influences. Risk factors can also be further distinguished by their potential to be modified

through intervention. This emphasis on malleability distinguishes risk factors that have been emphasised in the current document as potential prevention targets.

Protective factors have tended to be loosely defined and are often empirically measured, as the opposite end of a risk factor. For the present purposes, protective factors were defined as a special class of predictors that act to moderate and mediate the effect of risk factors.¹⁰ To avoid confusion, it has been further specified that protective factors do not independently predict drug use behaviour, but are important due to their capacity to reduce the influence of risk factors. Where a purported protective factor has been shown to independently predict drug use behaviour (i.e. prediction is maintained after adjustment for other known risk factors), the interpretation used in the current document leads to it being reclassified as a risk factor. By avoiding ambiguity, the ground is cleared to make an accurate assessment of the factors that directly and indirectly influence the development of drug use.

Risk and protective factors are defined in relationship to the outcome being predicted, the developmental age, and the stage in the development of the behaviour being predicted. The timing of developmental events has important consequences and hence the age at which particular experiences and events occur is an important determinant of their developmental impact. For example, initiating alcohol use at the legal drinking age appears to have very different developmental implications than alcohol use initiated in childhood or early adolescence.

Harm minimisation has been an important framework guiding Australian drug abuse prevention efforts since the mid-1980s. Harm minimisation strategies include efforts to 'minimise the risk of harm from' (p123) drug use.⁴⁷⁵ Accepting that harm minimisation strategies do not necessarily influence drug use but rather reduce the risk of harm from drug use, it then becomes clear that many harm minimisation strategies can be defined as protective factors.

6.3.2 Risk processes

The current state of the science of prevention suggests that risk factors influence the course of development through their cumulative impact across time. This means that there is no single risk factor that lies at the heart of developmental problems. Rather, these problems can be regarded as having complex causes, or multi determination.

The more risk factors that persist over longer periods of time, the greater the subsequent developmental impact.^{476, 477}

From one view, the cumulative effect of risk factors operates somewhat like a snowball. According to this view, risk factor exposure early in life can impair the subsequent course of development and lead to a snowball effect, with subsequent risk factors tending to adhere and accumulate as a consequence of the earlier problems.⁴⁷⁸ So, for example, mothers' tobacco smoking may impede foetal development resulting in cognitive deficits that then lead to poor school adjustment. Poor school adjustment and school behaviour problems may lead on to social aggregation with other poor school achieving youth. From this perspective, the solution is to check the avalanche of risk by intervening at the top of the mountain, the earliest point in the course of development.

From a slightly different perspective, the cumulative effect of risk is more analogous to a snowstorm. According to this view, a child can withstand extreme weather for a brief period but over time the chances of illness through exposure increase. For example, a healthy child may withstand drug use in the peer group and community for a period but, over time, if this behaviour is common the chances of the child becoming involved in drug use increase. Both parents who are unavailable and bad experiences with teachers may increase the chances of the child becoming interested in drug use. The protective benefits of positive relationships with adults, observed even for children with damaged developmental pathways, are again suggestive of the potential to protect health in bad environments by reducing further risk exposure and providing protection (analogous to providing shelter in a stormy environment). From this perspective, solutions lie in improving social environments through the course of development,⁴⁷⁹ strengthening the child's capacity to survive risky environments and enhancing protective factors to reduce the impact of risk.

In attempting to explore the development of behaviour, an understanding of the sequencing of risk processes across the life span becomes important. At one point in development, a risk factor (such as early age alcohol use) can be studied as a predictor of subsequent behaviour (e.g. cannabis use). However, at an earlier stage in development the same factor may be seen as an outcome to be predicted by prior risk factors (e.g. childhood behaviour problems). In what follows we have attempted to organise the developmental

research by working forwards through the life stages. Beginning with early influences, we have attempted to identify the chain of development (pathways) leading to subsequent harmful drug use.

Identifying the independence of risk and protective factors requires that their positive prediction of drug use be maintained after adjusting for other influences operating at that age. Clearly until the influence of all alternative risk factors has been comprehensively examined, accepting that risk factors are independent remains tentative and open to revision as further evidence accumulates. In the current report if a risk factor maintained its effect after adjusting for a range of similar risk factors operating at the same stage of life and within the same domain (e.g. family, peer group) it was regarded to be independently predictive of drug use.

6.4 Quality of evidence

The major sources of evidence for identifying developmental influences on drug use have been longitudinal, self-completed, follow-up surveys. Depending on the stage of development, the respondents have either been children, adolescents or adults. In some cases, such as in research investigating early life influences, observations made by parents or professionals supplement child self-reports and are linked to reports collected later in life. This mixing of different sources of observation is one of the strengths of the existing knowledge base in developmental 'life-course' research. The capacity of follow-up research to classify behaviour based on multiple observations across time represents a further strength.

A major problem in follow-up research is attrition of participants with higher levels of risk. The studies selected for inclusion in the current review satisfied criteria suggesting the initial study participants were representative of the population they were selected from and the effect of selective attrition (loss to follow-up) on observed relationships between early and late events had been appropriately considered.

Although the issue has received insufficient attention, it is generally agreed that self-reports of children and youth are reliable and valid so long as responses are perceived to be confidential and questions are clearly worded and appropriate to the stage of cognitive development. There has been considerable previous work attempting to synthesise research into early childhood and adolescence.

Although there are some studies examining early adulthood, there has been little follow-up research

examining developmental processes later in adulthood. We have not been able to find follow-up studies examining Australian Indigenous and illicit drug-using populations. In these cases, the discussion centres on associations rather than risk factors and the conclusions rest on weaker evidence and hence are more speculative.

6.5 Prior to birth

A range of factors established prior to a child's birth have been shown to influence the likelihood of that child eventually becoming involved in drug use and of progressing to potentially harmful drug use.

6.5.1 Social disadvantage

Summary: Being born or raised in a family experiencing extreme economic deprivation is a risk factor for harm associated with drug use (1 longitudinal study).

The effect of social disadvantage on the development of drug-related harm is complex. Work in the well conducted New Zealand Christchurch cohort has associated severe social disadvantage with risks to healthy child development at a very early age; leading to a cumulative snowball of deficits that culminate in serious social and behaviour problems throughout life. However, there is also evidence from studies in the United States that children from higher socioeconomic status (SES) may sometimes have sufficient affluence and freedom to seek out, and engage in, new and novel drug use experiences. The tendency of the lifestyles of the wealthy and influential to lead social aspirations can result in the phenomena observed in Australia and other nations, where new patterns of drug use may be introduced and made fashionable through the involvement of people from higher SES. Lower SES is associated with less money and influence and hence, all things being equal, drug use is more likely to lead to undesirable social consequences for those with lower SES. This means that as drug use epidemics move into more disadvantaged groups, an increasing level of social costs may be observed. Problems associated with drug use can also explain downward mobility through the impact of drug use in lowering educational achievement and increasing exposure to unemployment and incarceration.

The Christchurch Health and Development study in New Zealand has documented some of the earliest predictors of drug use problems. In that study, low family SES from birth predicted more frequent cannabis use at 15 to 16,¹⁵⁶ higher amounts of

alcohol consumption and a tendency for alcohol-related problems at age 15.^{125, 480} Children born into families with a larger number of children tended to drink alcohol more frequently,¹²⁵ and experience more alcohol related problems by age 15.⁴⁸⁰ Each of these findings was maintained after adjusting for other known risk factors in childhood and adolescence.

For the small minority (2.7%) in the Christchurch cohort evidencing poly-drug use, concurrent with the most severe behaviour problems at age 15, early family backgrounds were characterised at birth and infancy by high levels of social disadvantage and social disconnection. These children were more likely to be born to teenage and or sole parents who had low education and low incomes, and these parents tended to be socially disconnected (low rates of church attendance and/or parent mobility).⁴⁸¹

However, evidence from other cohorts suggests that in some groups it is not low SES, but high SES, that predicts entry to drug use. In a cohort of US students interviewed in the early 1970s, higher levels of father's education at age 16 was an unadjusted predictor of more frequent involvement in illicit drug use at ages 24 to 25 for males.¹⁶² In a separate US cohort, females from higher SES backgrounds were more likely to engage in late emerging poly-drug use at age 16, in the mid 1980s.¹³⁵ In the follow-up of the Australian Temperament Project (a birth cohort of around 2400 followed from 1983, in Victoria) entry to age 15 poly-drug use, or illicit drug use, appeared to be occurring across the range of social backgrounds in the late 1990s.⁴⁶¹ In this study, SES appeared to have no direct or interactive effect on age 15 poly-drug use or illicit drug use. There are other Australian studies that show a similar trend, revealing that at a very broad level, drug and alcohol disorders are not associated with the level of education.³⁷⁷

The finding that harmful drug use is inconsistently explained by SES also arises in some other areas of child health research. A large follow-up study investigating the development of children in Canada noted that poor child outcomes were less well predicted by SES than by parenting. In that study, poor parenting was related to the SES gradient but also varied considerably across different levels of SES. At least 25% of children in the highest SES group showed developmental difficulties.⁴⁸²

The findings from the Christchurch cohort are in concert with an earlier review of findings from research conducted in the 1970s and 1980s that concluded that severe economic deprivation was a

risk factor for youth drug abuse.¹⁰ These findings fit with a substantial worldwide literature showing that for nearly all health conditions, the level of harm caused by that condition takes the form of a gradient, whereby the lowest SES groups experience the most harm and the level of harm reduces as SES increases.⁴³⁰ SES does not necessarily predict involvement in potentially harmful patterns of drug use, but it may increase the risk of experiencing such harm.

6.5.2 Family breakdown

Summary: Being born or raised in a sole parent household is a risk factor for more frequent drug use in adolescence (two longitudinal studies).

The last three decades have seen increasing rates of family breakdown in Australia and other countries. Families experiencing breakdown tend to suffer high levels of social disadvantage.

In well-controlled cross-sectional research in Western Australia, sole parent status appeared to increase the risk of youth maladjustment, independent of levels of family conflict.⁴⁸³ It is possible that sole parent households are at greater risk not because of the number of parents but because of the additional emotional distress and financial pressure under which those households are often placed, due to dual working and parenting roles and financial pressures.⁴⁷⁸

In the New Zealand Christchurch cohort, early family breakdown was associated with heavier alcohol use at age 14⁴⁸⁴ years and poly-drug use at age 15 years.⁴⁸¹ Family divorce and separation predicted more frequent cannabis use by age 15 years in the Victorian Adolescent Health Cohort (VAHC), a representative cohort of around 2000 youth followed from age 14 to 21 years with low sample attrition.¹²³

The influence of family breakdown on drug use appears to be independent of child behaviour problems, raising the possibility that a major component of the influence lies in the family management of adolescents. In the analysis of the VAHC, the influence of family breakdown on frequent mid-adolescent cannabis use was maintained after adjusting for markers of child adjustment problems, including age 14 involvement in antisocial behaviour, peer cannabis use, and earlier drug use (age 14 daily cigarette smoking and heavier alcohol use). The influence of family breakdown on age 14 alcohol use in the New Zealand cohort was also maintained after adjusting

for age 8 conduct problems and earlier age of first alcohol use.⁴⁸⁴

A recent evaluation of a parent education intervention documented success in reducing early adolescent poly-drug use. The success of the intervention was associated with the targeting of parenting groups that included a high proportion of sole parents.⁴⁸⁵

6.5.3 Birth outside Australia

Summary: Being born outside Australia is a protective factor, reducing frequent drug use in adolescence (1 longitudinal study).

A range of evidence suggests that being born outside Australia is associated with lower levels of adolescent drug use^{166, 334, 335} and lower rates of substance use disorders.³⁷⁷ There is evidence from one Australian study that the effect of non-Australian birth may not be direct but rather a protective (or mediating effect) resulting in less family breakdown, less involvement with drug using peers and lower rates of early age drug use. In the VAHC, fewer of the children born outside Australia were found to engage in frequent cannabis use by around age 15. This effect of non-Australian birth was no longer significant after adjusting for the influence of peer cannabis use, daily cigarette smoking, high dose alcohol use, frequent alcohol use, antisocial behaviour and divorced or separated parents.¹²³

6.5.4 Genetic influences

Amongst the earliest influences on youth substance use are genetic factors that interact with environmental influences to shape individual differences in drug use behaviours. Although knowledge is advancing regarding the role of genetic influences on drug use behaviour, there is still a great deal that is unknown. Available research suggests that it is unlikely that a single gene will be found to explain drug use behaviours.^{465, 486} It is more likely that a combination of genetic factors influence behaviour through their interaction with environmental factors. Childhood predictors of drug use considered likely to have some genetic component include behavioural problems and temperament. All things being equal, it is likely that more serious drug use disorders may have a higher genetic determination.⁴⁷⁷

6.5.5 Sex and gender

Summary: Being male is not a risk factor for adolescent drug use. The historical tendency for males to engage in more adolescent drug use appears to have been cultural (time-series analyses).

Summary: Males can inherit a paternal gene that is a risk factor for childhood externalising behaviour problems and alcohol abuse (and perhaps other drug abuse) (two longitudinal studies).

In many Australian studies, males are found to be more commonly involved in illicit drug use.¹⁶⁶ Although in the NDSHS lifetime use of injecting drugs was more common for males, for usage in the past 12 months there was no gender effect.¹⁷⁵ These trends are in line with evidence that in the late 1990s an increasing proportion of injecting drug users were female.

Internationally, there has been an increasing trend for females to take up alcohol use⁴⁸⁷ and to escalate in greater proportions to dependent use.⁴⁸⁸ In recent Australian cohorts, females have been demonstrated to engage in higher levels of potentially harmful poly-drug use relative to males. This was observed in the Victorian Australian Temperament Project (ATP) cohort for age 15 to 16 years poly-drug use in the 1990s.⁴⁶¹ In the late 1980s, a similar trend was observed in Brook's US cohort for late emerging poly-drug use at age 16 years, for females from higher SES backgrounds.¹³⁵

Findings from a number of studies report that males have a higher tendency for alcohol abuse and dependence. In a cohort of 449 in the Midwest of the US, the co-occurring pattern of alcohol and tobacco dependence symptoms was followed through five waves of data collection over seven years, from age 18 to 25 years. The study had little attrition, enabling the course of alcohol and tobacco dependence to be followed over time. Through this period, three trajectories of alcohol-dependence were identified. Chronic trajectories applied to 6% of the sample and involved stable, high levels of dependence across all years. Adolescent limited trajectories applied to 17% of the sample. Neither of these trajectories was associated with higher rates of tobacco dependence. However, in a further 7% of the sample, high levels of alcohol dependence co-morbid with tobacco dependence were noted. Being male was an unadjusted predictor of the more common forms of chronic and adolescent-limited, but not the co-morbid form of, alcohol dependence. In this study, the behavioural expression of alcohol dependence was indirectly predicted by family history but this effect was

mediated by favourable attitudes to alcohol use and individual characteristics of personality disorder and school maladjustment.¹²⁰

In the New Zealand Christchurch cohort, males had a greater risk for age 15 alcohol problems¹²⁵ and age 16 alcohol abuse.⁴⁸⁴ In a Finland cohort, males were also more likely to develop alcohol abuse by age 26 years.⁴⁸⁹

In the New Zealand Christchurch cohort, the finding that males were more likely to develop alcohol problems at age 15 years was maintained after adjusting for age at first alcohol use, lower family SES, parental alcohol/drug problems and parental perceived attitudes to alcohol use.¹²⁵ The finding that males tended to develop alcohol abuse at age 16 was maintained after adjusting for age 14 alcohol use and peer drug use.⁴⁸⁴

In work by McGue and colleagues in Minnesota,⁴⁹⁰ twin data have been examined and associations identified between parent and youth alcohol use, were found to have a larger genetic component for boys compared to girls. In this study, the behavioural expression of early alcohol use was argued to occur through a greater tendency toward childhood externalising behaviour problems for boys.

The VAHC noted males tended to engage in more frequent cannabis use by age 15 years. However, this effect was no longer significant after adjusting for the influence of earlier drug use, antisocial behaviour and the impact of parental divorce and separation.¹²³

Some studies have examined the possibility of different risk processes for females relative to males. There is some evidence that internalising disorders, such as anxiety and depression, may be more important predictors for female alcohol problems. In Finland, high social anxiety in females at age 8 years predicted higher rates of alcohol abuse at age 26, while anxiety in boys was associated with lower alcohol abuse.⁴⁸⁹ In an adult cohort in the eastern US, depression was found to predict female but not male progression to alcohol abuse and dependence two years later.⁴⁹¹

6.5.6 Parent and family drug use behaviours

Summary: Maternal smoking and alcohol use prior to birth, and environmental tobacco smoke are risk factors for impaired child development; this impairment initiates a pathway of poor child adjustment, leading to harmful drug use (see Chapter 3).

Summary: Drug use of parents and other family members from late childhood is a risk factor for early age initiation of the same drug, through modelling (three longitudinal studies).

As documented in Chapter 3, maternal smoking, alcohol and drug use prior to birth have important developmental consequences for children, extending to an increased risk for harmful drug use. For the small minority in the Christchurch cohort with severe behaviour problems and poly-drug use at age 15, high rates of maternal smoking and drinking were observed prior to birth.⁴⁸¹

In Minnesota, US, McGue *et al.* found that fathers' and mothers' own reports of earlier age of alcohol use predicted an earlier age of alcohol use for their early adolescent offspring.⁴⁹⁰ Analysis of twin data in this study suggested that family environment influences on early age alcohol use were more important for girls, while genetic factors were more influential for boys.

In the Australian Temperament Project (ATP), mothers' drinking habits when children were aged 13 to 14 years predicted higher poly-drug use by age 15 to 16 years after adjusting for a range of factors including peer relations, child behaviour problems, gender and class.⁴⁶¹

Findings from the New Zealand Christchurch cohort suggest that parent behaviours may influence the development of adolescent high quantity alcohol use independently of the influence of early childhood behaviour problems, parent attitudes to alcohol, gender or social class. However, other factors such as age of first alcohol use and parental approval may be more influential in determining how frequently alcohol is used.

In the Christchurch cohort, parents' alcohol consumption at participant age 11 years was not associated with alcohol problems at age 15 years.¹²⁵ However, parents' alcohol consumption did continue to predict higher amounts of alcohol consumption at age 15 after adjusting for age 8 conduct problems, parental history of alcohol and drug problems (prior to 15 years), male gender, low family SES, family size and parental attitudes to alcohol consumption.⁴⁸⁰ The effect of parents' alcohol consumption at age 11 on frequent alcohol use at age 15 was no longer significant after adjusting for age at first alcohol use, family size, age 14 parental approval of adolescent alcohol use and parental attitudes favourable to alcohol use.¹²⁵

Previous reviews have also noted that the risk of early initiation of use of a drug may be influenced by the number of members of a household, including siblings, who use that drug.¹⁰

6.6 Infancy and pre-school

Through the period from birth until entry to school, evidence suggests that parents remain a central influence on child development. Research suggests that adequate nutrition, security and early learning opportunities are important for healthy child development through this period. A number of studies have demonstrated that experience through this period influences the later emergence of harmful drug use.

6.6.1 Parental neglect and abuse

Summary: Child neglect and abuse is a risk factor for impaired child development and this impairment initiates a pathway of poor child adjustment leading to harmful drug use (one longitudinal study).

Inadequate parental provision of infant care has been shown to influence the subsequent development of drug use in children. For the small minority in the Christchurch cohort who evidenced poly-drug use concurrent with the most severe behaviour problems at age 15 years, early environments from birth were characterised by *in-utero* insult (maternal smoking and drinking), birth complications, problems in infant care (low breast feeding, low infant care, poor parenting), and social instability through childhood (family breakdown and parental changes).⁴⁸¹

A further analysis of the Christchurch cohort noted that sexual abuse in childhood or adolescence predicted higher rates of illicit drug use from 15 to 21 years,⁴⁹² and cannabis and alcohol abuse and dependence at age 16 to 18 years.¹⁵⁶ These effects were robust and persisted after adjusting for other influences such as deviant peer relations, behaviour problems and earlier involvement in drug use.

6.6.2 Temperament and early behaviour

Summary: Easy temperament in early childhood is a protective factor for positive child adjustment and reduces the influence of other risk factors, leading to lower rates of involvement in harmful drug use (one longitudinal study).

Findings from the ATP cohort associated a number of early age temperament indicators with poly-drug use at ages 15 to 16 years.⁴⁶¹ As infants at four to

eight months, these children were reported by their parents to be less regular in their eating and sleeping habits. From ages one to two, the children showed less tendency to persist to complete tasks such as eating or playing, and at age two to three they were perceived as less cooperative and more active or restless. From ages three to four, and in subsequent years, the children tended to be less shy and more outgoing toward strangers. Generally, these effects were small and were no longer significant after controlling for other influences later in life. Hence, once the effects of delinquency and early drug use on poly-drug use were considered, the effect of early temperament disappeared.⁴⁶¹ This demonstrates that temperament was not a direct risk factor but mediated the influence of other adjustment pathways.

Temperament is considered to interact with 'transactional' influences that modify the care the child receives and the impact of that care on later development.⁴⁹³ Children with extremes of temperament may be more difficult to manage and have a higher likelihood of developing adjustment problems.⁴⁹³ Temperament is considered to have a genetic component but appears to be heavily shaped by environmental experiences.

Easy temperament has previously been considered to be a protective factor that underlies the resilience of some children who maintain positive adjustment despite high levels of adversity in childhood.^{10, 494, 495} The findings from the ATP are also congruent with this position in that temperament did not directly predict poly-drug use but it did mediate other risk factors.

6.7 Primary school (ages 5 to 11)

From the years following entry to primary school, parents continue to exert an important influence on child development. However, other factors, including relationships with teachers, adjustment to school and experiences with peers, begin to play an increasingly important role in the child's development.

6.7.1 School

Summary: Early school failure is a risk factor for alcohol abuse (one longitudinal study).

There is some evidence that early failure in primary school may be a risk factor for the later emergence of drug use problems. In a cohort in Finland, low school achievement at age 8 years predicted alcohol abuse at age 26 years, after adjusting for a range of other factors including age 14 aggression, social

anxiety, inattention, pro-sociality, conduct problems, parental drinking and social background.⁴⁸⁹ This finding was independent of gender and social class. A review of research completed in the 1970s and 1980s reached a similar conclusion.¹⁰

6.7.2 Child behaviour

Evidence demonstrates that childhood behaviour problems through the primary school age period are important risk factors for the development of drug use problems. Current evidence suggests that conduct disorder in childhood may be more important than Attention Deficit and Hyperactivity Disorder (ADHD) in predicting later drug use problems.

Attention Deficit Hyperactivity Disorder

Summary: The role of ADHD in predicting youth drug use is unclear.

Analyses in the New Zealand Christchurch cohort and in the ATP cohort suggest that higher symptoms of ADHD in childhood or early adolescence are a predictor for the subsequent emergence of potentially harmful drug use. However, in the Christchurch cohort, these effects appeared to be mediated by conduct problems in childhood. In some US cohorts, ADHD was not found to predict youth drug use.

Analysis of the New Zealand Christchurch cohort demonstrated that those with ADHD at age 8 years tended to use higher amounts of alcohol and experience more alcohol related problems, higher rates of daily tobacco use and more illicit drug use at age 15 years. However, these effects were mediated by conduct disorder such that the effect of ADHD was no longer significant after controlling for age 8 conduct problems.⁴⁸⁰ In their Western North Carolina cohort, Costello *et al.* noted no association between ADHD at age 11 and alcohol abuse at age 16 years.¹¹⁸

In the ATP cohort, youth who reported symptoms of ADHD at ages 13 to 14 years had an increased likelihood of age 15 poly-drug use after adjusting for other factors including externalising behaviour problems, peer relations, SES and gender.⁴⁶¹

Once substance use behaviours are established in adolescence, these behaviours may be very stable and may mask the influence of earlier risk factors. For example, Brook *et al.* found no effect for either ADHD or conduct disorder at age 16 on heavy tobacco use at age 22 years, after adjusting for the influence of prior patterns of drug use.¹³⁸

Conduct disorder

Summary: Conduct disorder in childhood is a risk factor for higher levels of alcohol consumption in adolescence (one longitudinal study). The influence of conduct disorder on alcohol abuse may be mediated by family vulnerability (two longitudinal studies) to alcohol problems or by earlier age alcohol use (one longitudinal study).

In the Christchurch cohort, age 8 conduct problems predicted higher frequency and amount of alcohol consumption at age 14, after controlling for earlier age of alcohol use and changes of parents.⁴⁸⁴ In the same cohort, age 8 conduct disorder predicted the amount of alcohol consumed, alcohol-related problems and illicit drug use at age 15 years. The influence on the amount of alcohol consumption was maintained after adjusting for family SES, male gender, family size and parental attitudes favourable to alcohol use.⁴⁸⁰ However, the effect on alcohol-related problems was no longer significant after controlling for additional factors including age at first alcohol use and parental alcohol/drug problems.¹²⁵ These various findings suggest that the tendency for children with conduct problems to develop alcohol problems may be mediated not by class or gender but by starting alcohol use at an earlier age and through family vulnerability to alcohol problems.

In a separate analysis in the Dunedin cohort (also from New Zealand), conduct problems at age 11 years predicted poly-drug use and the use of cannabis and/or glue for boys (but not girls) at age 15 years.⁴⁹⁶ These effects were very unstable and neither relationship was significant in an adjusted model that included age 11 depressive symptoms.

In a sample of Minnesota twins, McGue *et al.* demonstrated that for adolescent boys (around age 14 years) an earlier age of alcohol initiation was associated with inherited vulnerability to childhood externalising behaviour problems at age 11 years (conduct disorder and oppositional defiant behaviour problems).⁴⁹⁰

Aggression

Summary: Aggression in childhood is a risk factor for early adolescent poly-drug use (two longitudinal studies) and adult alcohol abuse (one longitudinal study).

Childhood aggression appears to be an important risk factor for the later emergence of harmful drug use. In Finland, children rated by peers and teachers to be more aggressive at age 8 years tended to have higher alcohol abuse at age 26 years, after adjusting

for a range of other individual level predictors.⁴⁸⁹ Analysing the ATP cohort, Williams and Sanson *et al.* also noted that children rated by teachers as more aggressive at ages five to six years, or at ages 11 to 12 years, were more likely to progress to poly-drug use by age 15 to 16 years.⁴⁶¹

Brook *et al.*, analysing a cohort from upper New York State, found that the tendency for youth to remain abstinent from alcohol use between ages 16 and 22 years tended to be moderated by a variety of protective factors, including low anger at age 8 years.¹⁶³ In the same cohort, Brook *et al.* found that aggression at age 8 predicted more frequent poly-drug use at age 14, after adjusting for SES.¹³⁵

Depressive symptoms

Summary: The role of childhood depressive symptoms in predicting youth drug use is unclear.

Although it cannot be described as a risk factor, there is some limited evidence that depressive symptoms in primary school age children may predict the emergence of adolescent poly-drug use. In an analysis of the New Zealand Dunedin cohort, depressive symptoms at age 11 predicted poly-drug use and the use of cannabis and/or glue for boys (but not for girls) at age 15 years.⁴⁹⁶ Only the effect predicting poly-drug use remained significant in an adjusted model that included age 11 conduct problems.

6.7.3 Intelligence

Summary: The role of childhood intelligence in predicting youth drug use is unclear.

In previous reviews, child intelligence has been considered as a protective factor predicting positive outcomes for children growing up in difficult circumstances.^{494, 495} Available evidence suggests that intelligence in children, in some contexts, may predict involvement in drug use.¹⁰ Perhaps this is more likely to occur at the beginning of a social trend toward a new form of drug use. However, intelligence is not a consistent predictor of drug use. For example, in the New Zealand Christchurch cohort, intelligence at age 8 was unrelated to the frequency of cannabis use at age 15 to 16 years.¹⁵⁶

6.7.4 Child social and emotional competence

Summary: Social and emotional competence in childhood is a protective factor, reducing the influence of risk factors for alcohol abuse (one longitudinal study) and illicit drug use (one longitudinal study).

Social and emotional competence in primary school-aged children appears to mediate the influence of later risk factors, such as behaviour problems and school adjustment, while not itself directly predicting drug use. Children in Finland rated by peers and teachers to be more pro-social at age 8 were less likely to be involved in alcohol abuse at age 26 years.⁴⁸⁹ However, this effect was no longer significant after adjusting for the influence of age 14 social anxiety, conduct problems and school achievement.

Brook *et al.*, analysing a cohort from upper New York State found that children at age 8 years who were low on emotional control had higher rates of illicit drug use at age 22 years.¹⁶³ This effect was no longer significant after adjusting for measures of personality and drug use through early adolescence (at ages 14 and 16 years).

6.7.5 Temperament and personality

Summary: Shy and cautious temperament in childhood is a protective factor, reducing the influence of risk factors for early adolescent poly-drug use (one longitudinal study) and illicit drug use in early adulthood (one longitudinal study).

In the social context of a high community prevalence of harmful drug use, the primary school-aged child's tendency to interact with strangers and to socialise with other children emerges as an important predictor of potentially harmful drug use. In an analysis of the ATP cohort, children who at age seven to eight years were more inflexible and who were less shy and cautious in approaching strangers had higher rates of poly-drug use by age 15 to 16 years.⁴⁶¹ In the same cohort, children who were more sociable at age nine to 10 years were also more likely to progress to poly-drug use in the mid-adolescent periods. Each of these effects was no longer significant after adjusting for later temperament and behaviour characteristics.

Brook *et al.*, analysing a cohort from upper New York State, found that children who showed fearless personality characteristics at age 8 years were more likely to engage in illicit drug use at age 22 years.¹⁶³ However, these effects were no longer significant after adjusting for measures of personality and drug use at ages 14 and 16 years.

6.8 Secondary school (ages 12 to 17)

During the secondary school age period, the young person develops an increasing independence from the family and this entails identity choices that include attitudes and behaviours relevant to drug use. Relationships with parents, adults in the community, and in the peer group have all been shown to influence the subsequent development of drug use. Behaviour and attitudes through this period are, however, also influenced by the attitudes, behaviours and relationships developed at earlier life-stages.

6.8.1 Community influences

It is possible to overlook the influence of communities on youth drug use by limiting consideration to individual-level longitudinal research. In this section, other sources of data are considered, hence some conclusions are necessarily more speculative.

Community opportunities for access to positive social activities

Summary: Low involvement in activities with adults in adolescence is a risk factor for early adolescent poly-drug use (one longitudinal study).

During the secondary school age period, relationships with adults in the community emerge as more salient predictors of the subsequent development of drug use. In the ATP cohort, children who were less involved in sport and community activities involving adults, at age 13 to 14 years, were more likely to engage in poly-drug use at age 15 to 16 years.⁴⁶¹ These effects were maintained after adjusting for other risk factors such as peer relationships, behaviour problems, gender and SES.

Recent reviews have considered whether youth access to recreation influences youth drug use.⁴¹⁹ It does not appear that access to services influences youth drug use directly. For example, there is little evidence that living in a rural location directly influences youth involvement in drug use. In the VAHC, youth at age 14 years living in rural versus urban locations demonstrated no differences in their tendency to progress to either frequent cannabis use at age 15 years or to daily use at 16 to 17 years.¹²³ Other surveys have also found no difference in the likelihood of alcohol and drug disorders between rural and urban areas.³⁷⁷

Perceived and actual levels of drug use in the community

Summary: The perceived and actual level of community drug use in adolescence is a risk factor for adolescent use of that drug (previous review, one intervention study).

In previous reviews, young people's perception about adult drug use⁴⁹⁷ and the actual community prevalence of drug use have each been found to be important through the adolescent period in predicting the subsequent emergence of youth drug use.¹⁰ Evaluation of drug education programs has demonstrated that programs that reduce youth estimates of adult drug use are more effective at reducing subsequent youth initiation of drug use.⁴⁹⁸

Community disadvantage and disorganisation

Summary: Community disadvantage and disorganisation in adolescence has been associated with adolescent drug use (previous review, associational evidence).

In previous reviews, community disadvantage and disorganisation has been associated with adolescent youth drug use.¹⁰ Vinson has noted the tendency over the last decade for unemployment and family disadvantage to increasingly cluster geographically due to low cost accommodation.⁴⁹⁹ The implication is that certain neighbourhoods have experienced increasing rates of clustering of economically deprived households. Very high rates of youth drug use problems and other related behaviours have been associated with geographic localities characterised by low SES, low income and poor quality housing.^{500–502}

Availability of drugs in the community

Summary: The availability of drugs within the community in adolescence is a risk factor for adolescent use of that drug (previous review, four intervention studies).

The availability of drugs at a community level has been noted to predict the subsequent involvement of youth in drug use.¹⁰ Community intervention research has demonstrated that enforcing laws that prevent minors accessing tobacco reduces youth tobacco use.^{503–505} Introducing laws to prevent sales of alcohol to minors has also been associated with a community mobilisation intervention that demonstrated some reduction in frequent youth alcohol use.⁵⁰⁶

Media portrayal of drug use

Summary: Positive media portrayal of drug use in adolescence is associated with adolescent use of that drug (one intervention study).

Intervention studies have demonstrated that increasing exposure to anti-smoking messages, combined with a school smoking prevention program, was associated with reductions in adolescent smoking.⁵⁰⁷

6.8.2 Family influences

During adolescence, family relationships become more complex. The family appears to maintain an important influence on drug use.

Family attachment

Summary: Attachment to the family in adolescence is a protective factor, reducing risk factors for early adolescent poly-drug use (two longitudinal studies).

Attachment to the family through adolescence tends to be a consistent predictor of youth drug use but its effect is often mediated by other influences, particularly peer relationships. In the upper New York State cohort, Brook *et al.* found that low attachment to parents at ages 14 and 16 years predicted more frequent poly-drug use at age 22 years, after adjusting for other influences.¹³⁶ In the ATP, parent reports of less warmth and communication was an unadjusted predictor of illicit drug use by age 15 to 16 years;⁴⁶¹ after adjusting for the influence of peer relationships, the effect was no longer significant. In the New Zealand Christchurch cohort, Fergusson *et al.* also found that low parental attachment at age 15 was an unadjusted predictor of frequent cannabis use at age 15 to 16.¹⁵⁶

Parental harmony and parent-adolescent conflict

Summary: Low parental conflict (parental harmony) from late childhood and in adolescence is a protective factor, reducing alcohol problems (one longitudinal study).

Summary: Parent-adolescent conflict is a risk factor for early age drug use (one longitudinal study, one intervention).

In the Christchurch cohort, parental conflict prior to age 14 years did not influence the frequency of alcohol use at age 15, but did relate to increased problems with alcohol at that age. The effect on alcohol-related problems was not a direct risk factor but appeared to mediate other influences such as the

child's age of first drug use. The effect was no longer significant after adjusting for the child's age at first alcohol use, male gender, low family SES, parental alcohol/drug problems and favourable parental attitudes to alcohol use.¹²⁵ In the same cohort, parent conflict in childhood was an unadjusted predictor of frequent cannabis use at age 15 to 16 years.¹⁵⁶ From these findings, it can be inferred that parental conflict was not a direct predictor of adolescent alcohol use but may have influenced other family factors. We infer from this finding that parental harmony in adolescence may work as a protective factor, mediating the influence of other risk factors such as early age alcohol use.

Through the secondary school period, increasing levels of parent-adolescent conflict can emerge. In a small US cohort, Brody and Forehand demonstrated that mother-adolescent conflict predicted early initiation of adolescent alcohol use.⁵⁰⁸ This finding was adjusted for other influences including family breakdown and parental conflict. An Australian study demonstrated that reductions in early-adolescent poly-drug use were achieved through a parent education intervention that reduced levels of parent-adolescent conflict.⁴⁸⁵

Parental attitudes to drug use

Summary: Favourable parental attitudes to drug use from late childhood is a risk factor for early age initiation of the same drug (one longitudinal study).

Analyses of the Christchurch cohort revealed that favourable parental attitudes to alcohol consumption at age 11 years continued to predict both the amount of alcohol consumed and the problems experienced with alcohol at age 15 after adjusting for a range of other risk factors.⁴⁸⁰ In the same cohort, parental attitudes toward alcohol use at age 14 also predicted more frequent alcohol use and alcohol problems at age 15 after adjustment for other risk factors.¹²⁵ Parental approval of adolescent alcohol use at age 14 was not associated with alcohol problems at age 15, but did predict frequent alcohol use at age 15.¹²⁵

Alcohol and drug problems in the family

Summary: Parental alcohol and drug problems early in their offspring's adolescence is a risk factor for earlier age alcohol use and higher levels of alcohol use later in adolescence (two longitudinal studies).

There is some evidence to suggest that parental problems with alcohol use may be a risk factor for youth alcohol use problems. In the New Zealand Christchurch cohort, this effect was maintained after

adjusting for other influences such as parent attitudes and child behaviour problems. Earlier work summarised in the current document suggests this effect may be partly based on genetic predisposition in males.

In a cohort in Western North Carolina in the US, family history of alcohol problems was found to predict an earlier age of initiation to alcohol use for males but not for females. However, this analysis did not adjust for other known influences.¹¹⁸

In an analysis of the New Zealand Christchurch cohort, parental alcohol and drug problems at age 14 years did not predict the frequency of alcohol use at age 15, but did predict alcohol-related problems at this age.¹²⁵ This relationship was maintained after adjusting for age at first alcohol use, family size (at birth), parental approval of adolescent alcohol use (age 14 years) and parental attitudes favourable to alcohol use (age 14). In the same cohort, parental history of alcohol and drug problems prior to age 15 predicted the amount of alcohol consumption at age 15. This effect applied after adjusting for age 8 conduct problems, parental alcohol consumption, male gender, low family SES, family size and favourable parental attitudes to alcohol consumption.⁴⁸⁰ As analyses were not separated by gender it is unknown whether similar predictors applied for both males and females in this cohort.

In previous reviews, parental criminality or antisocial behaviour has also been linked to the subsequent emergence of drug use problems in offspring.⁵⁰⁹

Parental communication and monitoring

Summary: Parental communication in early adolescence is a protective factor, reducing the influence of risk factors for harmful youth drug use (three intervention studies).

Parental supervision of children (being aware and in charge of what children are doing) is one of the most important predictors of the subsequent involvement of children in delinquent behaviour. This has been demonstrated, for example, in follow-up studies where home visitor impressions were used to measure supervision.⁵¹⁰ In adolescence, the term monitoring is used to describe the change in parenting toward communication and negotiation strategies to remain aware of, and have some influence over, what the adolescent does.

Evidence from three intervention studies suggests that parental communication practices may have protective effects in reducing subsequent risks for adolescent involvement in harmful drug use. Perry and colleagues⁵⁰⁶ found that an intervention designed to improve parent communication regarding alcohol resulted in increased communication, based on child reports. The intervention was subsequently successful in reducing early age alcohol use.

In work by Spoth and colleagues, a parenting training program designed to assist parents to improve their parenting skills was associated with increased adolescent ratings of positive family attachment. The intervention was successful at reducing early adolescent alcohol use.⁵¹¹

In an Australian parent education intervention, parents were exposed to a curriculum designed to enhance skills for communicating with adolescents and resolving conflict. In families exposed to the intervention adolescents' and parents' ratings showed lower parent-adolescent conflict and adolescents rated parents to be higher in care. These adolescents showed a reduction in poly-drug use.⁴⁸⁵

Research demonstrating that poor parental communication directly predicts youth drug use could not be found. However, in many studies, effective family communication has been modelled as a protective factor reducing youth drug use.^{512, 513}

Family rules and discipline

Summary: Parental rules permitting drug use in childhood or early adolescence is a risk factor for early age drug use (one longitudinal study).

In an analysis with the New Zealand Christchurch cohort, parental approval of adolescent alcohol use at age 14 years predicted a higher frequency of alcohol use at age 15.¹²⁵ This relationship was maintained after adjusting for age at first alcohol use, parental alcohol and drug problems at age 14, family size (at birth) and parental attitudes favourable to alcohol use (age 14 years).

Work examining parenting has suggested that two important dimensions influencing child outcomes are: nurturance/warmth and demands for responsible behaviour. Families high in nurturance and demands are defined as authoritative and these qualities tend to predict better developmental outcomes for children. Rules for responsible behaviour are typically included in measures of family demands.

In a sample of US students interviewed in the early 1970s, maternal use of a permissive parenting style (high nurturance but low demands) was an unadjusted predictor of more frequent involvement in illicit drug use at ages 24 to 25 years, for males.¹¹⁴⁹ In the same cohort, mothers' use of an authoritarian parenting style (low nurturance but high demands) predicted more frequent involvement in illicit drug use at ages 24 to 25 years, for females. This effect was maintained after adjusting for other influences including adolescent drug use.

6.8.3 School

Completing secondary school

Summary: Not completing secondary school is a risk factor for early adult drug problems. However, it is unclear whether this relationship is explained by earlier developmental influences.

Young people who leave school in the early secondary school years tend to have a greater likelihood of engaging in drug use. Retention in school is itself predicted by earlier childhood development, including school adjustment and behaviour problems. Academic achievement and feelings toward school are closely related factors that have been found to predict involvement in illicit drug use but may be unrelated to alcohol use.

Several studies have associated lower levels of education with higher levels of harmful drug use. For example, lower levels of education have been associated with more frequent cannabis use (within cannabis users).¹⁶⁶ Persons of lower educational attainment are more likely to develop drug use problems.⁵¹⁴

It is unclear whether the relationship between school failure and harmful drug use relates to earlier developmental influences. School failure has been associated with an earlier age of onset of drug use.⁵¹⁶ In unadjusted analyses in the ATP cohort, youth who reported low school bonding or fewer opportunities for involvement at school, at age 13 to 14 years, had an increased likelihood of illicit drug use at ages 15 to 16.⁴⁶¹

6.8.4 Peer relationships

Summary: Relationships with peers who are involved in drug use in late childhood or adolescence is a risk factor for alcohol abuse and illicit drug use (three longitudinal studies).

Association with peers who engage in drug use appears to be an important risk factor through the

early secondary school period, influencing subsequent involvement in harmful drug use. In the Christchurch New Zealand cohort, peer drug use at age 15 years predicted alcohol abuse at age 16. This effect was maintained after adjusting for male gender and age 14 alcohol use.⁴⁸⁴

In analysis of the VAHC, both perceived peer cannabis use and classroom prevalence of cannabis use at age 14 years predicted more frequent cannabis use by age 15 and, for males, daily cannabis use at age 16 to 17 years. These effects were significant after adjusting for a range of factors related to earlier drug use, antisocial behaviour and parental divorce and separation.¹²³

In an analysis of the ATP, children who were more popular with peers at 11 to 12 years, or more involved with peers at ages 13 to 14 years, had higher rates of poly-drug use by age 15 to 16 years. These effects were maintained after adjusting for other factors. In the same cohort, mixing with deviant peers in early adolescence was also associated with illicit drug use in mid-adolescence.⁴⁶¹

Externalising behaviour problems—delinquency and conduct problems

Summary: Delinquency in adolescence is a risk factor for alcohol abuse and illicit drug use (six longitudinal studies).

The influence of child behaviour problems, such as ADHD and conduct disorder, on youth drug use was described above. Problems involving delinquent or criminal behaviour and/or conduct and oppositional defiant behaviours are sometimes grouped together and discussed as externalising behaviour problems.

Longitudinal studies suggest that externalising behaviours in adolescence have a high level of stability from childhood. However, externalising behaviour problems do emerge in some adolescents with no prior childhood history. A number of studies suggest that externalising behaviour problems in early adolescence represent important risk factors for the development of drug problems.

In Finland, age 14 conduct problems in boys predicted alcohol abuse at age 26 years, after adjustment for a range of other risk factors including age 14 aggression, social anxiety, inattention, pro-sociality, low school achievement, parental drinking and social background.⁴⁸⁹ In a cohort in the US that included children with alcoholic parents, externalising symptoms at age 13 years predicted alcohol abuse at age 20.¹⁴⁷

Steele *et al.*, examining a cohort in the south east of the US, noted that externalising behaviours in early-adolescence (age 13 to 14 years) predicted more frequent alcohol use at age 20 for males and females, and for males, more frequent cannabis and illicit drug use at age 20 years.⁵¹⁷ In the New Zealand Dunedin cohort, McGee *et al.* found that externalising behaviour problems at age 15 predicted higher levels of cannabis use at age 18 years.¹²² In the ATP cohort, youth who reported more involvement in delinquency at ages 13 to 14 had a greatly increased likelihood of age 15 to 16 poly-drug use after adjusting for other factors. In the same cohort, delinquency and conduct problems at age 13 to 14 also predicted illicit drug use at age 15 to 16 years.⁴⁶¹ Brook *et al.*, analysing a cohort from upper New York State, found that the tendency for youth to remain abstinent from alcohol use between age 16 and 22 years tended to be moderated by protective factors that included low delinquency at ages 14 to 16.¹⁶³

Once drug use is established in adolescence it has considerable stability. Brook *et al.*, analysing the same cohort from upper New York State, found that conduct disorder at age 16 did not predict either heavy tobacco, alcohol, cannabis or illicit drug use at age 22 after adjusting for prior drug use.¹³⁸

Internalising behaviour problems—anxiety and depression

Summary: The influence of anxiety and depression in adolescence on subsequent harmful drug use is unclear.

In a cohort in the US that included children with alcoholic parents, internalising symptoms at age 13 years were not related to alcohol abuse at age 20.¹⁴⁷ There is some evidence that anxiety in early adolescence may predict subsequent drug use in females; however, anxiety in boys may result in less drug use. In Finland, for age 14 adolescents the effect of social anxiety on alcohol abuse at age 26 tended to increase involvement for girls but reduced the risk for boys.⁴⁸⁹ In a separate cohort in the south east of the US, internalising behaviours in early adolescence (age 13 to 14 years) also predicted a lower frequency of cannabis and illicit drug use, for males.⁵¹⁷ However, in this cohort, internalising behaviours in early-adolescence were unrelated to more frequent alcohol use at age 20 years. In the New Zealand Christchurch cohort, anxiety disorder at age 14 to 16 was an unadjusted predictor of frequent cannabis use at age 15 to 16 years.¹⁵⁶

Depression in early adolescence has been an unstable predictor of drug use. In a sample of US

students interviewed in the early 1970s, males who were lower on measures of depression at age 16 years were more likely to engage in frequent illicit drug use at ages 24 to 25.¹⁶² This effect was maintained after adjustment for other factors including adolescent drug use.

In the ATP, children who had more depressive symptoms at 11 to 12 years were more likely to progress to poly-drug use at age 15 to 16 after adjusting for other risk factors. In the same cohort, depressive symptoms at age 13 showed an unadjusted association with more illicit drug use at age 15.⁴⁶¹

In the VAHC, symptoms for depression and anxiety at age 14 years tended to predict a higher frequency of cannabis use at age 15, and more involvement in daily cannabis use at age 16 to 17. However, these effects were no longer significant after adjusting for other factors such as peer cannabis use, daily cigarette smoking, high dose alcohol use, frequent alcohol use, antisocial behaviour, and divorced or separated parents.¹²³ Simons *et al.* have argued that adolescent depression may exacerbate vulnerability to peer influence and this may have been one of the reasons that depressive symptoms were no longer significant in the VAHC once the influence of peer cannabis use was considered.⁵¹⁸

Brook *et al.* found that neither anxiety nor depression at age 16 years predicted heavy alcohol use, or heavy cannabis use at age 22, after adjusting for prior drug use. In the same study, depression at age 16 was also unrelated to heavy illicit drug use at age 22.¹³⁸

It is possible that depression predicts some forms of alcohol dependence but not others. In a cohort in the Midwest of the US, depressive symptoms at age 18 years were found to predict the less common forms of chronic alcohol dependence and alcohol dependence that was co-morbid with tobacco dependence, through ages 18 to 25 years. However, depressive symptoms did not predict adolescent limited forms of alcohol dependence.¹²⁰

6.8.5 Sensation seeking and adventurous personality traits

Summary: Sensation seeking and adventurous personality in adolescence are risk factors for poly-drug use (three longitudinal studies, previous review).

Adventurousness and a lack of fear in early adolescence appear to be risk factors for subsequent involvement in drug use. In the New Zealand

Christchurch cohort, it was found that the tendency to novelty seeking at age 16 years predicted higher rates of cannabis and alcohol abuse and dependence, and also illicit drug use, at age 16 to 18. These effects were maintained after adjusting for other influences such as earlier drug use, deviant peer relationships and disadvantaged family background.¹⁵⁶ In a previous review of research completed prior to the 1990s, sensation seeking was identified as a risk factor for youth drug abuse.¹⁰ Brook *et al.* found that the tendency for youth illicit drug use to remain stable between age 16 and 22 was reduced (moderated) by protective factors that included fearfulness at age 16.¹⁶³

In the ATP, children who were reported by their parents to be less anxious and fearful at 11 to 12 years, or less shy and withdrawn at age 13 to 14, had higher rates of poly-drug use by age 15 to 16. These effects were maintained after adjusting for a range of other predictors including peer relations, behaviour problems, SES and gender.⁴⁶¹ Negative moods and emotions in early adolescence have also been shown to predict subsequent involvement in poly-drug use in the ATP.⁴⁶¹

6.8.6 Attitudes to drug use

Summary: Favourable attitude to drug use in adolescence is a risk factor for use of that drug (two longitudinal studies).

Attitudes towards drug use behaviour in early adolescence are associated with an increased involvement in subsequent drug use. In the upper New York State cohort, Brook *et al.* found that the tendency for youth illicit drug use to remain stable between age 16 and 22 years was reduced (moderated) by protective factors that included intolerance of unconventional behaviour at age 14.¹⁶³ In the same cohort, tolerance of unconventional behaviour at age 14 predicted more frequent poly-drug use at age 22, after adjusting for other factors.¹³⁶ In the Christchurch cohort, favourable attitudes to drug use at age 14 predicted higher rates of illicit drug use from 15 to 21 after adjusting for a range of factors, including early age drug use, childhood sexual abuse and delinquent behaviour.⁴⁹²

The family appears to be an important context for the development of attitudes and behaviours through adolescence. Kandel and Andrews noted parents' values to be of particular influence in shaping fundamental adolescent beliefs relevant to education, work and social relationships.⁵¹⁹ Attitudes to health behaviours may be particularly malleable in late childhood and early adolescence,

when decisions relevant to involvement in behaviours such as drug use are being made.⁵²⁰ Catalano and Hawkins summarised evidence suggesting that adolescent identification and modelling of parent attitudes and behaviours are typically mediated by family attachment⁴⁷⁹ although not all studies concur.⁵¹⁹

6.8.7 Religion

Summary: Religious involvement in adolescence is a protective factor, reducing the influence of risk factors for harmful drug use (previous reviews).

Religiosity appears to be protective against developing drug and alcohol problems.^{10, 521} The Christchurch cohort found those with severe behaviour problems at age 15 years were characterised by disadvantaged early family backgrounds and parental characteristics that included low church attendance.⁴⁸¹

6.9 Adulthood (ages 18 to 64)

In the years following the completion of secondary school substance use tends to escalate. As was noted earlier, young adults have higher rates of drug and alcohol use relative to other sections of the population. Longitudinal studies suggest that for many individuals early adulthood will be a period where potentially harmful involvement in alcohol and other drug use will peak. Involvement in drug use through this period is strongly predicted by behaviours developed in the secondary school age period. However, there are some factors that have been observed to influence young adult drug use, including peer and spouse relationships and patterns of behaviour in educational, employment and social settings.

For those populations that are involved in drug use, there are more particular public health risks that are posed through early adulthood. These include risks of disease transmission through needle sharing and risks associated with crime and violence. Knowledge of special populations, such as injecting drug users and Indigenous populations, is not available through longitudinal research, hence the available sources of information should not be ignored.

There has been less research examining factors that influence stability and change in patterns of drug use through adulthood. It is known that during adulthood many individuals decrease their involvement in harmful drug use. Factors associated with increasing family responsibilities, experience

with the consequences of earlier drug use and decreasing vitality are all thought to be implicated but there has been little research.

6.9.1 Drug use behaviour

Summary: Frequent drug use in late adolescence is a risk factor for drug-related harm in adulthood (Chapter 3).

Available evidence summarised in earlier sections of this report demonstrates that drug use behaviour in adulthood is strongly predicted by drug use behaviours developed in adolescence. In the period from around age 18 years, heroin use may start to emerge in some populations (although the age of initiation has lowered through the 1990s); a lengthy history of drug use with alcohol intoxication at age 12 to 13 are typical in heroin users.¹⁶⁶

Risk periods for initiation of cannabis (marijuana) use are mainly over by age 20 years and initiation after age 29 is very rare. For adults in their late 20s, 'higher proportions of users stop using marijuana than start using it'.⁵²² Late onset of smoking is quite rare. Smoking is a behaviour typically initiated in adolescence.⁵²³

6.9.2 Community

Summary: A well-managed environment for alcohol use in adulthood is a protective factor, reducing the risk of harms associated with alcohol use (descriptive associational studies, Chapter 14).

Evidence from a number of studies suggests that well-managed environments for the sale and consumption of alcohol provide an important community contribution to reducing harms associated with alcohol use.

Drinking settings appear to influence violence.³⁸⁵ Alcohol-related violence is highly associated with a small number of venue types, with the majority of venues in most studies reporting zero incidences of violence. A number of factors in drinking settings have been shown to increase the likelihood of violence. For example, either overly relaxed or overly aggressive staff conduct is associated with an increased risk of violence.³⁸⁵ Large numbers of patrons binge drinking at the same time increases the likelihood of problems as do frustrating or irritating patrons, poor ventilation, smoky air, inadequate seating and/or inconvenient bar access. More 'permissive' environments (e.g. allowing aggressive behaviour, swearing, rowdiness, etc) are associated with higher likelihood of violence.⁵²⁴

Crowding and congestion in licensed venues is also associated with increased aggression,³⁸⁵ as is pool playing, patrons milling about and patrons being bored.³⁸⁵ One of the strongest predictors of risk for individual drinking venues is the presence of bar staff who continue to serve obviously intoxicated patrons.⁵²⁵ Another significant risk factor is closing time of hotels and pubs. This is believed to be associated with a gathering in the street of a large number of intoxicated people from a variety of different venues.⁵²⁵

Clean, well-presented drinking environments are associated with fewer problems.⁵²⁴ Positive social atmospheres where boredom is low, and where venues serve full meals are associated with a lower risk of aggression.⁵²⁴

Alcohol-related crime is also more likely in areas of a community with a high concentration of licensed premises in the one area, and with the often corresponding effect of large numbers of drinkers leaving the venues at around the same time.³⁸⁵ Licensed premises are an especially high-risk scenario for drink driving.³⁸⁵

6.9.3 Marriage and partners

Summary: Marriage in early adulthood is a protective factor, reducing the risk of harms associated with alcohol use (two longitudinal studies).

In general, in US studies conducted in the 1980s, living with a spouse in the years following secondary school appeared to reduce subsequent involvement in illicit drug use. In a sample of US students interviewed in the early 1970s, males and females who were married by age 24 years were less likely to be involved in frequent illicit drug use at ages 24 to 25.¹⁶² This finding was maintained after adjustment for a range of other influences including adolescent drug use. In a separate follow-up of a national US sample of students, initiated in 1975, involvement in illicit drug use in the years following secondary school was also lower for students living with a spouse.¹⁶⁴

Australian national mental health survey data reveal at a very broad level that substance use disorders are associated with marital status and living arrangements. Substance use disorders were present in 13.1% of people who had never been married, in contrast to 4.5% of married people.³⁷⁷ Married people had lesser rates of disorder than those separated or divorced, who in turn had lesser rates than never married people.³⁷⁷

6.9.4 Employment

Summary: Unemployment in early adulthood is associated with harmful alcohol use but it is unclear whether its influence is maintained after adjusting for earlier risk factors.

Unemployed people are significantly more likely to have used hallucinogens, and to have used them in the last 12 months, than people in the workforce.¹⁶⁶ The prevalence of injecting drug use, cocaine use and use of LSD is also highest for those who are unemployed.¹⁶⁶

In a sample of US students interviewed in the early 1970s, males who were unemployed prior to age 24 years were more likely to be involved in frequent illicit drug use at ages 24 to 25.¹⁶² This finding was no longer significant after adjusting for other influences including adolescent drug use.

6.9.5 Mental health

Summary: Having a mental health problem in adulthood is associated with harmful drug use. It is unclear whether mental health problems determine drug use.

As was discussed in the earlier sections of this report dealing with drug-related harms, drug use in adolescence appears to predict a variety of mental health problems. Evidence presented in earlier sections of the present chapter suggested that some mental health disorders in childhood and adolescence predict subsequent drug use. It is less clear whether mental health problems in young adulthood continue to predict drug use, after controlling for earlier drug use and mental health symptoms.

In a cohort in Erie County in New York, aged 19 and older, depression was found to have a differential effect by sex in predicting alcohol abuse and dependence two years later. For males there was no effect, while for females the effect was significant after adjusting for prior alcohol problems, race and social class.⁴⁹¹

In a cohort in the Midwest of the US, depressive symptoms at age 18 were found to predict, between ages 18 to 25, both the less common forms of chronic alcohol dependence and alcohol dependence that was co-morbid with tobacco dependence. However, depressive symptoms did not predict adolescent-limited forms of alcohol dependence.¹²⁰

6.10 Retirement and old age (ages 65+)

During the period of retirement and old age, late-onset drinking problems emerge in some populations. In a recent review, it was argued that in many cases drinking problems emerging in the elderly are a continuation of high levels of non-problematic social drinking earlier in life.²⁵⁶ Previous drinking levels may become associated with problems due to the impact of cognitive or functional impairments emerging due to alcohol and/or aging, or through greater vulnerability to the effects of alcohol with age.

6.10.1 Social isolation and loss of partners

Based on clinical impressions, losing a spouse, loneliness and reduced social support have been associated with late-onset drinking problems in the elderly.^{256, 260}

6.10.2 Retirement

Other psychological stresses associated with aging that have been anecdotally linked with late-onset drinking problems in the elderly include a loss of economic status, unrealistic expectations of retirement and a sense of loss of role.²⁵⁸

6.10.3 Negative life events

In their 1989 review, Schonfeld and Dupree reported that loneliness and boredom were the most frequently self-reported experiences of late onset alcohol abusers.²⁵⁸

6.10.4 Health

Increasing age is a significant risk factor for an adverse reaction to medicinal drugs.²⁶⁸

6.11 The cumulative influence of elevated risk factors and depressed protective factors

In recent years, the risk focused approach to the prevention of adolescent health problems has emerged from the public health arena. This grew from recognition that a range of adolescent health and social problems clustered in particular individuals and particular social settings. Thus, a young tobacco user is more likely to be a heavy drinker, use cannabis, engage in risky sexual activity, have higher rates of antisocial behaviour and, if female, experience symptoms of depression. So too, different social settings (e.g. schools and

local neighbourhoods) tend to vary markedly in the rates of a range of problems, including tobacco use.

One important reason for this clustering appears to be a range of social and individual risk factors that predispose to adolescent health and social problems. Previous reviews¹⁰ have suggested that an individual's sense of positive connection or attachment to family, school and community protects against a range of risk behaviours, as well as promoting positive educational and social outcomes. Similarly, the existence of a clear set of values, for example a belief in social order, appears protective against a range of risky behaviours, including tobacco use.

Earlier work completed in Victoria⁵²⁶ has, for example, shown that such a framework can be successfully applied in the Australian context to assess risk and protective factors among adolescents. The relationship between tobacco and alcohol use during the last 30 days and the presence of each of the risk and protective factors was determined from survey data of approximately 9000 Victorian secondary school students and is presented in Table 6.1 to illustrate the range of factors linked to both tobacco and alcohol use. The risk and protective factors listed in this table were included in the Victorian survey following US literature reviews implicating these factors as predictors of youth substance abuse.^{10, 479} Many adolescent health problems share important risk factors. For example, academic failure and school dropout are associated with antisocial behaviour, higher rates of substance abuse, tobacco use and emotional problems. Similarly, factors such as family attachment and family conflict are linked to a broad range of adolescent health problems beyond tobacco use. This observation from both cross-sectional and longitudinal studies lies behind a growing push to target risk and protective factors, with multiple outcomes, rather than restrict focus solely to those that are 'issue specific'.

The interested reader is referred to further reviews on the determinants of drug abuse in adolescence,¹⁰ and integrative theories of resilience such as the Social Development Model.⁴⁷⁹

Table 6.1 makes clear that risk and protective factors identified in overseas research predict alcohol and tobacco use in similar ways within Australian youth populations. The present overview makes clear that there are various risk and protective factors influencing entry to drug use and progression to harmful drug use. The conclusions reached in the current review are similar to those reached from earlier review work examining evidence accumulated to the early 1990s.^{10, 124, 494, 527, 528}

Table 6.1 The prevalence and relative risks associated with individual risk and protective factors and the use of tobacco and alcohol in the last 30 days

	Smoking in the last 30 days			Alcohol in the last 30 days		
	Prev (%)	RR	95%CI	Prev (%)	RR	95%CI
Family risk factors						
Parental attitudes favourable to drug use	48	2.92	(2.72 - 3.14)	78	2.15	(2.06 - 2.23)
Poor family management	37	2.07	(1.93 - 2.24)	64	1.64	(1.57 - 1.72)
Poor discipline	50	2.72	(2.54 - 2.93)	75	1.84	(1.76 - 1.91)
Family conflict	37	1.85	(1.71 - 1.99)	60	1.42	(1.35 - 1.48)
Family history of antisocial behaviour	52	3.35	(3.12 - 3.60)	74	1.92	(1.84 - 2.00)
Parental attitudes favourable to antisocial behaviour	38	1.91	(1.77 - 2.06)	63	1.51	(1.44 - 1.58)
Family protective factors						
Attachment	13	0.49	(0.44 - 0.56)	32	0.65	(0.61 - 0.70)
Opportunities for pro-social involvement	13	0.48	(0.43 - 0.54)	34	0.67	(0.63 - 0.72)
Rewards for pro-social involvement	12	0.46	(0.41 - 0.52)	33	0.65	(0.61 - 0.70)
School risk factors						
Academic failure	36	1.99	(1.85 - 2.14)	57	1.36	(1.30 - 1.42)
Low commitment to school	39	2.43	(2.25 - 2.62)	61	1.59	(1.52 - 1.66)
School protective factors						
Opportunities for pro-social involvement	14	0.53	(0.47 - 0.58)	36	0.70	(0.66 - 0.74)
Rewards for pro-social involvement	15	0.55	(0.49 - 0.61)	34	0.67	(0.63 - 0.72)
Individual/peer risk factors						
Early initiation of problem behaviour	54	5.46	(5.01 - 5.94)	78	2.42	(2.32 - 2.53)
Favourable attitudes to drug use	52	4.27	(3.96 - 4.62)	77	2.25	(2.15 - 2.34)
Perceived risks of drug use	41	2.40	(2.22 - 2.58)	63	1.57	(1.50 - 1.64)
Friends' use of drugs	58	6.32	(5.79 - 6.90)	81	2.49	(2.39 - 2.60)
Sensation seeking	46	3.17	(2.94 - 3.42)	72	2.03	(1.94 - 2.12)
Rewards for antisocial behaviour	29	1.38	(1.28 - 1.49)	54	1.27	(1.22 - 1.33)
Gang involvement	44	2.18	(2.02 - 2.35)	62	1.39	(1.32 - 1.46)
Rebelliousness	38	2.16	(2.00 - 2.33)	63	1.59	(1.52 - 1.66)
Antisocial behaviour	47	3.12	(2.90 - 3.36)	69	1.82	(1.75 - 1.90)
Interaction with antisocial peers	49	3.35	(3.11 - 3.60)	70	1.82	(1.74 - 1.89)
Favourable attitudes to antisocial behaviour	39	2.43	(2.25 - 2.62)	63	1.66	(1.59 - 1.73)
Individual/peer protective factors						
Religiosity	17	0.65	(0.58 - 0.72)	37	0.75	(0.70 - 0.80)
Social skills	3	0.09	(0.07 - 0.12)	13	0.24	(0.21 - 0.26)
Belief in natural order	13	0.42	(0.38 - 0.47)	31	0.59	(0.56 - 0.63)
Community risk factors						
Laws and norms favourable to drug use	48	4.18	(3.85 - 4.53)	76	2.32	(2.22 - 2.42)
Perceived availability of drugs	52	4.12	(3.82 - 4.45)	76	2.14	(2.05 - 2.23)
Low neighbourhood attachment	31	1.45	(1.34 - 1.57)	53	1.20	(1.14 - 1.26)
Community disorganisation	33	1.72	(1.60 - 1.86)	57	1.37	(1.31 - 1.43)
Personal transitions and mobility	26	1.18	(1.09 - 1.29)	46	0.98	(0.93 - 1.03)
Community transitions and mobility	25	1.04	(0.96 - 1.13)	48	1.03	(0.98 - 1.08)
Community protective factors						
Opportunities for pro-social involvement	24	0.95	(0.88 - 1.03)	48	1.03	(0.98 - 1.08)
Rewards for pro-social involvement	17	0.68	(0.61 - 0.76)	40	0.84	(0.79 - 0.89)

Prevalence of the outcome behaviour (smoking or alcohol use) amongst those high on the listed risk or protective factor.

6.12 Where should we target prevention efforts? Risk, protection and the prevention paradox

The 'Prevention Paradox' was a term coined by the epidemiologist Geoffrey Rose to describe how often it is the lower risk individuals who collectively contribute the bulk of preventable illness in the community due to their greater numbers.⁵²⁹ The classic example is that the numerous individuals with moderately elevated blood pressure collectively experience more heart attacks than do the smaller number of people with highly elevated blood pressure. Kreitman¹¹ first drew attention to what appears to be a similar phenomenon in relation to alcohol. People who on average consume moderate amounts collectively experience more harmful consequences from drinking than do those classified as heavy drinkers. It was subsequently demonstrated that this 'paradox' vanishes when a measure of 'binge drinking' is used instead of average daily consumption.^{530, 531} Most of the harmful outcomes measured by Kreitman were those that would be expected to be related to binge drinking, for example, taking time off work, being injured, being in a fight.

In the summary above, the key concept of risk has been applied more broadly to a range of social, familial, contextual and developmental variables found to be predictive of adolescent drug use. Does the prevention paradox apply to these data? In other words, are the high risk individuals responsible collectively for most of the risky drug use or is it the bulk of the population who are at low or average risk who collectively generate the bulk of risky behaviour? This is a central question for policy in the area of drug prevention as it speaks to whether strategies should be targeted mainly at high-risk individuals or the population as a whole.

To address this question, a data re-analysis was conducted (specially for this project) of a major Victorian survey of around 9000 secondary school children, across school years seven, nine and 11.⁵²⁶ Risk and protection factors were measured using a specially adapted version of the scale developed in the US to measure risk and protective factors, identified in the review by Hawkins and colleagues.¹⁰ This scale allows a single summary measure to be derived indicating degree of risk and absence of protective factors. Scores on this scale were categorised into three groups: Low risk, Average risk and High risk. These categories were defined on the basis of the obtained frequency distribution of scores. Thus, Low risk was defined as one standard deviation or more below the mean

score and High risk as one standard deviation or more above the mean.

Potentially harmful drug use was defined for the analysis as follows:

- drinking five or more drinks on one day, at least weekly;
- smoking cigarettes at least weekly;
- smoking cannabis at least weekly; and
- using any other illicit drug at least weekly.

Figures 6.1 to 6.4 report the percentages of students falling into each risk group for each drug type examined.

The extent to which the prevention paradox applied to adolescent risk and protection factors varied as a function of age and drug type. In relation to the legal drugs alcohol and tobacco, the paradox holds for the older children. That is, for year 11 children (and year 9 for smoking) the majority of those who drink more than four drinks at least weekly (who smoke a cigarette at least weekly) are Average or Low risk on the modified Catalano *et al.* scale (Figures 6.1 and 6.2).

For at least weekly use of cannabis and of other illicit drugs, it is the High risk students who comprise the majority, at all school years (Figures 6.3 and 6.4).

Across all drug types, the younger the student the more likely it is that potentially harmful drug use is associated with higher risk individuals (though numbers are fortunately very small for illicit drug use in school year 7). It is recommended that this issue be explored further in older age groups. The trend for cannabis, for example, indicates that the prevention paradox might apply to weekly use by the late teenage years.

In summary, while adolescents with a high number of developmental risk factors and low protective factors are more likely to use all types of drugs in a potentially harmful manner, it is the bulk of children at low or average developmental risk who engage in smoking and drinking regularly by year 11. That is, the prevention paradox holds for the legal drugs. This is not the case for the illicit drugs though future analyses are likely to find that by late teens the prevention paradox also applies to weekly cannabis use. These findings suggest that prevention strategies for legal drugs need to be universal in their application and relevance to young people. An investment in targeted programs for high risk adolescents is also warranted, especially with a view to the prevention of later use of illicit drugs.

Figure 6.1 Proportion of weekly smokers in years 7, 9 and 11 by levels of risk

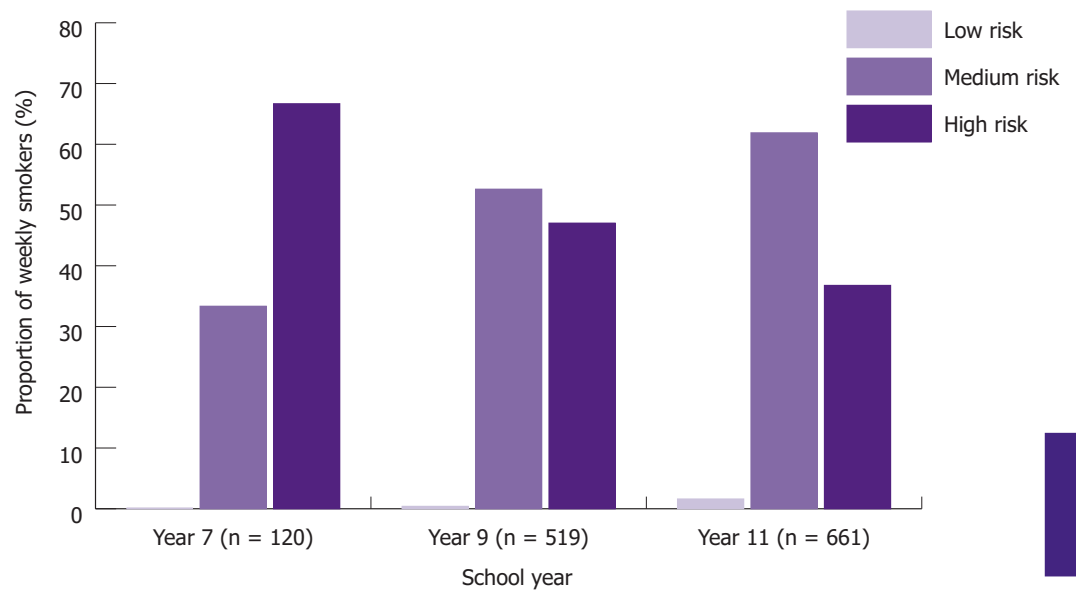


Figure 6.2 Proportion of binge drinkers in years 7, 9 and 11 by levels of risk

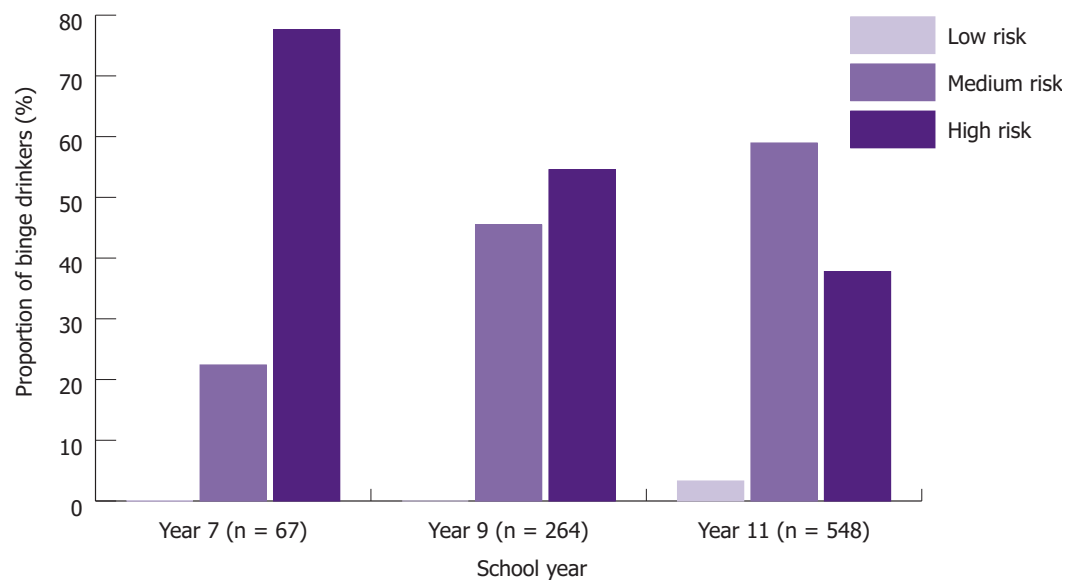


Figure 6.3 Proportion of weekly cannabis users in years 7, 9 and 11 by levels of risk

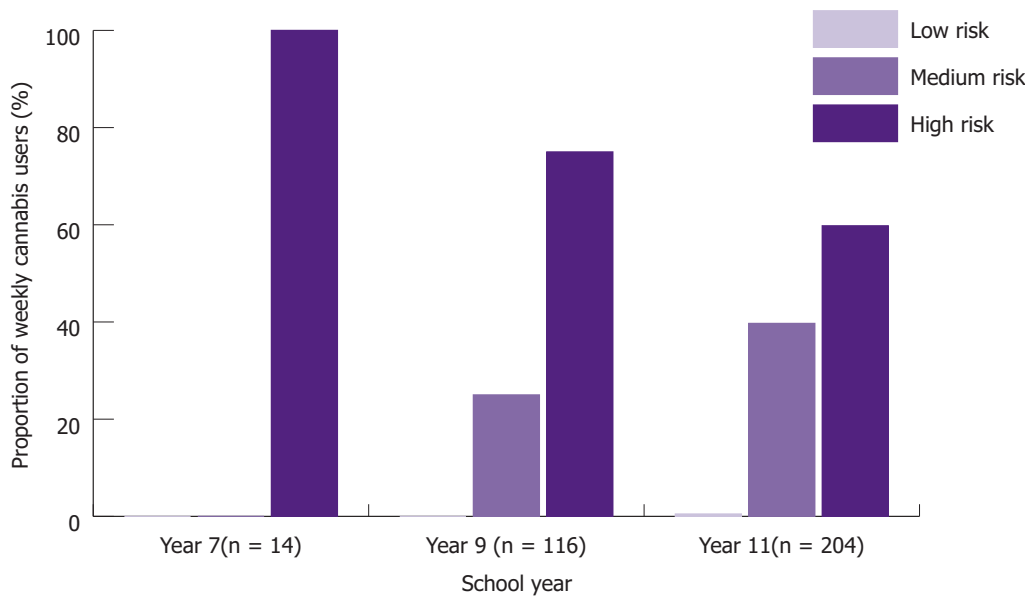
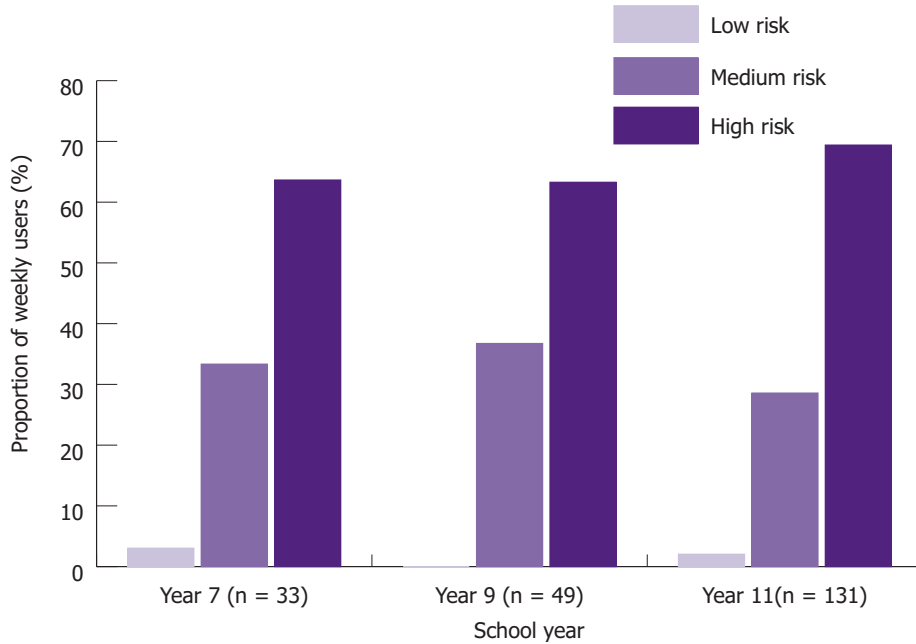


Figure 6.4 Proportion of weekly users of other illicit drugs in years 7, 9 and 11 by levels of risk



PART 4

THE EVIDENCE BASE FOR PREVENTION I: FROM EARLY CHILDHOOD TO ADOLESCENCE

CHAPTER 7: CHILDHOOD INTERVENTIONS

7.1 Summary

In this chapter, interventions aimed at improving developmental outcomes for children and their families are reported. Of the interventions beginning prior to birth, there is some evidence that family home visitation is a feasible implementation strategy with disadvantaged families and can improve developmental outcomes for children. There are a number of strategies developed for delivery from the pre-school age period that now have reasonable evidence for their effectiveness. There is also evidence that parent education programs, delivered through this period, can reduce child behaviour problems. School preparation programs appear to hold benefits in enhancing learning potential. These programs are being delivered from as early as six weeks after birth. Some of the strongest evidence for effectiveness in reducing harmful drug use comes from interventions delivered in the primary school years. Family intervention, parent education and school organisation and behaviour management programs all have reasonable evidence for their effectiveness in preventing the transition to harmful drug use. Much of the research has been completed in North America and many of the effective programs have not yet been implemented in Australia.

Intervention	Strength of evidence	Nature of evidence	Comments
Prior to Birth			
Preventing and delaying pregnancy in young and vulnerable mothers	☐ ^{0/0}	Little follow-up to the next generation	Few studies have examined drug use
Health service reorientation (antenatal)	☐ ^{2/3}	Studies observing professional behaviour	Universal approaches have not been studied
Family home visiting (antenatal)	★★	Small samples	Effects for selected population groups only
Infancy and Early Childhood (0 to 4)			
Health service reorientation	☐ ^{2/3}	Small observational studies	Universal approaches have not been studied
Family home visiting	★★	Small samples	Effects for selected population groups only
Parent education	★★	Small studies, limited follow-up	Effects deteriorate with time
School preparation programs	★★	Small studies, limited follow-up	Increasing emphasis on brain development in the first years
Primary School Age (5 to 11)			
Family intervention	★★	Some strong designs, mostly small studies	Some adolescent outcomes
Parent education	★★	Some strong designs, mostly small studies	Mostly short-term effects
School-based drug education	★ ^{7/12}	Need process studies	Social influences critical
School organisation and behaviour management	★★	Some strong designs	Adolescent follow-ups are being reported
Key:			
○	Limited investigation	★	Evidence for implementation
☒	Evidence is contra-indicative	★★	Evidence for outcome effectiveness
☐	Warrants further research	★★★	Evidence for effective dissemination

7.2 Prior to birth

Prior to birth interventions have been developed to address a number of intervention targets. Major intervention targets for these programs include: preventing teenage pregnancy, childbirth preparation and reducing foetal exposure to harmful drug use. Although a number of relevant programs have been implemented, and in some cases evaluations have been conducted, there have been few studies that enable assessment of the long-term impacts on reduction of harmful drug use.

7.2.1 Preventing and delaying pregnancy in young and vulnerable mothers

Definition: The use of a broad range of programs designed to prevent pregnancy amongst teenagers and vulnerable mothers. Strategies include: delaying the initiation of sexual activity, encouraging the use of contraception, reducing risky sexual behaviour and providing access to pregnancy termination.

Summary: Warrants further research  0/0

Due, in part, to the ready availability of pregnancy termination services, Australia does not currently have high rates of childbirth amongst teenagers. There are regions of high disadvantage, however, that are exceptions to this general rule. A recent review of overseas literature relevant to the prevention of sexual risk taking concluded that preventive strategies, such as school-based sex education and community mobilisation, have been successful in delaying pregnancy amongst young people with a high number of risk factors.¹⁴ Although there exists evidence for the successful implementation of these strategies, their outcome in preventing pre-birth exposure to drug use and drug use problems in future generations is unclear. There is evidence that in some cases, these programs may reduce harmful drug use in vulnerable young women.¹⁴ Further research in this area would appear warranted.

7.2.2 Health service reorientation

Definition: Reorientation of existing health services aimed at enhancing conditions for maternal and child health.

Summary: Warrants further research  2/4

Common themes for interventions to prevent adverse impacts on children of parental drug use include: facilitation to encourage child bonding during pregnancy; early identification of foetus or infant at risk or manifesting the effects of drug exposure, including early intervention to encourage

maternal abstinence; and education and training of family members, the community and the wider society.⁵³² Chabon *et al.* describe multiple assessment techniques, including review of medical and social history, observation, interviews with case workers and others, and mother-completed questionnaires. Assessment is argued to be useful for identifying drug-exposed children, informing treatment plans and evaluating treatment.⁵³²

Universal programs to discourage harmful maternal drug use

Several child health services are provided in Australia, with the aim of supporting expectant mothers and identifying conditions that might undermine healthy child development. The effectiveness of these efforts in reducing harmful maternal drug use is unknown.

Health service screening and assessment

Two studies have provided preliminary evidence addressing the feasibility of implementing screening and assessment interventions for pregnant women. In overview, results show some level of acceptance for these services but designs have generally not enabled behavioural outcomes to be clearly established.

Ettlinger used an alcohol screening process implemented by a maternal child health nurse and other health professionals.⁵³³ If mothers scored over the risk threshold, the nurse followed up with continued encouragement to not drink, brief intervention, or suggested community treatment resources. The health message was complemented with an educational pamphlet and a wallet-sized durable card listing a range of community resources. This program was evaluated with delivery to pregnant women ($n = 149$) enrolled in a supplemental nutrition program in a rural area of Vermont in the US. Of the mothers who were assessed, 5% self-reported alcohol problems. Nurses reported an increase in mothers coming forward and wanting to talk about alcohol risks. The authors concluded that training nurses about alcohol risk in pregnancy and giving them referral information was helpful in attempting to address these problems.

Chang *et al.* reported a randomised trial of a brief intervention for alcohol use in pregnancy.³¹ A selected sample of women enrolled in prenatal care in Boston were the focus ($n = 250$). All drank alcohol in the six months prior to assessment, 43% drank while pregnant and 40% satisfied DSM criteria for lifetime alcohol diagnoses. Of those invited to participate, 24% refused and these were more likely to be from minority populations. The intervention

involved a comprehensive assessment of alcohol use, or the same assessment plus a brief 45 minutes intervention by a health professional. The results showed that both groups reduced alcohol use after assessment (17% increased alcohol use), though there was no significant difference between groups in the size of the reduction. Of the 143 who were abstinent before the assessment, the brief intervention group maintained higher abstinence rates (86%) post the intervention than the assessment only group (72%) ($p=.04$). Drinking alcohol while pregnant was a strong predictor of postnatal drinking.

7.2.3 Family home visiting (antenatal)

Definition: Family home visiting involves a professional such as a nurse developing a relationship with a family over a period of time in the context of offering support, information, advice on infant health and development, and maternal health, and advocacy for service access. Relevant program targets in the antenatal period include reducing pre-birth exposure to harmful drug use, the family's harmful drug use, and reduction of early risk factors for the child's later involvement in drug abuse.

Summary: Evidence for outcome effectiveness ★★

Olds et al. evaluated a program involving regular home visiting by a nurse from late pregnancy until the child's second birthday for low income, unmarried and adolescent women having their first babies.⁵³⁴ The program focused upon supporting the mother, promoting positive attachment with the child and teaching parenting skills. Follow-up associated the program with reduced rates of smoking and alcohol use for the mothers during pregnancy, leading to reductions in cigarette and alcohol-related cognitive impairment in the children as pre-schoolers. The children have been followed up to age 15 years, documenting reductions in their early initiation of smoking and alcohol use.^{535, 536}

Conclusions—interventions prior to birth

There is some evidence that interventions prior to birth can be implemented and have some potential to improve maternal and child health. Although maternal alcohol use is relatively common in Australia, there has been little research investigating universal strategies to reduce alcohol use in pregnancy. Future investment in health service reorientation should focus on innovation to extend the range of service delivery models under investigation. Existing evidence supports the view that early home visitation strategies can be

implemented with at-risk families and when well implemented, this strategy can result in a variety of relevant early intervention outcomes.

There appears to be a role for drug treatment services to cooperate with other sections of government to ensure that quality home visitation services are targeted to all mothers experiencing drug use problems. The last 10 years have seen a large increase in the use of methadone treatment, with the consequence that an increasing number of children are being raised by parents who are undergoing this form of treatment. Investment is warranted to ensure positive child development within these potentially vulnerable families.

Many of the program strategies for the early years may have application for Indigenous populations. These applications are likely to be more successful where strategies are tailored to local communities by encouraging coalitions to take responsibility for implementation and management.

7.3 Infancy and early childhood (ages 0 to 4)

Major prevention strategies from birth through the pre-school years have included health service reorientation, family interventions, parent education and school preparation programs. There have been some longer-term follow-up evaluations in small samples, linking these programs with reductions in adolescent behaviours associated with harmful drug use. The evidence does demonstrate that exposure to these programs has resulted in improvements in childhood risk factors that have been linked to the development of harmful youth drug use.

7.3.1 Health service reorientation

Definition: Reorientation of existing health services aimed at enhancing conditions for healthy infant development.

Summary: Warrants further research [E] ^{2/3}

Better designing services to address the needs of infants and children may be an important strategy for encouraging healthy child development.

Universal programs supporting infant and maternal health

In all States and in most local governments, services are run to support mothers and encourage the healthy development of the infant. In a number of cases, service models have been developed to reduce the impact of maternal smoking and to assist families with problems associated with alcohol and

drug use. We have been unable to locate research evaluating the impact of these strategies on either maternal drug use or child development.

Paediatrician training

In view of the significant health effects posed to children by exposure to drug use (specifically environmental tobacco smoke—ETS), public health policies are needed to protect this vulnerable population.⁵³⁷ The evidence of effectiveness of interventions that have been tested in controlled circumstances does not provide much optimism;⁵³⁸ within the confines of the paediatric care environment, a recent systematic review of the literature indicates that there was no evidence that paediatricians are effective in reducing parental smoking. However, the evidence was much stronger for the capacity of paediatricians to increase knowledge about ETS. One interpretation of these results is that paediatricians may have insufficient continuity of care for this task. A systematic review is currently being conducted that will hopefully shed light on the evidence for interventions across all methods and sectors to reduce the exposure of children to tobacco smoke by carers and families.⁵³⁹

Specialist programs for mothers experiencing problems related to drug use

Copeland and Hall found that women with dependent children were more likely to be retained in treatment where services provided specialist support for childcare and parenting.⁵⁴⁰

There is a range of drug treatment programs, including specialist support facilities for mothers experiencing problems with drug use. There is some evidence that these programs may be more successful at encouraging mothers to remain abstinent from drug use.⁵⁴¹

Conclusions—health service reorientation

There appear to be opportunities for improving early child development through the reorientation of existing services, although strategies remain poorly developed. Currently there are many parents in drug treatment programs receiving no formal assistance for parenting and child development. By strategically coordinating and targeting service expansion across the early years, it should be possible to achieve advances in healthy child development.

7.3.2 Family home visiting

Definition: (see 7.2.3) Relevant program targets in the postnatal period include reducing infant exposure to harmful drug use, the family's harmful drug use, and reduction of early risk factors for the child's later involvement in drug use/abuse.

Summary: Evidence for outcome effectiveness ★★

Strategies for reducing family-level risk factors for drug abuse through the early years of life were recently reviewed for the NHMRC by Mitchell *et al.*⁴⁷⁸ That review concluded that the most well researched type of intervention targeting the antenatal and infancy period was professional home visiting, with savings and returns to government of around \$5 for every \$1 spent on the program over the first 15 years of the child's life. Intensive home visitation has been shown to be most cost-effective when provided as a selective intervention to women at increased risk, by virtue of factors such as young age, poverty, lack of partner support, and drug abuse. There is evidence that this strategy may not demonstrate benefits where it is applied more universally to include low-risk mothers.

An Australian study found some benefits for parents experiencing drug-related problems through a professional home visiting program.⁵⁴² Trends were documented amongst the parents for reductions in drug use and increased compliance with appointments. Interactions with their children showed some trends toward increased developmental stimulation opportunities at home and increased emotional responsiveness. Amongst the children, small increases in cognitive scores were observed at six months but these were not maintained at one year or 18 months. It may be that intervention needs to be maintained in the years following the child's birth in order to sustain the initial advantages gained through intervention.

Conclusions—family home visiting

Investment (in partnership with other sections of government responsible for infant, child and maternal health) should monitor the impact and cost of existing home visiting services in order to determine a framework for service expansion. Family home visiting has shown promise in both overseas and Australian trials/studies and existing evidence supports its cost-effectiveness.

7.3.3 Parent education

Definition: One or more parents receiving information and/or a course of instruction aimed at encouraging healthy child development. Delivery strategies include targeted, universal and combined interventions.

Summary: Evidence for outcome effectiveness ★★

The period immediately following birth is considered a critical time for the development of a strong bond between the mother and newborn infant. In some cases, postnatal depression or other factors can make early mother-child interaction difficult and, in this way, undermine the development of a positive relationship. The HUGS program was developed in Victoria as a group intervention to assist mothers to understand and respond appropriately to their infants' needs. Trained facilitators lead groups of parents through a sequenced curriculum consisting of six content areas. Each content area is covered in one to three sessions, of between one and 1.5 hours, at a set time each week. Meager and Milgrom reported a small trial of the program that demonstrated reduced levels of maternal depression at program completion, for mothers exposed to the program relative to controls.⁵⁴³

Step By Step Childcare is a prevention program designed to assist parents with intellectual disability, to enhance the healthy development of their children from birth to three years old. Parents receive individualised instruction in basic care tasks until they demonstrate performance of the task to a set criterion. Controlled evaluations have demonstrated that exposure to the program enhances parenting skills and also leads to improvements in child development outcomes. For example, Feldman *et al.* demonstrated that in families where parents received the parent-child interaction components, significant improvements in the child's language development were evident.⁵⁴⁴

Parent management training, based on cognitive social learning theory, is one of the most widely used parent education techniques. Parenting programs based on this theoretical approach aim to: reduce early child behaviour problems, improve parenting practices, and effect changes in the environment that will maintain and reinforce positive child development. These targets represent important risk factors for later adolescent drug abuse, delinquency and mental health problems.

Findings of a meta-analysis study generally support the efficacy of parent education programs as a strategy for reducing child behaviour problems. In this review, it was noted that compliance can be lower in families that have a high number of risk factors.⁵⁴⁵

Mitchell *et al.* report that these programs tend to have large effect sizes (0.86), with improvements observed for around two-thirds of participants.⁴⁷⁸ Interventions are successful in enrolling around two-thirds of those eligible. Typically, these programs are timed to prevent problem behaviours between the age of two to eight years; and to reduce problem behaviours, such as non-compliance and conduct disorder, early before they become resistant to treatment.⁴⁷⁸ Patterson suggests that families where young children already have established clinical problems typically require around 20 hours of direct contact program time.⁵⁴⁶

Intervention strategies to specifically address parent and family issues, such as marital distress, family violence, lack of a supportive partner, maternal depression, parent substance abuse and life stressors have been shown to improve the effectiveness of child outcomes. Programs such as Triple P Positive Parenting Program and some of Webster-Stratton's programs include specific program content to address these risk factors when necessary.⁵⁴⁷⁻⁵⁴⁹

Triple P Positive Parenting Program

The Triple P Positive Parenting Program is the most commonly implemented parenting program in Australia. Triple P is a multi-level program derived from more than 15 years of research and has been implemented and researched with a variety of different family populations. There are five levels of the program, provided to accommodate the differing severity in disrupted family functioning or child behaviour problems. At Level 1, universal media-based information campaigns are provided and at Level 5, individually tailored programs are provided to address more severe dysfunction.

The program is well supported through training events and a wide range of professionally developed materials. Recent research has included an outcome comparison of the Level 5 Triple-P, the Level 4 Standard, Self-directed Triple P and a waiting list control group for families with children between 36 and 48 months of age, with a behaviour problem (parent-reported) and at least one risk factor such as maternal depression, relationship conflict, etc. The results are presented post-intervention and at one year follow-up.⁵⁵⁰ All three intervention programs provided better outcomes (child behaviour and

parenting behaviours) than the waitlist comparison group and the Level 5 program was better than both the Level 4 programs, with the 'Standard' program better than the 'Self-directed' program results. At one year follow-up, however, there were no significant differences between the results of the three types of interventions.

Although there is already an impressive amount of Triple P research evidence and on-going research, further longer-term follow-up research would be helpful in terms of understanding the maintenance of outcomes. Also, the publication of the results of the comparison design evaluation of the Level 4 group Triple P program is awaited to inform policy and services as this is currently being widely implemented across Australia. The evaluations to date have generally been small efficacy trials under the control of researchers. Future research investigating program effectiveness in a range of service delivery and family contexts would be valuable in guiding future investment in this program.

Webster-Stratton's parenting curriculum

A series of parenting programs developed by Carol Webster-Stratton have been developed for use in universal applications and evaluated for their impacts in targeted populations with high levels of behaviour problems. There are different versions of the program for delivery in pre-school populations and for the early school-age period. Central components involve facilitated groups of parents and use of videotape examples to stimulate discussion and to convey parenting program components. The program has been evaluated in six randomised trials as an indicated or treatment intervention for behaviour problems in children aged three to eight years.⁵⁵¹ The results have been replicated by other researchers and in applied service efficacy evaluations. The program was also used and evaluated as a selective prevention program with other population groups such as 'Head Start' mothers, Hispanic mothers, and American-African mothers, in day-care centres.⁵⁵² In each of the evaluations, increases in positive parenting practices for participants have been associated with reductions in child behaviour problems.

Helping the Non-Compliant Child

Helping the Non-Compliant Child is an indicated and treatment intervention developed specifically for parents with non-compliant children aged three to eight years. The program is relatively intensive. A therapist works individually with the parents and

the child in a clinic setting. The program incorporates coaching: where the therapist communicates via an earpiece providing guidance as the mother plays with the child alone and the therapist observes the parent-child interaction through a one-way mirror. Other components include: modelling, role-playing and homework for eight to 10 sessions. Small randomised trials have demonstrated positive improvements following exposure to the program, in parenting practices and child behaviour.⁵⁵³ In one small longer-term study, 26 families where parents had completed the program were followed up. In these families, children had been assessed prior to entry to the program to have serious behaviour problems that tend to be stable predictors of longer-term developmental difficulties. When followed up in adolescence 14 years after program completion, and compared to community subjects of similar age and demographic characteristics, the children whose families completed the program appeared essentially normal. There were no differences on measures of drug use, internalising and externalising behaviours, social competence, emotional adjustment, relationship with parents and academic progress.⁵⁵⁴

Parent-child interaction therapy

The parent-child interaction treatment program was developed for children with conduct problems, aged two to six years, and their families.⁵⁵⁵ This is a group program that combines play therapy (using modelling, role playing, and coaching using microphones) with behaviour management training in a clinic playroom setting to assist parents build a warm and responsive relationship with their children and to manage their child's behaviour more effectively.

Small experimental trials have evaluated the program, finding significant improvements in child behaviour problems and in the interactions between the parent and the child, maintained to one to two years following treatment.⁵⁵⁶ Other studies have shown improved school behaviours.^{557, 558} One study showed that the parenting component had a larger outcome effect compared with the play component.⁵⁵⁹

Conclusions— pre-school parent education programs

There is now a substantial literature to document the value of early childhood parent education programs. Reviewers suggest that these programs may be amongst the more cost-effective of the currently evaluated early intervention approaches

designed to tackle child behaviour difficulties.^{545, 560–563} There are very little data on the effectiveness and appropriateness of the programs with different cultural groups, or with Indigenous families.

There are few studies that provide longitudinal outcomes greater than one to two years. From the data that have been collected, it appears that there can be reasonable maintenance of outcomes, particularly where parent-related difficulties or social adversity does not complicate the child's problems. There has been some longer-term follow-up work by Forehand and Long and their colleagues, where very small samples have been re-examined in adolescence and found not to have higher rates of drug use relative to matched community controls.⁵⁵⁴ Further research is needed, however, to establish whether these positive indications are more generally maintained across the various program and family contexts over time. Research is also required to establish whether positive changes observed in small efficacy trials can be translated to wider scale benefits through success in larger applications in real world delivery contexts (effectiveness).

The extent to which the benefits of parent education in childhood need to be supplemented through other strategies, such as school intervention, is not well understood. Webster-Stratton and others have noted deterioration of the positive effects of parent management programs over time.⁵⁵² Such observations suggest that the programs may need broadening to actively address other risk factors and to extend application through the pre-school and early school years, if their potential to reduce drug use and conduct problems is to be realised in later years. The feasibility and benefit of this type of coordinated approach is currently being investigated in the 'Fast Track' evaluation reported below.

7.3.4 School preparation programs

Definition: Programs aimed at better preparing children for the transition to primary school.

Summary: Evidence for outcome effectiveness ★★

An important developmental pathway for adjustment difficulties begins with the transition to primary school. Better preparing children for primary school is a practical strategy for improving the transition for vulnerable families.

The Carolina Abercedian Project was a North American program that addressed risk factors for later difficulties by providing support to disadvantaged parents, plus early childhood

education in the form of combined home visiting and pre-school centre-based intervention.⁵⁶⁴ The program was initiated for children as early as six weeks of age and was specifically designed to enhance cognitive, social, perceptual, language and motor development. Evaluation at the end of the pre-school program found that participating children had significantly higher IQ scores than controls, and at age 15 years follow-up they showed higher scores on reading and mathematics. Additionally, participating mothers became better educated and were more likely to find employment than the non-intervention group.⁵⁶⁴

In Sweden, research evaluated a day-care program for children from the first year of life.⁵⁶⁵ One hundred and twenty-eight children born in 1975 were followed from their first year of life. Participation in day-care (either a high quality day-care centre or a licensed family day-care home) was found to have positive effects on children's cognitive and socio-emotional development at follow-up when they were aged eight and 13 years. Teacher ratings showed that participating children outscored controls on several measures of socio-emotional functioning, such as confidence, ability to concentrate, creativity and social competence. These positive findings were sustained even after controlling for home background, child's gender and intelligence. School performance was highest amongst children who attended the program before age one year and the researchers attributed this to the importance of this very early period for brain development.

The Perry Pre-school project offered four half-days of structured pre-school experience combined with weekly home visits over one or two years for disadvantaged three and four year olds. In a small randomised design evaluation (123 African-American children with low IQ scores at age three years and living in families of low socioeconomic status—58 in the program group and 65 in the control group), participants in the program were shown to have significantly improved outcomes in the follow-up studies at ages three to 12, 14, 15, 19 and 27 years.

Evaluation found several long-term program effects to age 27 years, such as a lower incidence of drug use and teenage pregnancy, lower risk of high school drop out, increased likelihood of employment, and reduced reliance on welfare compared to non-intervention controls. Women suffered substantially less from mental health problems compared to those who did not participate in the Ypsilanti/High Scope program and

males from the program had considerably fewer arrests than those who were not exposed to the program.⁵⁶⁶

The Child Health and Education Study, a large longitudinal study from the United Kingdom, measured children's academic achievement and cognitive development based on whether they attended half-day pre-school, child care and/or play groups.⁵⁶⁷ Improved cognitive development and academic achievement in three and four year olds was found in those children who attended any form of organised group pre-school program compared to those who did not. Findings were independent of the child's socioeconomic status and the type of pre-school setting attended. Parental involvement was suggested as the strongest factor in determining positive child development outcomes, such as better vocabulary at ages five and 10 years, better reading and mathematics at age 10 and better interpersonal communication skills.

As a broad-based American early intervention program, Head Start (from age three to school age) and Early Head Start (from pregnancy to age three years) focus on improving early childhood opportunities for disadvantaged families. Evidence from evaluation of Head Start programs supports the conclusion that parental involvement is a characteristic of 'good' pre-school programs, leading to improved outcomes for children.⁵⁶⁸ Sustained gains in school and school attainment were suggested for white children. It was hypothesised that external factors, including influences from the school system, were responsible for reducing the effect of initial gains from the pre-school program, particularly among African-American children, as they became older.

Early Head Start offers centre-based, home-based and mixed approach options for families to provide child development services and build family and community partnerships. Evidence from evaluation of Early Head Start programs shows that although overall effects are modest, and show variation across different populations, there are positive impacts on cognitive, language and social-emotional development and parenting behaviours.⁵⁶⁹

Conclusions—school preparation programs

Although many evaluations appear to have been rigorous, many are based on very small samples. The studies completed to date do not answer whether any valid pre-school experience would have similar outcomes. A Pre-school Curriculum Comparison Study found few differences between the Perry Pre-school Program and another pre-

school curriculum although both of these, using a child-centred and teacher-initiated approach with opportunities for mastery experiences and child problem-solving practice, had significantly better outcomes than a standard pre-school program.⁵⁷⁰

There have been a series of cost benefit analyses of the 27 year Perry Pre-school Program study. The estimates of government savings vary from \$6 for every \$1 invested in the program for a one year program, \$3 for a two year program,^{571–573} and more recent estimates of \$2 savings for every dollar invested in the program.^{574, 575}

7.4 Primary school (ages 5 to 11)

From the entry to primary school, children are increasingly exposed to a broader range of influences. The role of teachers and experiences with other children increasingly shape development.

7.4.1 Family intervention

Definition: One or more parents, children and other family members receiving information, a course of instruction and/or therapeutic assistance, together, during the primary school age period; aimed at encouraging healthy family development. Services may be targeted to families in settings such as primary schools and family service centres.

Summary: Evidence for outcome effectiveness ★★

Although we have presented family programs targeting the primary and high school years separately, it is important to note that many of the programs in Australia actually bridge the transition from primary to high school ages. Furthermore, several programs that were originally developed for older or younger age groups have been adapted for wider implementation throughout schools. In other cases, programs were initially developed to target families with drug use problems and have since been adapted to target a broader section of the population.

Targeted approaches in primary school age

The Families and Schools Together (FAST) program targets families where students are identified by teachers to have behaviour, learning, or attendance problems in late primary school. Families are actively recruited through home visits. The initial program is professionally led and involves eight weekly two hour meetings involving a number of families.⁵⁷⁶ The meetings require considerable preparation and involve a variety of activities, including meals, contests and prizes. For a

component of each meeting, parents and children are separated into different activities. The last meeting is conducted as a graduation. Family networks are encouraged to maintain mutual support through a further two years of monthly family meetings run by graduating parents. The major intervention elements aim to build social support (social capital) for families within the school context, improve parent confidence and empower parents, improve family relationships and increase child competence.⁴⁶⁵ To date, evaluations have been limited to examinations of process but outcome evaluations are in process.⁵⁷⁷ The program has been successfully trialled in Victoria, beginning in 1997.

DeWitt *et al.* assessed an in-school program (Opening Doors) aimed at preventing or reducing drug use and other deviant behaviour in 167 high-risk youth during their transition from primary to secondary school.⁵⁷⁸ A student and parent program ran concurrently. All students in experimental and control schools completed a screening test on demographic and behavioural variables and high-risk students were selected. There was only room for 108 of the 170 identified high-risk students in the experimental group. High-risk participants in experimental and control groups completed a pre-test followed by a post-test one month after completion and a six month follow-up test. Although this was short-term follow-up, program participants compared with the control group reported less frequent: drinking, cannabis use, non-prescribed tranquilliser use, self-reported theft; and improved attitudes toward school. They also reported less supportive attitudes toward alcohol, tobacco and cannabis use and less risky drinking behaviour. There were no program effects on personal/social competence measures. The authors list possible reasons for success, including high retention rates during the 12 month study period, recruitment of community health care professionals to work with teachers, a comprehensive approach with a focus on promoting warm parent-child relations, peer and teacher relationships, support from whole school and emphasis on building life skills. There were, however, several limitations to this study, including non-random assignment of schools to test conditions; self-selection bias to enter program; failure of 42% of year 9s to participate in the screening, possibly because of need for parental consent; and evidence only available by self-report. This approach is, therefore, promising but requires a more rigorous evaluation.

Universal primary school approaches

In the last 10 years there has been steady growth of the knowledge base on involving families in child and adolescent health promotion. Several programs incorporate family involvement as a component of prevention programs run in schools or in community settings such as youth groups. Perry and colleagues involved in Project Northland in Minnesota⁵⁷⁹ and the Midwest Prevention Program team associated with Mary Ann Pentz⁵⁸⁰ have each evaluated school-based health education programs that include components aimed at involving families. Each of these evaluations has demonstrated that the incorporation of parent activities into school health education curricula can be a practical prevention option.

In general, evaluations have not been successful in untangling the specific contribution of family involvement to these prevention initiatives. Evaluation of Project Northland did demonstrate that, by year 8 of school, intervention students exposed to the program from grade 6 showed a small significant tendency to perceive better family communication relating to alcohol use.⁵⁷⁹

Perry and colleagues evaluated the impact of the Slick Tracy Home Team program, a set of activity books completed as homework tasks requiring parental assistance, over the course of four consecutive weeks in sixth grade (about age 11 years).⁵⁰⁶ The authors noted that the strategy of 'seeding' their program into school homework was successful in obtaining high rates of parental participation from a range of cultural backgrounds. At the end of sixth grade, families exposed to the intervention demonstrated increased communication regarding alcohol use, and children demonstrated lower initiation of smoking and regular alcohol use.

A smaller number of programs have evaluated universal (whole population) family intervention strategies. These programs used a range of strategies to encourage healthy family communication. The more intensive programs of this type provided professionally-led, sequenced groups for parents and children. Typically, programs either targeted all parents or selected samples in primary schools

The Iowa Strengthening Family Program (ISFP) developed out of Karol Kumpfer's successful experience running the Strengthening Americas' Families Program with high-risk families in drug treatment and disadvantaged community settings.⁵¹¹ The ISFP targets all families within late primary school (sixth grade). The sessions are structured

such that children and parents are in separate groups for the first hour and combine to one group to practice skills for the second hour. Young people's sessions in the ISFP focus on strengthening positive goals, dealing with stress and building social skills. Parent sessions focus on communication, monitoring and conflict resolution. A comparative evaluation suggested initially that the program was about as successful in discouraging alcohol use as a less intensive strategy of providing assistance to parents alone.⁵⁸¹ However, four year follow-up has suggested that benefits extend to reductions in youth hostile and aggressive behaviour,⁵⁸² and returns of just over \$9 for every \$1 invested in the program have been estimated.⁵⁸³ The future evaluation evidence for this program should be monitored to further establish its potential for preventing harmful youth drug use.

Targeted approaches in drug treatment settings

To break the inter-generational cycle of illicit drug abuse, interventions need to work effectively and early to ensure the healthy development of children in vulnerable families and, in this context, parents experiencing illicit drug use problems represent an important target. Program strategies have been evaluated, suggesting the practical potential of working with parents in drug treatment. Typically, programs are intensive and incorporate case management and home-based or group skills training for both parents and children.

Approaches that have been designed to assist parenting in drug treatment populations include the Focus on Families and the Strengthening Americas' Families Program. The Focus on Families program demonstrated reduced parental drug use and improved family management.⁵⁸⁴ The Strengthening Americas' Families Program demonstrated increased children's protective factors, reduced substance use in both adolescents and parents and improved parenting behaviours.⁵⁸⁵

In the case of the Focus on Families intervention, methadone treatment was supplemented with 33 sessions of family training (each 1 to 2 hours) combined with nine months of home-based case management. In their evaluation, Catalano *et al.* randomly assigned 144 parents and their 178 children (age range three to 14 years) to intervention and control conditions, repeating assessments at baseline, six months and 12 months after the intervention.⁵⁸⁴ Of the families assigned to the intervention, 74% were actively engaged. At the 12 month follow-up, parents exposed to the intervention showed less drug use (with cocaine and heroin usage reduced by two-thirds) and

increased problem-solving skills for avoiding drug use. The intervention reduced the exposure of the children to a range of family-level risk factors. Household rules were clearer, domestic conflict reduced and the children were in less contact with deviant peers. There was, however, little change noted in children's attitudes and the initiation of substance use was not different relative to controls. The lack of measurable impacts in childhood may have been because many were too young for attitude and behaviour change to manifest.

Conclusions—family intervention in families with primary school aged children

There is early evidence that moderately intensive family intervention, using strategies such as Focus on Families and Strengthening America's Families, can enhance treatment outcomes for parents in drug treatment and reduce risk factors for children. Long-term evaluation research will be required to build appropriate skills and ensure program effects can be replicated in the Australian context.

Although universal family intervention in primary school is a promising prevention strategy, it is more expensive than universal parent education and holds some risks if children with behaviour difficulties are encouraged to affiliate. Evaluation is required to establish whether these programs can achieve better outcomes than those obtained through parent education alone. Evaluation of programs, such as the Iowa Strengthening Families Program (ISFP), suggest that family intervention programs in late primary school may be a particularly useful strategy for reducing risk factors for youth alcohol use.

7.4.2 Parent education

Definition: One or more parents receive information and/or a course of instruction aimed at encouraging the healthy development of primary school aged children.

Summary: Evidence for outcome effectiveness ★★

Information relevant to the delivery of parent education programs for primary school aged children is summarised above. In overview, these programs have shown positive results reducing child behaviour problems and enhancing parent functioning.

The programs aim to provide training and information to all parents in a school context. Spoth *et al.* evaluated the delivery of the parent training program known as Preparing for the Drug Free Years (PDFY) in middle schools in the US State of Iowa.⁵¹¹ PDFY is a five session, professionally-led

program aimed at enhancing positive parent-child interactions, parent-child bonding and effective child management. Parents are encouraged to provide their children with opportunities for positive family involvement, teach their children skills for such involvement, and reward them for this involvement while providing appropriate consequences for rule violating behaviour. Of the eligible parents, 57% were willing to be involved in this parent training evaluation study. For those assigned to intervention, the program was demonstrated to be effective in increasing young people's intention to abstain from alcohol and in enhancing family bonding. Follow-up revealed that benefits in the form of reduced youth alcohol use were maintained two years after the intervention. Recent estimates suggest a return of just over \$5 for every \$1 invested in the program.⁵⁸³ The program has not yet been trialled in Australia.

Conclusions—parent education for families with primary school aged children

In an earlier section, a range of research was summarised supporting the view that parent education programs appear to show promise in small trials as strategies for addressing behaviour problems in early and late childhood. In this section, evidence was summarised supporting the view that parent education continues to provide a useful source of support for families through to the late primary school age period. From this period, follow-up studies have been conducted into adolescence, raising the possibility of evaluating impacts through to adolescent drug use.

The PDFY curriculum appears to be effective at addressing youth alcohol use and has been widely disseminated in the US. The relevance of this program in the Australian context remains unclear as the program has not been evaluated for delivery in Australia. In Australia, the more generic Triple P program has been widely disseminated and shows considerable promise. It is unclear whether parent education programs need to focus specifically on drug use through the primary school period; hence, a comparative trial examining drug use outcomes following exposure to a program such as Triple P versus the PDFY curriculum may be useful.

7.4.3 School-based drug education

Definition: Delivery of a structured social health, drug education curriculum within the primary school usually by classroom teachers, but in some cases by visiting outside professionals.

Summary: Evidence for implementation ★ 7/12

There is some agreement that the optimal time for introducing school-based drug education programs is in the late primary school or early high school years, when experimentation begins. Research relevant to these programs is summarised below in the section on high school aged youth. In this section, we consider the effectiveness of primary school drug education and discuss evidence for appropriate intervention activities.

Lloyd and colleagues have conducted a review of the effectiveness of primary school drug education targeted at children below 11 years of age, with the objective of preventing illicit drug use.⁵⁸⁶ There were few studies pertinent because of the length of time required for follow-up, but some promising studies included the Australian Illawarra Drug Education Program,^{587, 588} Project Charlie in the UK,⁵⁸⁹ and a new Hampshire Study.⁵⁹⁰ Toumbourou and colleagues also summarise evidence for a range of programs delivered in grades 5 and 6.¹⁴

There is some evidence to suggest that drug education programs may be less effective where they are initiated too early. Results from a 15 year school-based matched-pair randomised trial of the impact of a theory-based, social influences intervention on smoking prevalence among youth were published recently.⁵⁹¹ The Hutchinson Smoking Prevention Project (HSPP) was conducted in forty Washington school districts, between 1984 and 1999. Each district was randomly assigned to either the intervention or control condition. District pairs were matched on prevalence of high school tobacco use, school district size and location. Participants were children enrolled in two consecutive third grades (n = 8388) and follow-up continued until two years after completion of high school, with only 6% lost to follow-up. No differences were found in the prevalence of daily smoking between students in the intervention and control communities at year 12 or two years after high school.

The HSPP has generated ongoing correspondence on the effectiveness of school-based social influences approaches to long-term deterrence of smoking among youth. The HSPP was elegantly designed and included measures of implementation fidelity; hence, its longer-term failure highlighted the difficulties in maintaining behaviour change through drug education. Although the HSPP findings introduce an important caution, it is a single study, initiated at an early-age and conducted in small schools in primarily rural settings with primarily white youth.⁵⁹²

Based on evidence over the past decade, it might be cautiously argued that drug education curricula initiated in early high school (year 7 in most Australian States), and reinforced with additional program elements, provides a sound delivery strategy. One study found programs were more effective when delivered in year 7 rather than grade 6.⁵⁹³ Shope and colleagues found no benefit for grade 10 health education impact from earlier sixth grade exposure to health education.⁵⁹⁴

Attempting to translate the US research on early age drug education is difficult, as grade 6 in the US often represents the beginning of middle school rather than the end of primary school. Programs that start in grade 6 in the US face fewer difficulties in achieving an integrated sequence of follow-up activities in subsequent years. The finding that drug education initiated in grade 6, or earlier, is more effective when it is supported by ongoing drug education activities in subsequent years is a common theme in many studies. Several programs that supplemented activities initiated in grades four to six with further drug education activities in later years have reported reductions in drug use.^{595, 596} Many programs that provided drug education only in either fifth or sixth grade found either no behaviour change,⁵⁹⁴ behaviour change limited to only some sub-populations or behavioural targets,^{597, 598} or initial change that was not sustained.^{599, 600}

The available evaluation work reveals an expanding knowledge relevant to the elements of primary school drug education that appear effective in encouraging behaviour change. Effective programs have tended to address social influences and the development of positive peer relationships.^{587, 588}

The successful Illawarra Drug Education Program (IDEP) in New South Wales^{587, 588} targeted the developmentally appropriate drugs, with alcohol and tobacco, in particular, seen as 'gateway' drugs. The IDEP was designed to reduce uptake and assist students in decision making and resisting peer pressure in relation to drug use. The program was conducted over several weeks with grade 6 students; it included group work in which students designed art works and short dramatic sketches that demonstrated ways of coping with peer or media pressure to use drugs. Parents were invited to attend three drug education nights during this time, and during the final session, students presented the short plays they had worked on in class. In addition to this first phase of the program, a booster session occurred in year 7, when students showed videos of their plays and discussed the program with other

students and then returned to their primary schools to induct the new grade 6 students into the program.

Students who received the intervention reported greater ability to resist peer pressure than control subjects, and were more able to use drugs at a responsible and minimal level if they did engage in drug use. Despite positive program effects, year 9 appeared to be a critical time when greater experimentation with drugs occurred. The authors argued that this provided a strong case for booster sessions into the early years of secondary school. The authors concluded that life skills approaches presented to primary school children can impact on future smoking, alcohol consumption and illegal drug use.

A British study, Project Charlie, adopted a broad-based life skills approach to preventing drug use.⁵⁸⁹ The program's content focused on peer selection, decision making and problem solving and self-esteem enhancement, as well as providing information related to drug use. Although the evaluation sample sizes were small, results showed that students who received the intervention were significantly less likely to have used tobacco and illicit drugs than controls at four year follow-up.

In some cases, process measurement has identified program elements that do not appear helpful in changing behaviour. In one US study, fifth and sixth grade students (average age 10 years) in twenty schools in North Carolina were randomly assigned to either an intervention or a waiting list control condition. The intervention was the Drug Abuse Resistance Education (DARE) program. DARE is taught by uniformed police officers who are employed in the US by local counties. DARE uses discussion, role playing, behavioural modelling and extended practice to reinforce the curriculum. The 17 session program runs over four months and covers knowledge and attitudes (specifically the negative consequences of drug use), affective education (self-esteem and decision making skills) and alternatives to drug use (e.g. exercise and stress management). Over 1000 students were surveyed prior to the intervention and 91% also completed measures repeated at the end of the intervention. Relative to the control students, the DARE participants increased their awareness of the costs of using alcohol and cigarettes and of the media promotion of these substances. The program was also effective at improving assertiveness skills and at encouraging more negative attitudes towards drugs. Peers were also perceived to have more negative attitudes towards drugs. The problem for the DARE

program was that none of these changes were related to either students' intentions to use drugs or to their actual drug use.⁵⁹⁴

Why was DARE ineffective? It is possible that at age 10 years, drug use is less guided by attitudes and more by opportunity and social context factors. It is also likely that by the late primary years, a small but important high-risk minority of students feel alienated from school and may be attracted to 'bad' behaviours. Findings from the evaluation of DARE and similar programs have led researchers to the view that primary school drug education programs that focus on knowledge, attitudes and values alone may be of limited value. Although well intended, the DARE program failed to address important social influence factors including the family and older peer drug use. Despite many similar findings, the police involved with DARE have few opportunities to engage with research and appear reluctant to abandon what appears, from their immediate impressions, to be a positive program.

A program that has had some historical similarities to DARE is the Life Education program that has been widely used in Australian primary schools. Hawthorne reported a survey of drug education activities in Australian primary schools in 1992 that showed 43% were involved with the Life Education program. Relative to schools that were not involved, these schools were three times as likely to use ineffective 'knowledge/attitudes/values clarification' models of drug education. In an earlier survey of students Hawthorne had found associations between prior exposure to Life Education and higher rates of youth substance use.⁶⁰¹ In recent years, the Life Education program has made a considerable effort to address these problems, including developing and trialling a secondary school curriculum.

Controversy has surrounded the question of when to discuss specific drugs with children. Some programs have attempted to target programs to higher-risk children and this strategy has demonstrated some success.⁵⁷⁸ However, more generally, it appears unnecessary to specifically target drug education activities. A number of evaluations have revealed that effective drug education activities delivered to all students may provide either similar⁵⁹³ or enhanced impacts^{602, 603} for students with higher risk factors for harmful drug use.

Conclusion—school-based drug education in primary schools

The available evidence supports the view that primary school-based drug education has the

potential for short-term impacts on developmental risk factors and drug use behaviour, but longer-term behaviour change is not yet assured. The available evidence suggests that the curriculum should focus more on building relationships and social-emotional skills than on drug use. Future investment could examine process factors more carefully (including relationships, skills and intentions) as a preliminary to long-term follow-up.

7.4.4 School organisation and behaviour management

Definition: Programs run in primary schools to encourage positive interpersonal relationships at school, ensure effective discipline, and to maximise learning.

Summary: Evidence for outcome effectiveness ★★

Interactions with other students and with teachers during the primary school years play a formative role in the selection and development of peer relationships, relationships with adults, bonding to school and the development of identity and social competence. A number of programs have demonstrated that by altering the early primary school environment, long-term improvements in youth development are achievable. A critical lesson emerging through this work is that encouraging children who are not experiencing adjustment difficulties to better assist children who are experiencing difficulties can have profound impacts in healing childhood trajectories damaged through earlier developmental phases. Many of the impacts from intervention through this age period have been shown to be moderated by class and disadvantage, such that the most disadvantaged children experience some of the greatest benefits.

Improving primary school social environments

An important element of the school environment relates to classroom instructional practices. Efforts to modify classroom practices have been evaluated in the Seattle Social Development Project (SSDP). The SSDP aimed to modify practices in grade 1 and grade 7 classrooms in order to impact risk processes for later youth antisocial behaviour. The evaluation of the SSDP utilised a true experimental design. The intervention focussed on training teachers to employ more effective classroom management and instruction program components, in combination with a social competence curriculum, and parent training.

After one year of exposure to the SSDP, grade 7 experimental students showed significant increases in bonding to school, relative to controls. This effect

held for low-achieving students, as well. In addition, low-achieving experimental students, relative to low-achieving controls, had significantly smaller increases in school suspensions and expulsions. Evaluation evidence suggested that delivery of the program in early primary school was associated with the greatest long-term benefits. Long-term follow-up of the SSDP cohort has been maintained to age 25 years with 94% sample retention. Evidence has associated exposure to the program with long-term improvements in school bonding;⁶⁰⁴ reductions in school failure, drug abuse and delinquency;⁶⁰⁵ and reductions in sexual risk taking behaviour.⁶⁰⁶ The program appears to offer differential improvements for the most vulnerable students from low SES backgrounds.⁶⁰⁴ Considerable work has been completed to test the process of developmental change, linking exposure to the SSDP to improved adolescent health outcomes. The evidence supports the view that improvements in academic achievement and, in particular, school bonding have mediated many outcomes. In this study, improvements in school bonding in primary school led to better school bonding in secondary school. The SSDP was successfully replicated in Washington State in the late 1990s and it is understood that similar outcomes are being documented.

Another successful attempt to reduce antisocial behaviour in the primary school setting was the Linking the Interests of Families and Teachers (LIFT) program. The LIFT program was targeted to all grade 1 and grade 5 students. The program was composed of four elements: classroom social skills instruction for one hour twice a week for 10 weeks; playground behaviour monitoring (in the middle of the classroom instruction sessions, to reinforce social skills); six sessions of parent education (to assist parents to develop their child's social skills); and parent communication (including a weekly newsletter and a classroom phone answering machine for parents to leave a brief message for the teacher and to receive a daily message about classroom activities and homework). The playground behaviour monitoring was based on a variant of the 'Good Behaviour Game'. Students received individual rewards for positive social behaviours, but an additional reward was withheld from the group if negative behaviours were not reduced. This latter component was designed to increase the sense of responsibility in the group, for assisting children to improve their behaviour problems.

Evaluation was based on a randomised clinical trial involving 671 students and their families. Of the

full-time students enrolled in the selected grades, 85% of parents agreed to participate. Retention to the three year follow-up was 97%. Program fidelity was high and family satisfaction with the program was also high, particularly in grade 1. Immediate program impacts were: reduced physical aggression toward other students in the school ground, reductions in negative parent-child interactions, and improved teacher evaluations of social interaction between the children. Effects on behaviour were particularly pronounced for the children who were most aggressive at baseline. For the fifth graders, the three year outcomes were: lower rates of delinquent peer involvement, lower arrests and less initiation of alcohol and marijuana use. For the first grade students, there were large reductions (effect size 1.5) in the growth of inattentive, impulsive and hyperactive behaviour problems. Effects were equally large for the students who were most aggressive at baseline. The authors proposed that the intervention success with the more at-risk students arose through removal of the aversive interpersonal peer relationships that they were particularly vulnerable to.⁶⁰⁷

Kellam and colleagues provided an early demonstration of the importance of children's schoolyard relationships as a determinant of developmental outcomes. A study targeting aggressive/disruptive behaviour and reading achievement in junior primary school children was conducted to test if early intervention on antecedents associated with later tobacco use could impact on the uptake of smoking.⁶⁰⁸ Five urban areas over a range of socioeconomic levels were defined and three or four schools, where the students were of similar socioeconomic and ethnic mix, were selected from within each area. Two different interventions were tested: firstly, the classroom game targeting aggressive/disruptive behaviour (the Good Behaviour Game); and secondly, an enriched curriculum aimed at increasing reading achievement. The Good Behaviour Game used some similar intervention strategies to those subsequently adopted in the LIFT intervention. Students were rewarded, as a group, when disruptive behaviour levels were reduced, increasing the responsibility for children without behaviour problems to assist those experiencing such problems.

Within each area, one school was assigned to the Good Behaviour Game intervention, one to the reading achievement intervention, and the remaining one or two schools acted as controls. Within each intervention school, one first grade classroom was randomly selected to receive the

intervention and a second classroom served as an in-school control. Boys in the first intervention group were significantly less likely to start smoking than boys in the control group. Although smoking rates were reduced among boys in the reading achievement intervention, compared with the controls they were not significantly lower. No significant differences in later smoking behaviour were found for girls for either intervention.

A further example of a successful organisation program aimed to turn schools into caring communities of learners.⁶⁰⁹ Environments were fostered of supportive social relationships, a sense of common purpose, and commitment to pro-social values and responsiveness to children's sociocultural needs. The program was implemented in junior and middle schools from six school districts in the US. Similar schools from the same districts served as a comparison group. Data on problem behaviours over a three year period indicated the program was associated with significant reductions in student drug use and delinquency. Effects were strongest in schools that had the greatest fidelity of implementation.

The Fast Track program' —enhancing primary school education for disadvantaged groups

Fast Track is a multi-component prevention program that aims to reduce adolescent drug use problems, delinquency, risky sexual practices, school failure, mental health disorders, early conduct problems and harsh and inconsistent parenting. There is both a universal and a selective program that identifies families in the kindergarten year (age 6 years in the United States) and provides an integrated program of seven previously researched and evaluated interventions, from grades 1 to 10, addressing a range of risk factors for poor adolescent outcomes.

Fast Track is being implemented in the United States as a multi-site implementation and evaluation project. There are four different areas, all with high community crime and poverty profiles. The sites have families with different cultural characteristics and ethnicity profiles and the program is adapted to respond locally to these differences. There are 54 participating schools, randomly assigned to intervention or control.

The universal program provides the Promoting Alternative Thinking Strategies (PATHS) intervention for child social competence and healthy peer relationships (see Greenberg et al. for the previous PATHS program research).⁶¹⁰ This teacher-provided classroom curriculum aims to increase

emotional regulation and social-cognitive skills that enable positive friendships and non-aggressive behaviours.

All children are assessed for their risk factors in the kindergarten year, at mean age 6.5 years. Across all sites, the children scoring in the highest 10% for risk factor scores are invited to participate in the selective intervention program. The proportion of children, in different sites, participating in the selective intervention varies according to the level of risk in each school. Some schools may only have a few children and their families in the selective program, whereas other schools may have a high proportion.

Both the universal and selective programs are sequenced across school years to match the child's developmental progression. In grade 1 in the selective program, child and parent groups are provided for two hours a week on weekends or evenings; these groups are more frequent during the first school grade. Groups provide a parenting program (using elements from other previously researched parenting programs), child social skill training groups,^{611, 612} and academic tutoring.⁶¹³ The selective program also includes a home-visiting component and weekly phone contacts as an individual support component (using family-centred practice principles to build trusting relationships and family self-efficacy). The selective program children also have academic tutoring, using a phonetics-based program, three times a week during school hours.

Results of the evaluation of Fast Track have been published for the end of grade 1, in 1999 and, more recently, for the end of grade 3, in 2002.^{614–616} The end of grade 1 results illustrate the general direction of the outcomes.

For the universal classroom program at the end of grade 1 (for 6715 children—excluding the 845 high-risk children from the analysis) in intervention classrooms, aggressive child behaviours were lower compared with control classrooms when the curriculum was implemented with fidelity and high dosage.⁶¹⁴

For the selective program, there were 445 children in 191 classrooms in the intervention group and 446 children in 210 classrooms in the control group. At the end of year 1, intervention children had better emotional and social coping skills, better reading skills and language levels, and more positive peer relationships in school. Their parents had better parenting skills, with more warmth and involvement with their child; they also were more

appropriate and consistent in their parenting, with less harsh discipline and more positive school involvement. Parents reported high levels of satisfaction with the components of the program. The effect sizes were moderate. There was some lack of clarity about whether the program reduced child disruptive behaviour as the results with the various measures used were mixed. Non-biased observers reported significant reductions in disruptive behaviour, but overall, the parent- and teacher-reported results had no significant reductions.⁶¹⁵

The Fast Track program has been implemented in Western Australia in one school district, with positive preliminary results.

Classwide Peer Tutoring Program

Academic difficulty in the early school years is a risk factor for poor adolescent outcomes, including substance abuse. The Classwide Peer Tutoring Program was developed in the US (in Kansas) to improve early academic competence for children living in low-income areas. It is an instructional model, based on reciprocal peer tutoring that can be used at any grade, and has been found to have lasting outcome benefits on academic competence, at least three years later. It is designed to be incorporated flexibly into school curricula.

Students are pre-assessed on Fridays on their next week's work. From Monday to Thursday, they work with an assigned partner for 30 minutes; partners are assigned into two teams per class. Students take turns tutoring each other on their spelling, maths and reading, and work with reading comprehension questions. Points are awarded for both tutor and tutee. At the end of each week, students are individually tested on the week's work and pre-tested on the next week's work.

The program has been evaluated with large population groups, including a number of intervention and control outcome studies. These results show, for example, that students who participate in the program in grade 1 have better comprehension (in that grade) than students in grade 2 who have not participated in the program, and the students achieve 11% higher results on national standardised assessments three years later, in year 4. Students are also 20 to 70% more likely to stay on task and remain engaged with all lessons. The program has been used successfully with many population groups, including schools with many low-income children.^{617–621}

Conclusions—primary school organisation and behaviour management strategies

The existing research includes many well-controlled studies and suggests that interventions focusing on improving primary school environments can make an important contribution to reducing risk factors for drug use. In cases such as the Seattle Social Development Project and the LIFT intervention, cohorts exposed to the interventions have been followed over sufficient periods to enable exposure to these interventions to be linked to reductions in drug use. For other interventions, there are demonstrations that exposure to the interventions can reduce risk factors that have been shown to increase the risks of harmful drug use. Although interventions to improve primary school social environments appear to be promising areas for prevention investment, there has at this stage been little work published in Australia.

7.5 Conclusions—childhood intervention

There is increasing evidence that investment in preventive programs in childhood can contribute to the reduction of harmful drug use. The evidence for this claim relies upon demonstrations that these programs can be delivered to disadvantaged and vulnerable families, and evidence that such interventions make a difference in improving social environments for healthy child development. In many cases, evaluations have demonstrated positive improvements over one to two years in child behaviour problems. In an increasing number of studies, follow-up has been completed into adolescence, and these studies have linked the positive changes achieved through earlier preventive investment to reductions in harmful drug use and associated behaviour problems. There are demonstrations that investment in the years prior to school entry may be important for ensuring a fuller realisation of learning potential. Efforts to reform primary school environments in the LIFT program, the Good Behaviour Game, and the Seattle Social Development Project raise the interesting prospect that outcomes for the most disadvantaged children are greatly influenced by broader support and understanding within the school environment. Although childhood intervention appears to hold prospects for improving developmental outcomes for disadvantaged children, there are few Australian studies investigating these interventions. An important evaluation objective should include assessment of the relevance of both universal and targeted childhood interventions within Indigenous communities.

CHAPTER 8: INTERVENTIONS FOR ADOLESCENTS

8.1 Summary

A growing number of evaluations have examined outcomes of interventions during the secondary school years. Of the interventions targeting the secondary school age period, school drug education has been the most commonly evaluated strategy. The evidence suggests that short-term reduction in both drug use and progression to frequent drug use may be achievable through this strategy, but the prospects for longer-term behaviour change are still unclear. A growing number of evaluations have examined the impact of community mobilisation strategies. There is evidence that programs utilising this strategy can influence a range of youth drug use behaviours; however, impacts are not always superior to those achieved through the simpler strategy of drug education. There are promising early indications that parent education strategies, delivered through the adolescent phase, may prove useful for reducing a range of drug use behaviours. There were no published studies evaluating drug use outcomes associated with school organisation and behaviour management strategies in secondary schools. The success of these programs in primary schools, together with early evidence for their feasibility in secondary schools, supports the importance of evaluating their application in secondary schools. Health service reorientation programs are being trialled and evaluated for impacts on youth drug use. In overview, programs appear more successful where they maintain intervention activities over a number of years and incorporate more than one intervention strategy. There are many potential intervention areas where evaluations have not yet been reported. Conversely, there are interventions such as community drug education and peer education that appear relatively common in Australia yet are rarely evaluated, despite evidence in some applications that they have the potential to exacerbate problems. In a small number of studies, outcomes relevant to illicit drug use have been evaluated. More intensive strategies, including family intervention and preventive case management, are amongst the more promising strategies for preventing harms associated with illicit drug use amongst adolescents with a high number of risk factors.

Intervention Comments	Tobacco	Alcohol	Cannabis	Other illicit	Nature of evidence/
Parent education	Ⓜ 4/5	Ⓜ 3/5	Ⓜ 2/2	Ⓜ 1/1	Few programs address a single drug type
Family intervention	○	○	○	★ 4/4	Impacts relevant to illicit drug use can only be inferred from impacts on related behaviours
School-based drug education	★★	★	★	★ 1/1	Effects evident but tend to be weak and short-term.
School organisation and behaviour management	Ⓜ 0/0	Ⓜ 0/0	Ⓜ 0/0	Ⓜ 0/0	Successful in primary school applications and evidence for feasibility in secondary schools
Peer intervention and peer education	Ⓜ -1, +2/6	Ⓜ -1/1	Ⓜ 0/0	Ⓜ 0/0	Implemented to reduce drug related harm but there is little research
Youth sport and recreation programs	Ⓜ 0/1	Ⓜ 0/0	Ⓜ 0/0	Ⓜ 0/0	
Mentorship	○	○	Ⓜ 0/0	Ⓜ 0/0	
Community-based drug education	○	○	Ⓜ 0/0	Ⓜ -1, +1/2	One evaluation had negative outcomes
Preventive case management	○	○	○	Ⓜ 1/1	Australian application for youth with a high number of risk factors is emerging
Community mobilisation	★ 5/13	★★	★ 3/3	Ⓜ 0/0	Cost-effectiveness unclear
Health service reorientation	Ⓜ 1/3	★ 3/3	Ⓜ 0/0	Ⓜ 0/0	
Employment and training	○	○	○	○	
Social marketing	★ 2/6	★ 1/3	★ 2/2	○	May require delivery combined with other strategies
Law, regulation and policing	★★	★★	Ⓜ	○	Particular potential for wider implementation relevant to alcohol

Key:

- Limited investigation
- ☒ Evidence is contra-indicative
- Ⓜ Warrants further research
- ★ Evidence for implementation
- ★★ Evidence for outcome effectiveness
- ★★★ Evidence for effective dissemination

8.2 Adolescence (ages 12 to 24)

8.2.1 Background

For the current document, adolescence is defined as beginning at the age when Australian children start the transition from primary school into secondary school and continuing until the establishment of economic independence. The gradually increasing independence and mobility through adolescence introduce a greater range of social influences into the young person's life. Social changes, including technological advances and free market competition, mean that many adolescents face a higher educational threshold in order to enter employment. These changes underlie the current social trend for adolescents to spend more years in education and to delay into the late twenties transition from living with parents to independent living.⁶²²

8.2.2 Parent education

Definition: One or more parents receiving information and/or a course of instruction aimed at encouraging healthy family development. Delivery strategies include targeted, universal and combined interventions.

Parent education may range in intensity from the distribution of one-off messages using social marketing strategies, to self-help books or self-completed computer programs⁶²³ through to sequenced curriculum packages that may involve professional contact over multiple sessions.

Universal parent education approaches

Typically, between 10% and 50% of families can be encouraged to enrol in formal sequenced parent training programs when invitations are extended to all parents within a defined population (universal interventions). In their work in the rural US, Spoth *et al.* reported that parents who participated in parent education tended to have higher levels of education,⁶²⁴ however in the Australian evaluation of Parenting Adolescents a Creative Experience (PACE), disadvantaged and sole parent families were also successfully recruited.⁴⁸⁵

Secondary school parent education groups

An evaluation of the Australian PACE program targeted parents of early-adolescents.⁴⁸⁵ Designed as a universal intervention, facilitated groups, based on an adult learning model, utilised a curriculum that included adolescent communication, conflict resolution and adolescent development.⁶²⁵ One evaluation investigated the impact of seven week

PACE groups on a national sample of 3000 parents and year 8 adolescents. The evaluation included pre- and post-intervention surveys separated by three months for 577 families (parents and adolescents), representing a 60% response for those sampled from 14 schools targeted for intervention and 14 matched control schools. Although only around 10% of parents were successfully recruited into PACE groups, pre- and post-intervention findings demonstrated that benefits extended more broadly across families in the schools where PACE was offered. At the 12 week follow-up, parents and adolescents reported a reduction in family conflict. Adolescents reported increased maternal care, less delinquency, and less poly-drug use (the odds of transition to poly-drug use were halved).

Analysis suggested that intervention effects might have extended to youth with a high number of risk factors for drug use problems. The evaluation demonstrated that the parents recruited into the intervention were more frequently sole parents; and their children reported higher rates of family conflict and poly-drug use. At the post-test, family conflict and youth poly-drug use had reduced markedly in these families. Evaluation suggested that the drug use of respondents was influenced by their best friend's drug use. Improvements in troubled family relationships appeared to affect a wider group of families, not directly participating in the PACE groups, through changes in peer-friendship networks and through the program's efforts to encourage parents to assist other parents in their school community.⁴⁸⁵ The fact that the intervention and control groups were not randomly assigned, and the lack of long-term follow-up, suggest the need for caution in interpreting these promising early results.

Evidence that peer attachments may be risk factors for youth drug abuse has led to interventions to assist parents to better manage their children's peer relationships. Cohen and Rice evaluated an intervention that attempted to facilitate this adjustment. The intervention failed to produce changes in adolescent initiation of tobacco or alcohol use. Parent participation was poor, and, even among those who participated, attempting to influence their child's choice of peer group was not considered a practical target.⁶²⁶ Interventions for families with adolescents must be carefully designed as there are many tensions between issues such as youth requirements for autonomy and increasing family cohesion.

Integrating multi-level parent education within schools

Several research teams are currently active in developing multi-level family support programs for delivery within late primary or early secondary school. For example, Dishion and Kavanagh report a program involving the integration of three levels of support within school (early in US middle school when children are around 11 years old).⁶²⁷ At the universal level, all parents are invited to an in-school meeting, and written information and videos covering key parenting skills (cooperation in the home, supervision, problem solving and communication) are distributed. At the next level, a four hour 'family check-up' offers a family assessment and motivational interviewing to encourage accurate appraisal of child risk behaviour and the use of appropriate parenting resources. For families where problems are evident, more extended parent training is offered. The program is demonstrating some evidence for positive impacts, but longer-term outcomes are unclear.

Work is underway in Queensland schools to evaluate an adolescent version of the Triple-P Positive Parenting Program. Toumbourou and Gregg *et al.* are currently investigating the impact of an integrated multi-level secondary school intervention, Resilient Families, which incorporates communication training for students, an information night for parents, sequenced parent education groups, and brief family therapy. The project aims to further explore the assumption that community-based interventions can generate benefits beyond the minority of participants directly exposed to the intervention.⁶²⁸

Tobacco

Summary: Warrants further research  ^{4/5}

A number of programs have been developed though the Oregon Social Learning Centre to assist families managing child behaviour problems. Using social learning principles within an early-intervention framework, the aforementioned Tom Dishion and colleagues evaluated a 12 week parenting skills program aimed at families in which adolescents had exhibited behavioural problems in late childhood. Externalising behaviour problems were measured using both videotaped interactions and mother-reports on the Child Behaviour Check-list. Exposure to a parent group component reduced youth initiation to tobacco use one year later. Reduced parent-adolescent conflict was also associated with these positive changes. In alternative intervention conditions involving adolescent groups or

combining adolescent and parent groups, youth tobacco use and other problem behaviours increased. The authors argued the positive benefits of reduced parent-adolescent conflict were challenged in these cases by contrary peer influence pressures. Findings suggested the importance of strengthening the parental sub-system in family intervention through the adolescent phase.⁶³⁶

One of the issues to be addressed in parent education is the problem of engaging parents. In a recent US project addressing youth tobacco use, households were screened by phone to identify families with children in the age range 12 to 14 years. Of the 2400 families identified, 55% of parents and adolescents participated in a baseline phone survey and then half the parents were randomly assigned to participate in a program called Family Matters. The program involved mailing a sequence of four booklets to parents, with discussion with a phone counsellor after each mailing. Early booklets focused on motivating parents to make changes, and later booklets provided instruction on implementing family changes to improve communication and prevent youth substance use. Parents and adolescents were re-interviewed at the completion of the three month program, and again 12 months later. Relative to the controls, smoking onset was reduced by 16.4% for the youth in the families exposed to the intervention. The program had no impact on the initiation of alcohol use.⁶²⁹

Parent education approaches have been developed and evaluated as a component within multi-level programs aimed at addressing broader community factors that can undermine healthy youth development. Such programs typically incorporate community mobilisation activities as an adjunct to school-based health education; parental involvement is integrated in this context.^{580,593} It is often difficult to separate out the contribution of parent education in these programs. Pentz and colleagues reported a program that combined parent training in adolescent communication with school drug education and community mobilisation, including a parent organisation program for reviewing school prevention policy and skills. Available evidence suggested that 73% of parents participated in one or more of the program components.⁶³⁰ The program may have had some impact in reducing escalation (recent use in 30 days) in tobacco and marijuana use, but did not appear to influence alcohol use. In later analyses, youth using cigarettes at entry to the study were shown to reduce their use compared to similar students in the control communities.⁶³¹

Although the Australian evaluation of the PACE program did not specifically target tobacco use, there was some evidence that tobacco use was reduced where family relationships improved within peer networks.⁴⁸⁵ The intervention reported by Cohen and Rice failed to impact tobacco use.⁶²⁶

Available research suggests that parent education targeting the adolescent phase may be promising as a strategy for preventing adolescent tobacco use. As adolescent tobacco use is predicted by family-level risk factors, and there are some promising findings, there also exists a strong theoretical ground to assume that parent education may prove to be an effective strategy in reducing adolescent tobacco use. Further research in this area would appear warranted.

Alcohol

Summary: Warrants further research 3/5

Project Northland provides a further example of a community mobilisation program that, in this case, aimed at reducing youth alcohol use by incorporating parental involvement as one component within a wider set of school and community activities. A delayed entry to youth alcohol use was associated with changes to local laws and ordinances controlling alcohol sales to minors, improved family communication relating to alcohol use, and reductions in the perception that young people drank alcohol.⁵⁷⁹ In the evaluation of the Midwest Prevention Program, there was no initial impact on recent youth alcohol use (past 30 days);⁶³⁰ however, the program did appear to reduce progression to higher levels of alcohol use for youth who were alcohol users at the initiation of the program.⁶³¹

The PACE evaluation reported that getting drunk on alcohol was reduced where peers had better family relationships.⁴⁸⁵ The interventions reported by Cohen and Rice and Bauman and colleagues failed to impact the initiation of alcohol use.^{626, 629}

Research is insufficient to enable any conclusion to be made regarding the overall effectiveness of parent education for preventing adolescent alcohol use. As there are promising early indicators, further research in this area is recommended.

Cannabis

Summary: Warrants further research 2/2

There have been no published evaluations examining the application of parent training programs to specifically address adolescent cannabis use. In the evaluation of the Midwest Prevention

Program, parent involvement was included as one component within a wider set of community mobilisation activities and there appeared to be some evidence for an impact on recent cannabis use (past 30 days).⁶³⁰ Subsequent analyses suggested the program also influenced youth who were cannabis users at the initiation of the program.⁶³¹ The PACE evaluation revealed that cannabis use was reduced where peers had better family relationships.⁴⁸⁵

Rates of youth cannabis use have been high through the mid-1990s in Australia and current evidence suggests that family-level risk factors influence youth cannabis use. Given promising indications in the available evaluations, there would appear to be merit in developing and evaluating parent education programs for their impact on youth cannabis use.

Other illicit drug use

Summary: Warrants further research 1/1

There is evidence that parent education may be a potentially useful strategy to assist families facing a high number of risk factors for harmful youth drug use. Evaluations of work conducted through the Oregon Social Learning Centre suggest that parent education using behavioural and social learning principles can be useful in preventing further escalation of problems related to illicit drug use.

Targeting programs to parents in juvenile justice settings

Much of the research examining parent intervention focuses on efforts to prevent escalation or persistence in problem behaviours. Intensive interventions based on behavioural, social learning principles, and involving 44 hours of behavioural parent training, have been demonstrated to reduce offending and incarceration compared with standard juvenile justice contact.⁶³² It is likely that success in reducing crime and antisocial behaviour would also translate to reductions in harmful drug use.

Assisting parents concerned by youth illicit drug abuse

An Australian study investigated the intervention opportunity that can arise when parents initially recognise adolescent drug abuse. Parents in these situations often experience considerable distress, which can undermine effective responding. In an effort to provide a cost-effective method of assistance, Blyth et al. developed an eight week, professionally-led, group intervention known as the Behavioural Exchange Systems Training (BEST) program.⁶³³ High rates of depression among participating parents at pre-test (87% with high

symptoms on the General Health Questionnaire) were observed to drop substantially over the course of the intervention (down to 24% after eight weeks).⁶³⁴ A small evaluation incorporating a waitlist control group revealed differential improvements for those exposed to the intervention: in mental health, parental satisfaction, and assertive parenting behaviours.⁶³⁴ The impact of these changes on youth substance abuse is not yet known.

In a recent analysis of parent changes achieved through participation in the BEST program, Bamberg *et al.* noted that further reductions in youth drug abuse might have been achievable for approximately one-third of families had additional family intervention been provided at the end of the program.⁶³⁵ Future research should investigate the potential to curb youth substance abuse by adding behavioural training components as a follow-on intervention for parents who have completed the BEST program.

Including early intervention in the context of universal parent education.

The PACE evaluation revealed that parents were more likely to participate in the PACE groups if they were sole parents or their children were poly-drug users. The program appeared to positively affect early adolescent poly-drug use.⁴⁸⁵

8.2.3 Conclusions—parent education programs in Australia

As reported in the previous chapter, evaluation research in the US demonstrated that the Preparing for the Drug Free Years curriculum appeared promising as a strategy for delaying the initiation of alcohol use when delivered to families with late primary school-age children. In this section, evidence was presented revealing that a similar program strategy, using the Australian PACE program, also showed promise as a method for reducing early youth drug use when delivered within secondary schools. The Victorian State Government is currently investigating the development and application of a program strategy related to that adopted in the PACE evaluation (called ABCD).

Although the model of sequenced parent groups is emerging as a useful program approach for parent education, there are alternative models, such as phone counselling, that are being trialled with positive results. Future investment should encourage further innovation in service delivery models. Investment in at least one large randomised

controlled trial with long-term follow-up would also appear warranted to ensure that the promising early indications for the Australian PACE program can be replicated and sustained to achieve longer-term reductions in youth drug use. Funding for such an investment might be organised as a partnership between Australian Government and State agencies, targeting substance abuse prevention, crime prevention and mental health promotion.

More intensive parent education has also been investigated for delivery in settings such as juvenile justice and youth drug abuse treatment. In these applications, the approach appears feasible although further research will be required to establish whether this strategy can prevent harmful drug use.

8.2.4 Family intervention

Definition: One or more parents, adolescents and other family members receiving information, a course of instruction or therapy together, aimed at encouraging healthy family development.

Family intervention programs have been based on a variety of theoretical frameworks including family systems theories and social learning approaches. In their application in families with one or more adolescents, parents and offspring participate in the programs together; the balance of program time devoted to such components, relative to activities that provide instruction to adolescents and parents separately, varies.

Tobacco

Summary: Limited investigation O

There is evidence that family factors influence adolescent tobacco use. In the trial reported by Dishion,⁶³⁶ family intervention, involving the parents and the child, was less effective at reducing tobacco use in high-risk youth than parent education alone. The components provided separately to the at-risk adolescents were considered to exacerbate antisocial peer involvement and thereby undermined the effective parent education components.

Alcohol

Summary: Limited investigation O

The evaluation of the delivery of the Iowa Strengthening Family Program (ISFP) in late primary school suggested the program was successful in reducing alcohol use and related risk factors.⁵⁸¹ The development and evaluation of a similar strategy in early secondary school may be considered. However, it should be noted that early

secondary school is a period when there are high risks for affiliation with drug using peers, and hence dangers to be managed in implementing the peer components entailed in the ISFP.

Cannabis

Summary: Limited investigation ○

There have been no evaluations of the delivery of family intervention programs in secondary school to reduce youth cannabis use. It should be noted that early secondary school is a period when there are high risks for affiliation with drug using peers, and hence dangers to be managed in implementing peer components of current family intervention programs. Family therapy models are used in Australia to assist families facing difficulties with youth cannabis use, but there has been little evaluation.

Illicit drug use

Summary: Evidence for implementation ★ 4/4

A family intervention program with some elements of preventive casework, the Targeted Adolescent/Family Multi systems Intervention (TAFMI), used an individual-focused intervention to assist students and involve parents. The program was targeted to late primary/early secondary school students evidencing poor school performance and drug misuse or abuse. A therapist held weekly meetings with the students and their families. Early meetings focused on setting behaviour and academic improvement goals with the student. The student and family were then assisted toward achieving these objectives using evidence-based strategies. Behaviour changes for those exposed to the intervention were compared against a randomly assigned control group who received usual school counselling. Differences between the groups were not observed until the second year, at which time drug use was lower for the intervention group.⁶³⁷

8.2.5 Encouraging positive family relationships for youth in drug treatment and juvenile justice settings

Family interventions targeting multiple risk families are typically conducted in settings such as drug treatment, juvenile justice and school welfare. Family therapy is often approached reluctantly by government, due to perceptions of undefined length and expense. However, considerable work has been done to better quantify the investment required. Several research teams have presented evidence supporting the effectiveness of manualised forms of family therapy in the treatment of youth

drug abuse.^{638,639} Santisteban et al. described active recruitment methods that can be successfully employed in interventions aiming to attract disadvantaged families or youth with specific problems such as drug abuse.⁶⁴⁰

The Addicts and Families Project was historically important in its use of a well-controlled evaluation to demonstrate the effectiveness of family therapy as a treatment for youth drug abuse.⁶⁴¹ The study demonstrated that, after six months, supplementing methadone treatment with family therapy reduced drug use in around two-thirds of cases.

Functional Family Therapy (FFT) has provided leadership in the movement to disseminate brief family therapy using a clearly-staged (readily taught) family counselling program, involving as little as eight hours of therapist contact. Evaluations of FFT have demonstrated reductions in juvenile justice expenditure.^{642, 643} The program has demonstrated evidence as a strategy for reducing re-offending amongst voluntary and court-mandated adolescent offenders, and has also been demonstrated to prevent offending amongst the younger siblings of targeted offenders. In their review, Bry, Catalano et al. found reductions in recidivism ranged from between 75% for less severe offenders down to 35% for severe offenders.⁶³⁷ Aos et al. reported the net economic benefit at around \$4 for each \$1 invested in FFT.⁶⁴⁴ Process evaluation has suggested a critical program component may involve reframing problem attribution away from individual blame, to focus on the concept of a mismatch in family needs.⁶⁴⁵ If this is accepted, it suggests that a critical transition in the escalation from delinquency to serious crime may be linked with hostility generated in family relationships through adolescence. Although FFT has been disseminated widely in the US there has been only one brief training in Australia.

Although important, the family is only one of the social systems influencing adolescent development. Henggeler and colleagues have used randomised controlled trials to evaluate the impact of their Multisystemic Treatment (MST) program on serious juvenile offenders.⁶⁴⁶⁻⁶⁴⁸ MST has a large component of preventive case management but is based on family systems principles and extends assistance by including effective intervention strategies to enhance individual competence, tackle peer relationship issues, and to ensure access to work, education and community resources.

Exposure to MST reduced offending and re-arrests relative to usual juvenile justice practices.⁶⁴⁸ MST appeared more effective than individual counselling

in reducing antisocial behaviour for serious adolescent offenders.⁶⁴⁶ MST begins with assistance for the young person and their family, to establish treatment goals and objectives. Clinicians are trained in the application of evidence-based therapies and rewarded for achievement of agreed client outcomes. MST has been effective in engaging families with multiple and complex problems.⁶⁴⁹ The net economic benefit has been estimated at around \$5 for each \$1 invested in MST.⁶⁴⁴ MST training has been disseminated widely in the US and a project has recently been established in New Zealand.

8.2.6 Conclusions—family intervention

Investment in both brief family therapy and the Multisystemic Treatment (MST) model appear warranted for juvenile justice and youth drug abuse settings. Since programs of this type have a track record of dissemination in applications in the US, investment in these programs may be justifiable in Australia without awaiting long-term follow-up research. The skills required to engage youth and families in these interventions do not appear to be well developed in Australia. For this reason, investment in overseas trainers may be warranted in the context of at least one demonstration project focusing on process evaluation and training, to ensure the achievement of critical program components. Juvenile justice programs would be logical partners in this type of investment.

Investment in at least one randomised controlled trial, including three to four years of follow-up, would appear warranted. Investment of this type would be appropriate for research funding from agencies such as the National Health and Medical Research Council, the Criminology Research Council and relevant State health promotion foundations. Alcohol and drug sector funds could seed research support by providing money for training and dissemination.

8.3 School-based drug education

Definition: Efforts to reduce drug-related harm through the delivery of a structured social health education curriculum within the school, usually by classroom teachers, but in some cases by visiting outside professionals.

There have been two recent and comprehensive critical literature reviews on drug education in schools, conducted in Australia for government departments.^{650, 651} These describe the evolution of approaches to drug education in schools since the

1930s to the present day. The reviews also present the factors that have been shown in experimental trials to maximise the effectiveness of programs in preventing or delaying the onset of drug use and in reducing use. Other reviews in recent times present similar conclusions.^{586, 652–654} The more successful approaches to drug education have a grounding in what is known about the causes of adolescent drug use, adolescent developmental pathways in relation to drug use, and the psychological theoretical frameworks of social learning and problem behaviour.⁶⁵⁵ Because this body of evidence has been well-established over several decades of research, the authors sensibly caution those considering developing drug education programs to base them on what is known rather than what seems intuitive or ideologically sound. Poorly conceptualised programs have historically been ineffective or, at worst, actually harmful, for example by increasing drug use.⁶⁵⁰ Factors associated with effective substance use programs in schools are as follows.^{520, 656–659}

Programs should:

- be research-based/theory driven,
- deliver coherent and consistent messages,
- present developmentally appropriate, balanced information,
- provide resistance skills training,
- incorporate normative education,
- educate before behavioural patterns are established,
- relate strategies to objectives,
- address values, attitudes and behaviours of the individual and community,
- address the inter-relationship between individuals, social context and drug use,
- focus on prevalent and harmful drug use,
- make judicious use of peer leadership,
- be delivered within an overall framework of harm minimisation,
- incorporate broader social skills training and be part of a comprehensive health education curriculum,
- employ interactive teaching approaches,
- ensure optimal training and support for teachers,

- provide adequate initial coverage and continued follow-up in booster sessions,
- be sensitive to cultural characteristics of the target audience,
- incorporate additional family, community, media and special population components,
- ensure fidelity of implementation, and
- be evaluated.

The explanation of these factors and the papers from which they derive are presented in reviews by Midford, Lenton and colleagues.^{650,651} The authors of both Australian reviews have also summarised the work of Tobler *et al.* into a useful table of 'what works and what doesn't' in cannabis and other drug prevention programs in terms of content and delivery features.⁶⁶⁰ Tobler and colleagues derived this information from a meta-analysis of 120 school-based adolescent drug prevention programs.⁶⁶¹

Readers should refer to either review for the full discussion and references of successful drug education approaches.^{650,651} The main points are reiterated here. Successful drug education programs use the social influence approach, or multiple component programs, with a large emphasis on the social influences rather than information-based approaches alone or those targeting affective education alone. Affective education approaches were based on the assumption that youth who used substances had personal deficiencies; by enhancing personal development with training in self-esteem, decision making, values clarification, goal setting and stress management, the use of drugs would decrease. These programs did not succeed in consistently changing behaviour, perhaps because not all youth using substances suffer from personal deficiencies. Indeed, some research has suggested that young people who engage in minor drug experimentation may be better adjusted than those who maintain complete abstinence, while frequent/heavy drug users tend to be poorly adjusted.

The social influence approach was developed from Bandura's social modelling theory⁶⁶² and McGuire's social inoculation/resistance training.⁶⁶³ Initial formulations of this approach were based on the belief that young people begin to use substances because of social pressures from a variety of sources, including mass media, peers, family and the image they have of themselves. To successfully resist the adoption of undesirable behaviour, young people need to be inoculated by prior exposure to counter arguments and have the opportunity to

practise the desired coping behaviour. Other formulations are more complex and consider a competition for behavioural identification between different social influences such as peers and parents.^{479, 515} Peer subcultures are increasingly associated with new illicit drug use trends, while parents may either attempt to limit drug use or introduce adolescents to their familial patterns of drug use. In the context of complex and contrary social influence pressures, it is not surprising that there has been some variation in outcomes for social influence programs across different social contexts.

Despite the challenges, variants of the social influence approach have been shown to have benefits in reducing antisocial behaviour, affiliation with deviant peers and school behaviour problems; and increasing academic performance and commitment to schooling. Booster sessions added at critical points of developmental transition, a complementing parenting component, and reinforcement of social messages at the broader community level seem to strengthen the effects of social influence school-based programs.¹⁴

8.3.1 Life skills training

An historically important social influence approach by Botvin and colleagues is Life Skills Training (LST).⁶⁶⁴ This strategy brought an emphasis on the personal and social skills that underpin lifestyle and health risk behaviour more generally. In addition to addressing tobacco advertising and social resistance skills, the program deals with managing anxiety, communicating effectively, developing personal relationships and asserting one's individual rights. The program is more elaborate than earlier health educational packages, with teacher manuals, ongoing professional development of teachers during implementation, student guides and a relaxation audiotape. Various formats have been evaluated but a common delivery strategy consists of 15 classes in year 7, with 10 booster sessions in year 8 and five in year 9.

The LST program has been evaluated in ten separate studies and seems to have reduced alcohol, cannabis and tobacco use into early adulthood.⁶⁶⁵ It was evaluated in (a sample of close to 6000) year 7 students allocated to three treatment conditions (two active and one control). Six years later, in 1991, follow-up data were collected from 3597 students (60% of the original sample of 5954). Significant reductions were found in the prevalence of smoking (22% versus 33%) and drinking to the point of being drunk (34% versus 40%). Rates of weekly poly-drug use were halved in the

intervention sample (3% versus 6%). Reductions in the group who received at least 60% of the intervention program were even more substantial.⁶⁵² In a recent update study, students were completing secondary school in grade 12. Self-report data collected by mail from 447 of these individuals showed that those who received life skills training reported less illicit drug use compared to the control group.⁶⁶⁶ These findings hold promise that targeting gateway substances such as alcohol and tobacco can prevent illicit drug use and that long-term prevention effects may be possible. The limitations of this study, however, are the small sample size and the predominance of white respondents (92%), along with the possibility that the sample was not representative of high-risk individuals. Although the LST approach appears promising, replication efforts can face difficulties. Gorman has critiqued the evaluations of LST approaches and noted that while some evaluation studies produced significant education effects, most indicated no change due to the intervention.⁶⁶⁷ In addition, those reporting significant change had conducted many comparisons such that some changes may have occurred by chance. In some cases, analyses reported only on efficacy, regrouping intervention data to focus on successful implementations. Some studies had small numbers and collapsed variables into dichotomised scales that may have influenced significance. The LST programs may require 30 sessions throughout secondary school and this substantial time commitment may be difficult for some schools to accommodate.

8.3.2 Peer educators and interactive programming

Use of peer leaders has been another strategy reported in the literature that was reviewed by Midford, Lenton and Handcock.⁶⁵⁰ Evidence shows that peer educators can be important when they model attitudes unfavourable to drug use. Peer leaders need to be selected carefully and well supported with management skills from professional teachers. Peer educators need to be credible with high-risk young people, have good communication skills and show responsible attitudes, but simultaneously be unconventional. Hence, the 'good' students selected by adults may be inappropriate if peers don't engage with them, while in poorly managed programs there is the risk that 'cool' students will encourage favourable attitudes to drug use. In the meta-analysis by Tobler and Stratton, peer education produced similar results to other interactive programs presented by teachers and other leaders.⁶⁶¹ It may, therefore, be

the interactive programs which engage students in role-play, discussion and games that are a key factor in effectiveness.

8.3.3 Normative education

Hansen and Graham ran a study where students received one of four curricula: information alone, information plus resistance skills training, information plus normative beliefs, or, all three components.⁴⁹⁸ Students exposed to the programs where normative beliefs were included significantly decreased alcohol use after one year compared to those in the alternative conditions. Students often over-estimated the proportion of their age group who used substances, and student surveys on substance use and feedback encouraged more realistic assessments. In their conclusions, Hansen and Graham argued that normative components may play a critical role in activating students to utilise peer resistance strategies.⁴⁹⁸ In the absence of a normative component, resistance training appeared relatively ineffective.

8.3.4 Timing and intensity of training

Timing of education is critical according to some researchers. The consensus is that the optimal time for introducing youth preventive programs is late primary school or early secondary school, when experimentation often begins. This may also help to capture higher-risk individuals who may leave school early. Junior programs should be generic as the most effective programs for reducing cannabis use at this stage are also effective in reducing tobacco and alcohol use.⁶⁵⁰ However, onset of use can vary in different populations and with different types of drugs so timing of programs should be adjusted according to prevalence data for use of a particular drug. For instance, findings from cannabis education programs in senior secondary school suggest that a more differentiated approach is required with older students.

Based on evidence over the past decade, it might be cautiously argued that health education curricula initiated in early secondary school (year 7) and reinforced with additional programs provide a sound delivery strategy.⁵⁹³

The intensity of the intervention may also be important in its success. It appears that most of the successful programs are intensive and long-term (including booster sessions). Of the 10 soundly evaluated effective programs reviewed by White and Pitts,⁶⁵⁴ eight had 10 or more sessions devoted to delivery of the program and booster sessions. However, intensity did not guarantee effectiveness,

an example being the DARE program that was intense in number of sessions but ineffective.

8.3.5 Fidelity of implementation and dissemination

Hansen and McNeal conducted a study into how drug education programs are implemented by teachers when there is not a specific management program in place.⁶⁶⁸ This was in response to data, in 1996, that teenage drug problems were rising despite significant advances in best practice of drug education. They observed teaching in 12 middle schools in Forsyth County, US, amounting to 2828 minutes of instruction, equivalent to 232 distinct class periods of which 146 were reported. They found that the teachers observed lacked a general understanding about the concepts underpinning existing drug prevention approaches. They tended, more often, to focus on the knowledge aspects of the program, in particular those about health-related consequences of drug use, while paying minimal attention to resistance skills training, value clarification and normative education. In addition, teachers tended to emphasise alcohol, tobacco and less so cannabis in their lessons. Cocaine was discussed 20% of the time, despite having low usage rates among students, and amphetamines and inhalants discussed rarely. The teachers observed were very individual in their teaching approaches, the substances they focused on and the life skills they included. The authors concluded that if these findings were typical of schools elsewhere, drug education would fail to make a long-term impact on substance use behaviours. They recommended that there should be a focus on increasing teachers' conceptual understanding of drug use and prevention, and of normal patterns of drug use onset and experimentation. They also recommended increasing training for building allegiance to research-based prevention strategies, and for adoption of the program components that have been shown to mediate impacts on drug use. It seems that teachers need support and access to good materials to work with, and that this support from a school organisational level would be important.

8.3.6 Targeted versus universal interventions

Most of the studies evaluating drug education have emanated from the US, where the focus is on universal strategies to prevent or delay the onset of drug use. There have been too few interventions targeting young people at different stages of their drug use and from different social and cultural backgrounds. However, some studies have

investigated the effectiveness of interventions for different populations and tailored for different target groups.⁶⁵⁴ In contrast to the many studies of drug use in people of school age, there is little about progression of drug use into young adulthood and factors associated with vulnerability and resistance in this time period.⁶⁵⁴ Such knowledge of the 'where, when and why' drugs are being used, and the meaning drug use has to the user at different stages, will be necessary for formulation of targeted interventions.

8.3.7 Health education as a component within broader community mobilisation

Mary Ann Pentz and colleagues examined the effects of a school drug education program run in the context of the Midwest Prevention Program, a comprehensive community mobilisation program.^{580, 593} First, a 10 session health education program focusing on drug use resistance skills was delivered to grade 6 and 7 students. Evaluation suggested positive program impacts on mediating factors (attitudes, knowledge, skills and peer influence) and on initiation and escalation in use of tobacco, alcohol and marijuana use after the first year. A three year follow-up combined the drug education program with a parent organisation program for reviewing school prevention policy and training parents in positive parent-child communication skills in the context of community mobilisation elements.⁵⁹³ The program appeared to be effective at preventing escalation in tobacco and marijuana use, but not alcohol use. Effects were most prominent when delivery occurred in year 7.

Research reported by Perry and colleagues provides further insight into the effectiveness of health education delivered within the context of wider community mobilisation efforts. It would appear from the Project Northland research that the common observation that educational impacts decay over time also applies to interventions run in the context of wider community mobilisation.⁶⁶⁹ A cohort exposed to a social influence health education curriculum from year 6 through to year 9 demonstrated lower rates of recent alcohol use and alcohol misuse. These effects tended to decline in the years following the intervention such that there were few significant effects by year 12.

Tobacco

Summary: Evidence for outcome effectiveness ★★

Drug education addressing a single drug may be difficult to implement given the competitive pressures within schools for a range of material to

be integrated into the curriculum. There is an argument, therefore, that programs should be generic; the most effective programs for reducing tobacco use at this stage may be effective in reducing cannabis and alcohol use.⁶⁵⁰

An early popular example of the application of a social learning approach to tobacco health education was the Minnesota smoking prevention program.⁶⁷⁰ The program was delivered by teachers and incorporated a structured series of lessons and development of a teaching strategy that allowed pupil-led discussion. The program content addressed cigarette advertising, the physical effects of smoking and refusal strategies. US findings were positive in bringing short-term reductions in smoking but translation of the program to other settings has not always met with a similar degree of success.⁶⁷¹ An Australian adaptation of this program, with both teacher and peer-led components, was implemented to over 2000 year 7 students in Western Australia, in 1981. At seven year follow-up, no persisting effect of the program was found in males but in females there was a 50% lower rate of tobacco use in those who had been non-smokers at the outset of the program. This study was marred by a low response rate at follow-up (55%) but adjusting for differential attrition of smokers did suggest an ongoing effect in females.

Two notable European studies have also produced longer-term follow-up findings on the use of interventions based on social learning theory. The Oslo Youth Study was based on the Know Your Body risk factor assessment program. The initial study took place with 827 students in six Oslo schools. The program was in part peer-led and focused on developing social resistance skills, making a public commitment to being a non-smoker, and on broad discussions of the social, political and health aspects of smoking. The program had a significant effect on smoking in males at 12 year follow-up but not in females. It is noteworthy that daily smoking rates in the comparison populations at follow-up were very high (close to 50%). In general, the size of all the short-term health effects in this program diminished over time.⁵⁹⁹

The North Karelia Youth Project focused on social resistance skills in 10 classroom sessions, with assistance from peer leaders. Effects on smoking rates were clearest at follow-up at two years, where 23% of participants were smokers compared with 38% in controls. At eight year follow-up, rates were 37% and 47% respectively.⁶⁷²

There have now been a number of systematic reviews conducted on school-based programs designed to prevent smoking in young people. The findings from several of these reviews were summarised, in 1999.⁶⁷³ A synopsis of the results presented in that review is given below.

One review was restricted to randomised controlled trials (RCTs) that targeted individuals up to 18 years of age; the findings are based on a qualitative synthesis of this literature.⁶⁷⁴ Over 60 primary studies were identified but only 11 were considered to be of high quality. The 11 studies all contained comprehensive programs that provided information on smoking and its consequences, and had components on decision making skills with resistance/refusal skills training. Results from these high quality studies found smoking prevalence was 8 to 15% lower in the intervention groups compared with controls at 12 months follow-up. Similar trends were also found in the lower quality studies.

Twenty-seven studies targeting tobacco and other substances were included in a second qualitative review.⁶⁵³ The programs were grouped into four types according to content: information/knowledge, affective (decision making, self-esteem), social influences/skills development, and comprehensive (including information, decision making and resistance skills training). The proportions of positive, negative and neutral outcomes were reported for each program type. The social influence programs had 51% positive outcomes, 11% negative and 38% neutral. The comprehensive programs had no negative outcomes and equal proportions of positive and neutral outcomes.

There were five quantitative reviews that presented the findings as pooled effect sizes with change in success rates that could be attributed to the interventions. Bruvold performed a meta-analysis of the California School-based Risk Reduction program using eight studies that had a control or comparison group.⁶⁷⁵ The program was targeted at nine to 14 year olds and, of the studies used in the analysis, six used a rational, didactic approach while the other two studies included life skills training. Results showed the life skills programs were more successful in reducing smoking behaviour post-test than the rational programs.

In another quantitative study by Bruvold, 84 school-based studies (94 programs) were categorised into four types: rational or information giving; developmental, focusing on increasing self-esteem and developing decision making skills; social

norms, with presentation of alternative behaviours; and social reinforcement, teaching recognition of social pressures and developing resistance skills.⁶⁷⁶ Results were presented for post-test and first and second follow-ups; however, no definitions were provided for what first and second follow-up represented. The results found the social reinforcement and social norms programs produced positive results at each point, the effectiveness of the developmental programs was mixed, and the rational programs were not effective.

In the Drug Abuse Resistance Education (DARE) programs developed in the United States, specially trained law enforcement officers teach drug prevention curricula in schools. A meta-analysis of eight DARE programs that had either a control or comparison group found there was a small but significant effect on tobacco use post-intervention.⁶⁷⁷ However, in the two studies that continued to follow participants the effect was not maintained at one and two year follow-ups.

Rooney and Murray performed a meta-analysis of 90 studies of social reinforcement programs targeting smoking prevention, in 11 to 18 year olds, that included control or comparison groups.⁶⁷⁸ Results showed smoking levels could be reduced by approximately 5%. These results were sustainable for up to one year when information on the short-term consequences of smoking was delivered in conjunction with information on the social influences that encourage smoking and training on how to resist the pressures to smoke.

Another meta-analysis was conducted of 90 drug prevention studies (120 programs) targeting 11 to 18 year olds, which all included a control or comparison group.⁶⁶¹ Forty-three of the programs specifically targeted tobacco use and were categorised by content, depending on whether they contained an active component or were non-participatory presentations. When all the studies were included, participatory programs produced significantly better results than non-participatory programs; however, when analyses were restricted to the better quality studies, although a higher effect size was produced by participatory studies it was not significantly greater than that for non-participatory studies.

A recent meta-analysis of 207 international school-based drug prevention programs, including more than half with social influence elements, provided strong support for the efficacy of social influence programming at one year follow-up.⁶⁷⁹

A recent study on the cost-effectiveness of a school-based tobacco use prevention program, using social influences curricula, found the intervention to be highly cost-effective.⁶⁸⁰ However, there are reasons to believe that the integrity and effectiveness of programs may be diminished when attempts are made to translate successful experimental programs into more naturalistic and real world settings.⁶⁸¹ No examples of broad scale successful adaptation outside of experimental trials were identified. Murray *et al.* described one attempt to use legislative and financial incentives to schools to encourage dissemination of programs of known effectiveness in prevention of tobacco use. Over a five year period, no discernible effect was evident.⁶⁸²

Findings from the evaluations and major reviews summarised above demonstrate small but consistent effects for delaying the initiation of smoking, over a one to two year time frame, following well-conducted school drug education. Available evidence suggests that over longer time frames, effects diminish. Despite this general tendency, there is some evidence of reductions in smoking maintained to eight years following the North Karelia program, better outcomes for females seven years after the Western Australian implementation of the Minnesota program, and better outcomes for males 12 years after the Oslo Youth program.

Alcohol

Summary: Evidence for implementation ★

As is the case for tobacco use, there is good evidence that school-based health education programs targeting alcohol use and utilising social learning principles can be successfully implemented with booster sessions in subsequent years. More recent programs have successfully incorporated approaches that include peer leadership, small group discussion, student-led participation, homework tasks and role-plays. Caplan and colleagues noted positive consumer feedback from students regarding their social competence curriculum.⁶⁸³

Maggs and Schulenberg used hierarchical modelling to examine the success of the school-based Alcohol Misuse Prevention Study (AMPS) in altering normative trajectories of alcohol use, misuse, reasons to drink and reasons not to drink across early to middle adolescence.⁶⁸⁴ The AMPS (University of Michigan) involved seven lessons in grade 7 and 8 using role-play to teach specific rather than global strategies to resist pressures to use particular drugs. A randomised pre- and post-experimental control design was used. Longitudinal

data from 971 students, collected across five occasions between 6th and 10th grade, provided 4178 person-time cases. These data were used to evaluate the effects of the program on drinking behaviour, reasons not to drink and reasons to drink. Results indicated that AMPS may alter a young person's trajectory of drug use, but prior drinking experience modified this effect. Among students who engaged in prior unsupervised drinking, exposure to AMPS was associated with a reduced rate of increase in alcohol misuse and a reduced rate of decrease in reasons not to drink across adolescence. This implied an early intervention effect for this program. The authors suggested that a goal for prevention research may be, therefore, not to determine whether a particular program worked but rather for whom the program worked and why. It appeared that reasons to drink increase across adolescence and AMPS seemed to slow down this tendency.

White and Pitts reviewed Project ALERT because it compared the effectiveness of the program on young people who were non-users at the time of the intervention with young people who had already experimented with drugs.^{654, 685} In the short-term, non-users showed more program gains than users. Another study examined the effectiveness of an intervention for young people at different levels of risk, where risk factors included prior use of substances, and found the program was equally effective for all groups.⁵⁹³

In the study by Hansen and Graham, students exposed to the programs where normative beliefs were included significantly decreased alcohol use after one year compared to those in the alternative conditions.⁴⁹⁸ Other reasonably well controlled US studies have also reported small one year impacts in reducing regular alcohol use.⁶⁸⁶

A recent Australian study, the School Health and Alcohol Harm Reduction Project (SHAHRP), has demonstrated main group effects in consumption, harmful/hazardous consumption, and harm associated with young people's own use of alcohol.⁶⁸⁷ This study had a goal of harm minimisation and was an evidence-based classroom program (13 lessons) conducted over two years.¹⁵⁵ Over the period of the study (from baseline to final follow-up 32 months later), students who participated in the SHAHRP program had a 10% greater alcohol-related knowledge, consumed 20% less alcohol, were 19.5% less likely to drink to harmful or hazardous levels, experienced 33% less harm associated with their own use of alcohol, and 10% less harm associated with other people's use of

alcohol, than students who participated in other alcohol education.⁶⁸⁷ These behavioural effects were maintained and/or increased up to one year after the final phase of the program.⁶⁸⁷ The key focus of this program was on the development of utility knowledge and harm reduction skills and strategies. In addition, young people were involved in the development and testing of the program.¹⁵⁵ The SHAHRP classroom-based approach is a relatively cost-effective way of impacting on young people's alcohol-related behaviours.⁶⁸⁷

In summary, compared to the evidence for tobacco use, the short-term impact of secondary school drug education has been less consistently demonstrated for youth alcohol use and there is less evidence for longer-term impacts. The SHAHRP evaluation shows promising early impacts; for AMPS there are effects for selected groups over three years, and for LST there are longer-term effects in reducing regular alcohol use and poly-drug use. When programs run in the context of community mobilisation are included results are less promising. The Midwest Prevention Program was not effective at three year follow-up in reducing regular alcohol use.⁵⁹³ Project Northland showed small effects on use and misuse in mid-secondary school, but these were not maintained through to the end of secondary school.

Cannabis

Summary: Evidence for implementation ★

There appears to be little evidence for the application of specific programs addressing cannabis use alone. However, available evidence does suggest that reductions in cannabis use have been achieved through more generic drug education approaches. Midford, Lenton and Hancock examined a subset of drug education programs that had an impact on cannabis use behaviour and found that those programs that were successful in reducing cannabis use were similarly effective at changing tobacco smoking and drinking. In summary, the most effective education programs for cannabis were found to contain certain essential information about both long-term and short-term consequences of drug use; were small in scale or managed in a way that allowed ownership amongst those involved; had high fidelity of implementation; and were interactively presented. In addition, normative education in the form of feedback from school surveys of peer drug use was helpful because students often overestimated drug use by peers. Additional program components included analysis of the media and other social influences promoting positive attitudes to drugs. Interpersonal skills of

drug refusal, and intrapersonal skills such as decision making, stress reduction and goal setting, were also important components. The other elements, noted above, of booster sessions and inclusion of a family and community component were shown to further increase effectiveness of programs. By contrast, programs that have been largely knowledge-based, delivered by experts, less interactive, and that failed to include family and community components have been less successful. The less successful DARE program, using police officers to deliver education and some life skills to middle school students, is usually used to illustrate this.⁶⁸⁸

Although there has not been extensive research in the studies where cannabis use has been measured, findings have generally suggested that positive impacts may be achievable through drug education. Small reductions in regular cannabis use have been demonstrated three years following the Midwest Prevention Program, and at six and 12 years following the LST program.

Other illicit drug use

Summary: Evidence for implementation ★ ^{1/1}

Follow-up data from the 6.5 year long large-scale, randomised prevention trial of the LST prevention program, delivered during junior secondary school, was reported in 2000.⁶⁶⁶ In this latest study, students were completing secondary school in grade 12. Self-report data collected by mail from 447 individuals showed that those who received life skills training reported less illicit drug use compared to the control group.

8.3.8 Conclusions—school drug education

There is good evidence that drug education programs produce changes in knowledge about drug use and the consequences of drug use for young people who attend school. Although interventions based purely on providing information appear insufficient to change either intention to use drugs or actual drug use, provision of information may be a necessary condition for effective prevention. Drug education programs based on social learning principles have consistently shown short-term effects on both intentions and behaviours. In general, the effects of these interventions diminish and even disappear by late secondary school unless supplemented by additional program input or supplementary strategies. Successful supplementary strategies have included social marketing, community mobilisation, and parental involvement.

Existing evidence suggests that drug education can represent a relatively low-cost method for reducing initiation and escalation of tobacco, alcohol, cannabis and other drug use. Program implementation costs for each class cohort typically include teacher time for around eight to 15 classroom periods in early secondary school, with an additional investment of eight to 15 classroom periods later in secondary school. When properly implemented, this investment can reduce regular tobacco use by 5% to 10%.

The systematic review by White and Pitts showed that effect sizes for most programs that were effective were small, with 3.7% of young people who would have used drugs delaying onset of use or persuaded to never use.⁶⁵⁴ Evaluations must be continued in the long-term to see if this delay in regular use or progression to further use continues. To shed some perspective, the authors note that pharmaceutical trials are stopped once effect sizes smaller than this are reached, on the basis that effectiveness is too high to ethically allow the non-treatment arm not to have access to treatment (example, aspirin trials in myocardial infarction). It is also true that effect sizes measured may underestimate the potential gains, as authors seldom report on fidelity of implementation or on numbers of participants who received the entire program as opposed to parts.

In a study of the ALERT and LST drug education programs in the US, the RAND Institute found that these programs reduced drug consumption (cocaine) by around 35% (25% of that came from reduced initiation of use and 10% from reduced consumption). The cost per participant was estimated at around US\$67 or 1.5% of national drug control spending. This report found that for every dollar of resource used by the program, \$2.4 would be averted in social costs. However, it was recognised that considerable uncertainty surrounded this estimate.⁶⁸⁹

Because there is still much to be integrated regarding drug education, implementation can be difficult. Kim and colleagues report a failed attempt to disseminate health education in North Carolina.⁶⁹⁰ In this case, few students could recall receiving the program, providing some indication that failed implementation may have explained the absence of effects.

There are some warning signs that the dissemination of effective drug education in the Australian context will not be a simple matter. Perry and colleagues evaluated the effectiveness of drug education in different nations as part of a WHO

trial.⁶⁹¹ Evidence from this study demonstrated effectiveness for drug education in many nations including the US; however, an Australian implementation was not effective. It is clear that in attempting to implement evaluated programs further evaluation will be required to ensure successful adaptation to the Australian context.

Given there are considerable risks through the implementation of drug education programs, it is important that investment in these programs be accompanied with a proportionate investment in evaluation. Because of the difficulties involved, it is reasonable that 20% of the program budget and resource requirements committed for drug education should be directed at evaluation. Evaluation designs should include behavioural follow-up, and randomisation to test new program elements against control groups, such as the evaluations of drug education programs in Western Australia which are being conducted through the National Drug Research Institute.

8.4 School organisation and behaviour management

Definition: Programs run in primary schools to better prepare children for the transition to secondary school encourage positive interpersonal relationships at school, ensure effective discipline, maximise learning opportunities and maintain drug-free environments.

Although there is a growing body of US research to suggest that interventions aimed at improving primary school social environments can have positive impacts, there has been less research examining secondary schools. The available research is limited and inconclusive but does suggest that secondary school organisation and behaviour management practices may influence youth drug use. Further research is required to develop a wider range of program options and to better establish the intervention processes that underlie program effectiveness.

One element of school organisation that appears of particular importance for preventing antisocial behaviour is the policies and practices relevant to bullying and aggression within the school. Olweus's evaluation of a multi-component anti-bullying program in Sweden presented evidence of significant reductions in violent and delinquent behaviour.⁶⁹²

The Victorian Gatehouse Project provides an interesting example of an intervention attempting to modify early secondary school environments to

promote mental health.⁶⁹³ The Gatehouse approach aims to increase school bonding and to reduce experiences of victimisation. A potentially important component of the Gatehouse project has involved the incorporation into the standard curriculum of components aimed at teaching stress-coping skills. Given the program focus on improving social connections and enhancing life skills, it is plausible that risk factors for youth substance abuse may be reduced. A rigorous evaluation of the Gatehouse strategy utilising random assignment of schools is proceeding.⁶⁹³ Early indications have associated the program with reductions in youth drug use but these analyses have not yet been published.

A very different intervention strategy to that developed in the Gatehouse program involved selecting students at risk and offering them special services within schools. Eggert and colleagues evaluated a selective intervention for late secondary school students at high risk of drop-out.⁶⁹⁴ Staff identified students who were offered placement in 'personal growth classes'. The personal growth classes offered group support, friendship development, and school bonding through small teacher-student ratios and an emphasis on positive peer relations. A specific skills training course was also offered based on four units: self-esteem enhancement, decision making, personal control, and interpersonal communication. Findings demonstrated that those exposed to the groups reported improvements in school bonding, self-esteem and reductions in deviant peer associations. Program participants demonstrated less entry to harmful drug use. Program participation was voluntary and the evaluation was small and weakly controlled, hence more rigorously controlled evaluation of this program is warranted.

An interesting exploratory study points to a potential future direction for assisting students who have a high number of risk factors for harmful drug use. Hastie and Sharpe described a quasi-experimental intervention on a small (n = 20), non-randomly selected sample of male students in grades 7 and 8 in a rural school located in an economically depressed part of Canada.⁶⁹⁵ More than one-third of the cohort from which these boys were taken was achieving school grades below a D level. According to the school principal, most were at-risk for school failure and early drop-out. Hastie and Sharpe describe a 20 lesson unit of modified football, with rules configured in such a way as to promote the likelihood of interpersonal conflict. The lesson content was described and seven types of behaviour identified and operationally defined (e.g. leadership, compliance, positive peer interactions).

Students were divided into four teams and feedback was provided before each match about performance at the previous match with respect to the target behaviours. Teams also competed for a 'Fair Play' award. Outcome variables included teachers' ratings of videotaped behaviours and student questionnaire data. The authors reported improvement in positive interpersonal comments, leadership, and positive peer support. There were strong correlations between students' post-match questionnaires and the raters' scores on the videotapes. This study was based on a small convenience sample and little statistical inference was used to compare pre- and post-measures. This type of approach does warrant consideration as a means of developing social skills and positive school connections for students in secondary school who may have a high risk for drug use problems.

There are innovative efforts to improve school learning outcomes in Australian secondary schools that are likely to address developmental risk and protective factors that relate to harmful drug use, for example, the Advocacy program that has been developed and trialled in Victorian secondary schools. The program emphasises the development of an ongoing one-to-one relationship between a teacher (the advocate) and a student. Teachers volunteer to be advocates and undertake professional development. They meet with students individually at least once every two weeks for at least 20 minutes. During this time, they focus mainly on helping students manage their learning. The essence of the interaction is that the advocates are caring adults who listen to the students and support them to develop an individual approach to learning, based around their strengths.

8.4.1 Tobacco, alcohol, cannabis and other illicit drug use

Summary: Warrants further research [↗](#) ^{1/1}

Evaluations presented in earlier sections revealed that, by altering primary school environments, longer-term improvements in youth development appeared to be achievable. There has been less research investigating the potential to improve social environments within secondary schools; however, current indications suggest such approaches may be feasible. The impact of such programs on youth drug use is currently unknown but should be investigated.

8.4.2 Conclusions—school organisation and behaviour management

In recent years, several strategies relevant to school organisation and behaviour management have emerged as having potential in secondary school settings. The Victorian Gatehouse project provides an excellent model for improving secondary school social environments and is now being supported for wider dissemination. Very promising evaluation findings are being reported in the overseas literature for school organisation programs delivered in the primary school setting. Investment in this type of approach for delivery in the secondary school setting would appear warranted.

8.5 Peer intervention and peer education

Definition: Youth peers of common identity provide support or deliver a health message.

Peer influence is an important factor in the development of youth drug use and, therefore, it would appear logical to attempt to use peer influence to reduce youth drug use. Peer leadership in drug education has been evaluated. Generally, peer-led elements are incorporated as one component in a broader set of activities, making it difficult to identify the specific contribution of the peer intervention. There are some risks with peer interventions that need to be acknowledged. Poorly implemented peer interventions have the potential to increase affiliations between youth with a high number of risk factors, reinforcing attitudes and behaviours favourable to drug use.

Use of peer leaders as a strategy for reducing drug use in the context of school drug education has been reviewed by Midford, Lenton and Handcock and was summarised above.⁶⁵⁰

Tobacco

Summary: Warrants further research [↗](#) ^{-1, +2 /6}

Although it is difficult to clearly assess the importance of the peer component, the available research suggests that evidence of reduced smoking initiation has been associated with exposure to peer programs in school drug education. However, in some evaluations impacts were not achieved and there is, as yet, limited evidence to demonstrate that longer-term outcomes can be assured through these programs. Furthermore, there is some evidence from the study conducted by Dishion and colleagues that poorly conducted peer interventions can exacerbate tobacco use and related problems.⁶³⁶

Wiist and Snider described an innovative approach to health education in schools.⁶⁹⁶ The project KNOW incorporated the elements of assertive refusal, role-play, analysis of the media etc. Student teachers, peer leaders chosen on the basis of sociometric analysis, and model students were compared as program leaders. Non-smoking rates in the program run by peer leaders were higher (55%) than in the model student (42%), student teacher (41%) and comparison groups (48%) though these differences were not statistically significant. These results suggest that the peer leader program could influence behaviour change but a larger evaluation will be required to establish this.

A pilot study to evaluate the effect of a peer developed, smoking prevention program was conducted in Athens, Greece.⁶⁹⁷ The intervention group comprised 237 students in the first two grades of secondary school; they were compared to a control group of 90 students from another school. The outcomes were based on self-report and included smoking behaviour, intent to smoke, knowledge and attitudes toward smoking. A randomly selected group of 37 students from the intervention school developed anti-smoking audiovisual material that they then presented to the whole group. At the one year follow-up, exposure to the intervention had attenuated the overall tendency for increasing experimentation with cigarettes such that the increase was lower in the intervention group. However, the intervention had no effect on intent to smoke in the future, attitudes toward smoking, and knowledge about the health hazards of smoking and its addictive nature.

There is evidence to suggest that teaching skills to resist peer influence may be important intervention components in drug education programs. A randomised controlled trial was conducted in the Netherlands to assess the effects of different peer-led social influence programs, with and without boosters.⁶⁹⁸ Fifty-two schools from 15 district health centres were randomly assigned to a social influence intervention, a social influence intervention with a decision making component, or the control condition. Half of the treatment schools were randomly assigned to receive boosters that consisted of three magazines containing pertinent information on all aspects of smoking, interviews with non-smoking celebrities and a competition. The social influence intervention was five lessons lasting 45 minutes each and delivered in weekly sessions by peer leaders. The decision making component was the introduction of a manual in the first lesson outlining five steps to making a decision: identifying a situation in which you have to make a

decision, looking at possible alternatives, weighing alternatives, making a decision, and implementing the decision. The interventions were implemented in grades 8 and 9. Smoking prevalence was determined via questionnaire prior to the intervention programs being initiated and then every six months up until 18 months later. The first booster was delivered between the six and 12 month follow-ups and the second and third boosters were delivered between the 12 and 18 month follow-ups. In the short-term (6 months), both interventions were effective in reducing the onset of smoking; however, at the 18 month follow-up, only the peer-led social influence program with boosters remained effective.

A study was completed in Wales that included two intervention and two control schools, recruited in Mid Glamorgan.⁶⁹⁹ The intervention and control schools were matched on size and sociodemographic mix. Popular students in years 8 and 9, aged between 12 and 14 years, were recruited in the intervention schools for intensive training by specialist staff to promote smoking cessation and to prevent smoking initiation among their peers. Self-reported smoking status was collected via questionnaires at baseline, immediately post-intervention and three months later. Students were also asked to provide saliva samples for analysis of cotinine levels to validate reported smoking status. With the exception of self-reported smokers, all saliva samples were tested at baseline. Only saliva samples collected from students who reported a reduction or cessation of smoking were tested at the second and third data collection points. Baseline prevention of ever having tried smoking was significantly higher in the intervention schools; therefore, changes in smoking behaviour were compared rather than actual smoking behaviour. The intervention showed no overall effect in reducing smoking initiation among non-smokers or increasing smoking cessation among regular smokers. However, pupils in the intervention schools who reported being ex-smokers at baseline were significantly less likely to have resumed smoking than ex-smokers in the control schools.

A recent study was conducted in three secondary schools in Athens, Greece, which had a similar design to the study conducted in Wales.⁷⁰⁰ Two schools were assigned to receive a peer-led intervention and one was used as a control. In the intervention schools, working groups were established to develop audiovisual material, in the form of a videotape and drawings, with an anti-smoking message. The members of the working groups had eight weeks of training from senior

child mental health professionals: on group dynamics, enhancement of student self-esteem and social skills, and group activities for health education. These students then became peer leaders who presented the videotapes and pictures to each class. The article stated that the students had a mean age of 13 years and four months but no age range was given. Assessment of knowledge, attitudes and behaviours around smoking were compared pre-intervention, immediately after the start of the intervention and three months later. Those in the intervention groups reported a decline in smoking behaviour and intention to smoke immediately after the intervention but this was not sustained at the three month follow-up.

There are 'self-evident' peer strategies that have a track record of exacerbating youth problems. In the small study by Dishion and colleagues, the results suggested that interventions that increase contact between high-risk youth are at risk of being counter-productive for preventing tobacco use.⁶³⁶ The findings reported above suggest that peer-led drug education can be implemented and with appropriate training and support that behaviour can be impacted. The research over the past decade is mostly based on small samples and shows that many interventions were unable to sustain longer-term behavioural changes. Study designs also need to focus on testing a wider range of the peer processes that might lead to behaviour change. For example, is it positive peer interaction or changes in perceived peer norms that are more critical? Interpretation of the research findings over the past decade should be considered in conjunction with earlier research summarised by Tobler,⁷⁰¹ which suggests the effectiveness of youth substance use prevention programs can be improved by peer-led intervention. One way forward is indicated by the Netherlands study reported above.⁶⁹⁸ The finding of superior impacts for the combination of peer leadership and booster sessions in subsequent years echoes the results of Botvin's drug education work, reported earlier.⁶⁶⁴ Peer programs hold some promise for tobacco control, hence further investment in evaluation research is recommended.

Alcohol and cannabis use

Summary: Warrants further research  0/1

When evaluating two forms of an alcohol education program involving peer leaders and teachers, Wilhelmsen *et al.* found a more highly structured program significantly decreased alcohol use, while a less structured program was associated with increases in alcohol use similar to those in the control condition.⁷⁰² The implication of this

evaluation was that teachers need to be closely involved in programs that incorporate peer leaders.

Given the evidence of negative effects for poorly implemented peer programs, investment is not warranted unless it is accompanied by evaluation to enable outcomes and impacts to be accurately measured. Evaluation should examine the short-term impact of peer education on risk factors such as attitudes to drug use. Where short-term impacts appear congruent with risk reduction, longer-term outcomes should be examined. The Victorian Government has made some investment in the development and implementation of peer-education programs to address alcohol and illicit drug use. Controlled behavioural evaluation of these programs is vital.

Illicit drug use

Summary: Warrants further research  0/0

Peer programs have been extensively used in Australia to address risks associated with illicit drug use. Typically these programs have involved strategies such as encouraging safe injecting and providing information regarding support options. The impact of these programs on illicit drug use is not yet known. This would appear to be a valuable area for further research.

8.6 Youth sport and recreation programs

Definition: Provision or utilisation of recreational opportunities outside the school setting to promote the positive development of children and young people.

For many young people, involvement in drug use is considered to be 'recreational' to the extent that it is a component of social and non-school recreational activities. Efforts to reduce drug use have included efforts to modify youth recreation settings.

Tobacco

Summary: Warrants further research.  0/1

Participation in health clubs has been a popular approach to smoking prevention in the UK. Typically, membership is for younger adolescents who are non-smokers. Activities of the clubs vary but include recreational outings, newsletters, competitions and retail discounts. The clubs have been popular in attracting membership and the 'Grampian Smokebusters' has been the subject of more detailed evaluation.⁷⁰³ Participation in the Grampian Smokebusters was very high, with the

club successful in attracting over half the eligible members in the community and over 97% having heard of it. Surveys were conducted over a four year period to evaluate the effect of the program. The program produced no discernible effect on smoking rates at the end of four years.⁷⁰³ The authors commented that the program was set within a community where many other influences came to bear on the likelihood of young people smoking. In this context, a single approach of this kind appeared unlikely to be effective.

Other initiatives, such as the use of local magazines targeting teenagers and the use of other youth clubs as settings for health promotion, have not been the subject of rigorous evaluation.

Alcohol

Summary: Warrants further research.  ^{0/0}

With sport being an activity that is intrinsically attractive to many teenagers, involvement in it has potential as a vehicle by which a range of positive social behaviours can be modelled and reinforced. In Australia, however, there is a close and long-standing nexus between many male-dominated sports (e.g. football, rugby, cricket) and excessive levels of alcohol consumption. Recent research conducted by the Australian Drug Foundation suggests that young male players account for the bulk of the excessive alcohol consumption that takes place in amateur football club settings.⁷⁰⁴ Whilst local sporting clubs are widely regarded as important community assets, because of the connectedness they offer across a wide social spectrum, unhealthy practices with respect to alcohol management give cause for concern. For this reason, the Australian Drug Foundation has recently introduced its Good Sports Accreditation Program (GSAP) as a means by which clubs can be recognised at a community level for their engagement in alcohol policy and practice initiatives. An intrinsic component of the GSAP is the systematic involvement of community partners, such as local police, community health centres and regional sports assemblies, so that community ownership and awareness of the program is cultivated. While it is too early to demonstrate impact of the GSAP on at-risk young peoples' alcohol and other drug use, this settings-based approach, with a strong emphasis on links between policy and practice, holds promise as a means by which a long established cultural norm may be modified over the long-term.

Cannabis and other illicit drug use

Summary: Warrants further research.  ^{0/0}

There does seem to be some evidence that involving at-risk young people in organised community-based activity programs, such as youth clubs, confers some protection against drug misuse at both an individual and a settings level. Schinke *et al.* carried out a pre- and post-test controlled evaluation of different boys' and girls' club settings and found that the presence of crack cocaine was lowest in settings that were enhanced by a drug abuse prevention program.⁷⁰⁵ Compared to settings where no such clubs existed, parental involvement in the lives of young people was greater in settings where clubs existed, but not necessarily greater in settings that were enhanced by the drug abuse prevention program. A similar pattern emerged with respect to vandalism rates, which were highest in settings without clubs but lowest in settings with standard club programs (i.e. not enhanced by a specific drug abuse program). This raises the possibility that clubs confer protective factors by virtue of their promotion and modelling of positive social behaviour but may not be successful as quasi-educational avenues with respect to drug use. There were some significant methodological limitations on this study (e.g. limited statistical analysis of group differences, limited follow-up time frame); however, this approach seems to warrant further investigation.

There have been some efforts in Victoria to organise opportunities for drug treatment clients to be involved in football competitions. The effect of these interventions on drug use has not been evaluated.

8.6.1 Conclusions and recommendations—youth sport and recreation

The above review demonstrates the initiation of evaluation studies investigating impacts through youth sport and recreation programs. None of the studies conducted to date have strong enough evaluation designs to conclude the programs had positive impacts. The evidence does suggest the strategy has promise and hence warrants further evaluation. Investment may be particularly warranted to further disseminate the Good Sports Accreditation Program in the context of evaluation for longer-term effectiveness in reducing harmful alcohol use. Youth sport and recreation strategies may be of particular importance to young people who are not attending school.

8.7 Mentorship

Definition: Strategies to develop positive social relationships between youth and adults who can provide support and healthy role modelling.

Youth connectedness with caring and responsible adults has been shown to reduce the risk of drug use and related problems for youth with a high number of risk factors. Programs that recruit and then train adult volunteers to offer advice and friendship to young people have been implemented and, in some cases, evaluated.

Mentoring programs typically involve non-professional volunteers spending time with individual youth in a supportive, non-judgemental manner while acting as role models. Tierney and colleagues evaluated the Big Brothers/Big Sisters program.⁷⁰⁶ In a well-controlled evaluation, significantly less early age drug use was observed amongst youth exposed to mentorship compared to youth randomly assigned to a waiting list control group. Exposure to mentoring also demonstrated a range of positive impacts on risk and protective factors relevant to early intervention, including improved academic performance and family attachment.

Tobacco and alcohol use

Summary: Limited investigation ○

As currently designed, mentoring programs focus on youth with a high number of risk factors, and hence their use for more universal applications to prevent youth alcohol and tobacco use does not appear warranted. It is conceivable that there may be future applications of these programs in targeting youth with specific vulnerabilities to alcohol problems.

Cannabis and other illicit drug use

Summary: Warrants further research ^{0/0}

The use of mentorship appears promising as a selective intervention for youth who may have a high number of risk factors for illicit drug use problems.

8.7.1 Conclusions—mentorship

The Big Brothers/Big Sisters program has been implemented in Australia through Jesuit Social Services and appears worthy of further evaluation. Mentoring programs could be supported for further evaluation directed at innovations to broaden the range of models, and for the establishment of longer-term outcomes within a randomised

controlled trial design. Mentoring programs may be particularly successful where they are conducted in institutional environments, such as schools, and where there are high rates of drug-related harm such as in Indigenous communities and among out-of-school youth.

8.8 Community-based drug education

Definition: Adolescent health education curricula or information delivered in a community setting other than in schools.

Based on experience to date, there may be opportunities to deliver drug education curricula to youth in a range of community settings. The existing evidence suggests that investment in this direction should be approached cautiously. As with all types of drug education, community-based programs have the potential to exacerbate problems.

Tobacco

Summary: Limited investigation ○

We are aware that community-based health education, including circulation of QUIT smoking information, has been a popular approach for tobacco control in Australia. However, there were no studies identified evaluating this approach to tobacco control. The effectiveness of this approach as a stand-alone strategy remains questionable. Rigorous evaluation is required to establish conditions whereby this strategy might be effectively utilised.

Alcohol

Summary: Limited investigation ○

Various programs have been run in community settings to address problems associated with alcohol use, for example, alcohol education programs run in drug treatment programs and at community centres. Such programs may target youth with drink-driving offences or entering drug treatment for alcohol related problems. We have been unable to locate evaluation studies assessing the impact of these programs in reducing problems associated with youth alcohol use.

Cannabis and other illicit drug use

Summary: Warrants further research ^{-1, +1/2}

Warning: Negative results in ^{1/2} studies

Sequenced drug education programs, including social learning approaches and drug information, have been developed and evaluated targeting youth

with a high number of risk factors for illicit drug use. In overview, these programs appear feasible to implement; however, there may be risks in aggregating high-risk youth in selected drug education programs.

Fors and Jarvis used a quasi-experimental design to evaluate a community education strategy delivered to a selected population of runaway/homeless youth.⁷⁰⁷ A four session curriculum was delivered alternately by peers and adults. Evaluation suggested that from pre- to post-test, those exposed to peer-led instruction were the only ones to show a significant difference relating to drug knowledge taught through the curriculum, and increased likelihood of assisting friends to use community facilities. These findings must be cautiously interpreted as the analysis did not adequately control for pre-program differences or compare effects across conditions.

Palinkas and colleagues reported a selective intervention targeting females, aged 14 to 19 years, who were pregnant or parenting and screened to be at risk of drug use.⁷⁰⁸ Recruitment mostly occurred through community health clinics. This report examined a 16 week curriculum focusing on social and life skills. The intervention demonstrated no benefit for social skills training and in some cases, three month follow-up outcomes were worse. Post-hoc analyses suggested the skills group increased their level of socialisation with delinquent and/or drug using peers. It may be that improving global social skills in the context of prevalent drug use may not be a useful prevention strategy.

8.8.1 Conclusions—community-based drug education

Although drug education curricula are being delivered to youth in a range of community settings, there has been little evaluation. The existing evidence suggests that investment in this direction should not be further pursued unless it includes adequate evaluation. As with all types of drug education, community-based programs have the potential to exacerbate problems by increasing affiliation with youth who have a high number of risk factors.

8.9 Preventive case management

Definition: Coordinated delivery of more intensive services tailored to meet a range of developmental needs; generally targeted to children and adolescents with multiple risk factors.

This strategy attempts to assist youth with a high number of risk factors and typically involves complex coordination across a range of service types. Efforts to assess needs, identify relevant services, coordinate service delivery and monitor outcomes are important ingredients within a case management model. Although various models appear to be utilised in health, counselling, youth work and welfare, there has been less emphasis on evaluation. In what follows, a range of evidence-based models that appear relevant to early intervention are discussed but it should be noted this review is selective and ignores a vast practice oriented literature.

Tobacco, alcohol and cannabis

Summary: Limited investigation O

There have been no studies evaluating the impact of preventive case management on tobacco or alcohol use. Preventive case management approaches appear better suited for targeting youth with a high number of risk factors and hence may be of limited use in more universal applications.

Illicit drug use

Summary: Warrants further research [2]^{1/1}

The Multisystemic Treatment (MST) program was described earlier in this report (see Targeted Family Intervention). The MST program emphasises the development of service delivery objectives in consultation with the young person and, where possible, their family. Service selection emphasises evidence-based interventions and the use of monitoring to ensure progress toward agreed treatment goals. MST service purchasing is managed by senior clinicians who are paid incentive payments based on achievement of agreed treatment outcomes.⁶⁴⁹ Current evidence suggests that the MST model has achieved behavioural improvements for mandated juvenile justice clients in the US above previous best practice. As clients entering juvenile justice have a high likelihood of escalating to serious drug abuse, this preventive case management model is considered relevant as a targeted intervention.

The Children at Risk (CAR) program targets high-risk youth in lower socioeconomic areas where there is significant poverty and antisocial activity.⁷⁰⁹ It involves collaboration between government and other services dealing with juvenile justice, drug abuse and community health. It aims to involve neighbourhood youths in services that offer attractive alternatives to drug abuse, gangs and criminal behaviour. CAR programs require intensive

case management; coordinating family intervention, after-school activity, mentoring, tutoring, individual psychiatric assessment and counselling. Evaluation of this approach has not yet been reported.

The Action Research Intervention and System Improvement Team (ARISIT) is a preventive case management approach that has emerged in regional Victoria.⁷¹⁰ The ARISIT is a joint initiative involving partners in education and human services and involves a case management model using collaborative strategies across service sectors. Cross-sectoral training in the model is provided for school and youth and community services staff in the region. Service delivery is then monitored using an action research approach that is directed by the goal of reducing developmental risk factors and enhancing protective factors. The support of ARISIT at a regional level enables information on service impacts to be used for planning future service development. The ARISIT includes training materials and manuals but to date there has been no evaluation examining outcomes.

8.9.1 Conclusions—preventive case management

Preventive case management appears to be a feasible approach for assisting youth with a high number of developmental risk factors although there have been no evaluations assessing impacts on harmful drug use. Variants of this strategy are being developed for delivery in Australian settings and investment to assist further implementation and evaluation would appear warranted.

8.10 Community mobilisation

Definition: Campaigns to initiate or strengthen an explicit strategy of coordinated community action aiming to advance healthy youth development and prevent harmful drug use.

The costs and resources required to implement multi-level community-based interventions are considerable; however, they provide the opportunity to target a range of risk and protective factors influencing youth drug use. Evidence supporting the benefits of targeting a range of risk and protective factors at the same time is accumulating, and efforts to implement and evaluate ambitious community prevention and intervention activities are now being reported.

In earlier sections of this chapter, the community mobilisation activities within the Midwest

Prevention Program and Project Northland were mentioned. These programs are important because of the apparent success they have achieved in implementing complex community interventions. Project Northland found some early indication that community-level intervention programs can influence positively a range of risk and protective factors and also behavioural outcomes.⁵⁷⁹ The onset of alcohol use was successfully delayed in the intervention school districts both in year 7 and year 8. Significant reductions in the onset of tobacco and cannabis use were observed for students who were non-users of alcohol at baseline. The Midwest Prevention Program reported results for one year and three year follow-up. At one year, this program demonstrated positive impacts on mediating factors (attitudes, knowledge, skills and peer influence) and on initiation and escalation in use of tobacco, alcohol and marijuana use.⁵⁸⁰ The three year follow-up demonstrated the program was effective at preventing escalation (recent use in 30 days) in tobacco and cannabis use, but not for alcohol.⁵⁹³ Further details of these earlier studies are summarised elsewhere.¹⁴

To determine whether the intervention reduced drug use among high-risk individuals, data from the Midwest Prevention Program for students who were using tobacco, alcohol or cannabis at baseline were analysed separately.⁶³¹ These results showed that at six months, the baseline users in the intervention arm of the program had significantly decreased their use of all three substances compared with the controls. Although statistically significant effects were not sustainable over longer periods, the intervention program consistently demonstrated a tendency to reduce the use of tobacco, alcohol and cannabis among baseline users across all four follow-ups, except cannabis use at 42 months. Despite the data on drug use in this study being based on self-report, this research indicated community-based intervention programs may impact not only on non-users at baseline but also those who have started to use drugs. Community-based intervention has the advantage of being able to reach the unidentified high-risk population of early drug users in an anonymous fashion and at an early stage when their patterns of drug use may be more easily influenced.

A Centre for Substance Abuse Prevention Community Partnership Project was established in Santa Barbara County, California, in 1991. The California drug use survey was administered, at initiation and at completion of the project (in 1995), to students in grades 7, 9 and 11 to examine change in drug use patterns.⁷¹¹ Valid responses were

only received from 46% of students so some caution is required when interpreting the results. Drug use rates increased over the four year period in which the study was conducted, but to interpret these increases, the rates were compared with the rest of California. Students in Santa Barbara reported less frequent recent use of all the drug types examined, with the exception of cannabis use, in grade 7 and poly-drug use across all ages. Significantly, more students in Santa Barbara reported no use of alcohol or other drugs in the six months prior to the survey compared with other Californian students. However, poly-drug use, defined as the use of any two substances 'on the same occasion' in the six months prior to the survey, was more than twice as likely to be reported by grade 7 students in Santa Barbara (17.1%) than grade 7 students from the rest of California (8.1%). In grades 9 and 11, the percent of students reporting poly-drug use was higher in Santa Barbara, but only by 4% and 3.6% respectively. Most students reported that the program had an effect on them and did not increase their interest in substance use.

A community mobilisation program targeting adolescents on American Indian reservations through a variety of activities, including festivals and parent training, found that youth exposed to the intervention showed a decline in alcohol and cannabis use.⁷¹² However, similar falls were also observed in control communities, making it difficult to attribute changes to the intervention.

In a separate study, a culturally sensitive skills- and community-based approach aimed at preventing substance abuse among American Indian youth was developed and tested in five States of America.⁷¹³ A conventional theoretical model of life skills was tailored to the cultural prerogatives and everyday realities of American Indian young people living in the target western reservation setting. Students from 3rd, 4th and 5th grade in 27 tribal and public schools in North and South Dakota, Idaho, Montana and Oklahoma were surveyed on their use of tobacco, alcohol and cannabis. Youths were divided randomly by schools into three arms: skills training alone, skills training plus a community involvement component, or a control arm which did not receive any intervention. The skills training involved a 50 minute session each week for 15 weeks that covered instruction, modelling and rehearsal in cognitive-behavioural skills associated with drug abuse prevention. The community involvement component of the other intervention arm included mobilisation of the youths' families, teachers, school guidance counsellors, neighbours, law

enforcement officials and commercial establishments to support drug abuse prevention. Flyers and posters were distributed to businesses, health and social service agencies, schools and churches, and information meetings were held for parents, neighbours and teachers about the skills training the youths were receiving. Semi-annually, youths in the intervention arms received booster sessions. Six months after the interventions and every year for the following three years, all youths were retested with the baseline assessment tool.

Drug use in the last week was used as the outcome measure. Tobacco smoking was defined as seven or more cigarettes in the last week, and alcohol and cannabis use was defined as four or more instances of use. In general the skills-based intervention proved to be more successful than the skills plus community-based intervention. At the six and 18 month follow-ups, there were no differences seen in the use of tobacco, alcohol or cannabis in the three study arms. No impact was seen on tobacco use in any further follow-ups but the use of smokeless tobacco was reduced in the skills only groups compared with the skills plus community or control arms. At the 42 month follow-up, the skills only group consumed less alcohol and used less cannabis than the control group, but the skills plus community group had intermediary rates that did not significantly differ from either the control or skills only groups. Hence, in this case, the findings did not indicate an advantage for the supplementation of school drug education curricula with community mobilisation activities.

Studies within the American Indian communities suggest that caution is required when attempting to culturally tailor established intervention programs and that conceptual work may be necessary to develop new prevention approaches for different cultural groups.

Tobacco

Summary: Evidence for implementation ★ ^{5/13}

Definitive evidence is lacking but, on balance, the current evidence provides some indication that there may be benefits in supplementing school-based drug education with additional community mobilisation components.

A systematic review of community interventions for preventing smoking in young people was published by The Cochrane Collaboration, in 2001.⁷¹⁴ Both randomised and non-randomised controlled trials were included that assessed the effectiveness of multi-component community interventions compared with single component or school-based

programs or control conditions and reported on smoking behaviour in persons less than 25 years of age. As is customary for Cochrane reviews, both published and unpublished data were sought. A study by Biglan and colleagues was the only one that was unpublished at the time of the review and it has subsequently appeared in press. The review considered 57 studies and rejected 44 that did not meet the inclusion criteria.

Of the 13 studies that were included, four had randomised either schools or communities to the intervention and control conditions. One study compared a community intervention with a school-based intervention only group and a no intervention control group. The interventions assessed were diverse and the populations to which they were applied varied from small rural communities to communities within large cities. Interventions ranged in length from three weeks to six years and outcomes were measured immediately post-intervention in five of the studies, while in the other eight studies, length of follow-up varied anywhere from six months to 15 years. Attrition rates from the studies also varied considerably, ranging from 0% to 45%. Most of the interventions were directed at students in late primary or early secondary school, with five studies targeting students from 11 years of age, three from 12 years of age and two from 14 years of age. Only one study reported younger children being involved in the intervention and that was the Smokebusters program in the UK, which was directed at eight to 15 year olds.

Lower rates of smoking were reported in the intervention condition in two of the nine studies that compared intervention communities with no intervention control communities.^{600, 716–723} A difference in smoking prevalence was reported in one of three studies that compared multi-component interventions with school-based programs only.^{715, 716, 721, 724} One study reported significantly lower prevalence of smoking in a group receiving a multi-component approach, which consisted of a combination of media, school and homework interventions, compared with a group that had the media intervention only.⁷²⁵ Another study comparing a multi-component community intervention with a mass media intervention alone found the former had a lower rate of increase in smoking prevalence.⁷²⁶

It is important to note that not all evaluations of community mobilisation programs have reported positive impacts on youth tobacco use. In an evaluation of a heart-health community

mobilisation campaign in Rotherham, in the UK, Baxter and colleagues reported higher smoking rates amongst students exposed to the programs compared to control communities.⁷¹⁶ The costs of community mobilisation programs are considerable and they would need to guarantee superior results compared with well-implemented school-based health education alone before this approach could be recommended for wide-scale dissemination.

Existing research has helped to establish the components of community mobilisation programs that will be required to address youth tobacco use. It is recommended that future investment be directed at evaluation to further explore the behavioural impact of these programs.

Alcohol

Summary: Evidence for outcome effectiveness ★★

Evidence from three well-conducted evaluations suggests that modest reductions in youth alcohol use can be achieved through community mobilisation. Initiation to alcohol use was delayed in Project Northland, and in the Midwest Prevention Program, Project Northland and the New Hampshire Program the studies appear to have been well implemented, carefully evaluated and all have positive outcomes relevant to early intervention. Although there have been important successes, translating these promising findings into assured programs is not in all cases successful. The studies within the Native American communities suggest that caution is required when attempting to culturally tailor established intervention programs and that conceptual work may be necessary to develop new prevention approaches for different cultural groups. Evidence summarised in Chapter 10 also demonstrates that community mobilisation programs have been more broadly successful in changing community factors that impact alcohol use amongst young people. For example, the Community Trials Project conducted by Holder and colleagues successfully reduced minors' ability to purchase alcohol, underage drinking, and harms associated with alcohol.⁷²⁷ Although reductions in alcohol use have been documented through community mobilisation, the available evidence suggests that further evaluation should investigate whether outcomes are superior compared to simpler interventions that are limited, for example, to a single component such as school-based drug education or enforcement of laws relating to youth and alcohol use.

Cannabis

Summary: Evidence for implementation ★ ^{3/3}

In 1987, a longitudinal study of substance abuse prevention in a rural cohort of pre-adolescents and adolescents was begun in New Hampshire, in the US.⁷²⁸ One hypothesis was that preventing cannabis use required a community as well as a curriculum intervention, to establish a threshold of societal disapproval. This study had two intervention groups and one control group, and a very high response rate of over 80%. One intervention group received an anti-drug program as part of the school curriculum. The other intervention group received community intervention in addition to the school-based curriculum through parent courses and a community task force. Data from this study were used in proportional hazards models to identify factors that were associated with trying cannabis and, separately, with regularly using cannabis.⁵⁹⁰ After adjusting results for age and gender, they found no differences between the three study groups in the proportion of children who tried cannabis. After adjustment for both demographic and psychosocial variables, children in the community intervention were at reduced risk for regularly smoking cannabis compared with the control group, while the control and curriculum only groups did not differ. The authors concluded that the community prevention approach did not deter children from trying cannabis but did appear to be successful in preventing them from becoming regular users.

Project Northland⁵⁷⁹ and the Midwest Prevention Program also had some impact in reducing some patterns of cannabis use.⁶³¹

Other illicit drug use

Summary: Warrants further research 📖 ^{0/0}

Beginning with the Turning the Tide initiative in the mid 1990s, in Victoria, many Australian States have implemented community wide programs aimed at better coordinating community responses addressing illicit drug use. These programs included a range of elements, and community mobilisation components have been included in some. Common features include efforts to bring together community members for consultations and discussions culminating in efforts to establish agreed local strategies. In many cases, these activities have resulted in positive service development and, in some cases, better resource coordination. However, we have been unable to locate evaluations that enable the effect of these programs on illicit drug use to be assessed. More

systematic evaluation of these programs, including randomised controlled community trials, would appear warranted.

8.10.1 Summary of evidence for community mobilisation interventions

Community mobilisation requires considerable coordination but available evidence suggests the strategy can be carried out. Although the balance of recent evidence appears favourable, further research will be required to better establish the conditions whereby community mobilisation can translate to reductions in harmful youth drug use. Further work will also be required to establish that community mobilisation programs can be effectively disseminated outside of the context of research demonstration programs.

Research is warranted to investigate the feasibility of community mobilisation in the Australian setting. The results published on community mobilisation interventions for reducing youth drug use are promising, but not assured. The costs of these programs are considerable and they would need to guarantee superior results, compared to well-implemented school-based health education alone, before this approach could be recommended for wide-scale implementation. It is vital to ensure the fidelity of program implementation if an objective evaluation is to be conducted. Communities That Care (CTC) is a well-structured training and consulting program developed in the US that includes elements of community mobilisation. CTC consists of a series of training activities designed to advance community readiness and capacity to deliver evidence-based prevention programs within local prevention coalitions. The program seeks to assist the formation of community coalitions and to facilitate these coalitions to develop and implement prevention strategies carefully tailored to local conditions. The program has been developed for implementation in Australia but has not been evaluated for its impact on youth drug use.⁴⁵⁹

8.11 Health service reorientation

Definition: Reorientation of existing health services to modify developmental risk and protective factors and for enhancement of service access for young people.

There is tremendous potential for health services to make an important contribution to broader community agendas in preventing or reducing harmful youth drug use. However, there are not many studies testing the impact of early

interventions involving health services on drug use by adolescents and young people. This area requires further research.

There are many studies, mainly from the US, that report on the existing practice of primary health care professionals in preventive screening or health promotion offered for health risk behaviours including alcohol, drug and tobacco use.^{729–735} Some report on interventions to increase health risk screening practices by primary health care providers.^{736, 737} As with school-based education, some recommend that preventive screening begin in early adolescence, before longitudinal studies show many youth have initiated substance use.⁷³⁸ However, these studies do not evaluate the effects that screening or health promotion advice offered during a traditional consultation has on the substance use behaviour of attending adolescent patients. Adolescents and families want their physicians to address concerns such as substance use,⁷³⁷ and young people rate health care providers as the most credible sources of information secondary to parents.⁷³⁹ It is acknowledged that screening is only part of the solution to tackling substance use in health services. Without knowing about substance use, health care providers will not be able to direct adolescents to appropriate services or institute interventions themselves. Typical barriers to physicians screening for sensitive adolescent issues include: time limitations, lack of knowledge and skill, inadequate remuneration,⁷⁴⁰ not knowing what to do with a problem once found,⁷⁴¹ concern about possible negative impact on the physician-family relationship, and quality of medical care and organisational issues.⁷³⁷

Effective training programs can help increase the screening practices of physicians.^{736, 742} Other approaches have been to change the method of health risk screening from physician interview to self-completion questionnaires that can be later discussed with a health care provider. Paperny and Hedberg evaluated a strategy for providing preventive health services to adolescents using computerised health assessments with individualised educational videos, trained health counsellors and nurses. Settings for these assessments included schools, universities, shopping malls and after-hours clinics on Oahu, Hawaii.⁷⁴³ Participants spent an average of 21 minutes on the health assessment and viewing multimedia, followed by 15 minutes with a health counsellor. One-third of participants required a further evaluation and counselling by the health nurse (average 8 minutes). Over two-thirds (71%) of the 258 youth of mean age 17 years preferred this

method to traditional office settings and 92% felt the time spent was acceptable. On exit interviews, adolescents recalled 81% of the documented discussions by the health counsellor and 64% of the anticipatory guidance. Health counsellors identified problems and provided counselling more often than office-based clinicians on important health issues, including alcohol use. This method of health screening was also only one-fifth the cost of standard preventive visits.

Once substance use is detected, effective interventions are needed to help the users at various stages. A means of detecting appropriate types of treatment is also needed.⁷⁴⁴ Available evidence reveals a range of programs have been developed: some have been delivered in health services, whilst others have been integrated in other settings including schools and universities.

A potentially important strategy for reorientating health services involves moving the site of the service delivery into schools. Integrating school nurses into schools has been shown to have benefits in reproductive health.¹⁴ However, there is a paucity of studies evaluating this integration of health services into schools as a strategy for reducing youth drug use. The Centre for Adolescent Health has aimed to increase school students' help-seeking skills and behaviour by developing the 'Health Access Workshop'; delivered by primary health care providers in conjunction with teachers. This approach has not been formally evaluated, but pilot studies indicate students receiving the program gain knowledge about the types of services available and how to access them. Whether this translates to actual access requires examination.

Tobacco

Summary: Warrants further research  1/3

There has been some evaluation of programs including elements of school drug education that rely on the involvement of health professionals for coordination and content. The overall evaluation of these programs suggests their impact in reducing youth tobacco use may be positive but the evaluation designs generally do not enable assessment of the specific intervention benefits of health professional involvement.

A program that incorporated lessons by the health visitor and the local physician was delivered to students from 6th to 9th grade in the town of Steigen, Norway, where smoking prevalence rates were well above the national average.⁷⁴⁵ A demographically similar municipality was chosen as a control community. Students were recruited in

grade 6 each year, from 1992, so that by 1995 all students in secondary school were participating. The intervention consisted of two lessons at the end of grade 6, and 10 lessons each year in grades 7 through 9. The education provided information on the short- and long-term consequences of smoking and each student was asked to sign a contract to remain a non-smoker during the remainder of secondary school. Brochures were sent to parents and students watched and produced educational videos. In grade 8, they were required to produce a program for the local radio station, write letters for local papers and prepare posters. There was an incentive, in the form of a chance to win a CD player, for those who remained 'smoke free' until the end of year 9. In 1995, the prevalence of daily smoking was 80% lower in Steigen than in the control community, and those who smoked daily smoked 50% fewer cigarettes.

It is reported that the school physician led the project until he moved in 1995 to another county and that, following his departure, enthusiasm for the project diminished. This intervention appears to have been relatively successful in a high-risk community but, apart from some evidence suggesting leadership characteristics were important, the value of having a medical authority involved is not clear.

Health professionals, particularly those working at a primary care level, have an accepted status and unique opportunity to advocate in local communities for action in relation to adolescent tobacco use and other health risk behaviours. They also appear uniquely placed to play a role with young people with whom they come into contact. Relevant professionals include community and primary care nurses, general practitioners, dentists, pharmacists, and school counselling and health personnel.

There have been a number of reports of successful attempts to use the influence of health professionals to modify smoking behaviour in adults^{746,747} and some preliminary studies of the potential role of health professionals with youth, both in the prevention of smoking and promoting smoking cessation. Klein *et al.* reported findings from a training program for paediatric residents in the United States.⁷⁴⁸ One curriculum element related to tobacco use and was based on receiving and working through smoking cessation guidelines from the National Cancer Institute. However, substantial barriers to training were found, including non-attendance at scheduled lectures and failure to work with homework materials. Few

differences were found between participants of the intervention group compared to controls in relation to smoking uptake or physician practice.

A more recent study of an educational intervention with post-qualification dentists in the United States also had largely negative findings.⁷⁴⁹ Clinicians from seventy-seven dentistry offices received 1.5 hours of training based on smoking cessation guidelines from the National Cancer Institute. Elements included the current profile of youth tobacco use, the role of the clinician, and instruction on creating a tobacco-free environment. A strategy of using anti-tobacco prescriptions in non-smokers was also taught and encouraged. A small financial incentive was given for each 'script' administered. A total of 17 925 adolescents were followed up, with a 93% completion rate in experimental and control groups. No difference in smoking rates was found between adolescents attending intervention and control practices. It was noted that implementation of the strategy by clinicians was sub-optimal. Only 64% of participating practices issued prescriptions and only 14% reached their target. This was a probable explanation for the disappointing findings.

A more successful attempt to control tobacco use through the reorientation of health services was reported by Lionis and colleagues, in Crete.⁷⁵⁰ In this intervention, health professional assistance was integrated within schools through the provision of a health examination and a broad-based health education curriculum. The intervention was well received by parents and was associated with reduction in a variety of cardiovascular risk factors, including significantly less initiation of tobacco use in the intervention group (6%) compared to the control group (20%), after one year.

Several health service strategies have been reported for control of tobacco use, though considerable work will be required to establish models of practice and methods for overcoming the considerable implementation challenges. Further investment to encourage innovation and evaluation would appear warranted.

Alcohol

Summary: Evidence for implementation ★^{3/3}

There have been some effective interventions aimed at reducing harmful alcohol use in university students. Marlatt and colleagues conducted a randomised controlled trial evaluating a brief intervention designed to reduce the harmful consequences of heavy drinking among high-risk college students.⁷⁵¹ They followed up participants annually, for four years post-intervention.⁷⁵² All

students who were to attend the University of Washington were mailed a questionnaire about frequency of alcohol use and drinking-related consequences before finishing the last year of secondary school. Fifty-one percent of the students returned the questionnaires and consented to further involvement. Twenty-five percent of these students were identified as being high-risk in terms of their alcohol use and consequences. A normative comparison sample of students, including 33 high-risk students, was randomly selected in order to track natural changes in drinking patterns of the cohort over time. High-risk students were randomised to either intervention or control group. The intervention consisted of a single brief non-confrontational counselling session, with personalised individual feedback and motivational techniques. Each student was required to self-monitor their drinking pattern in a diary for two weeks before the counselling session. Drinking level was compared to norms for same-aged peers and became the resource for the personalised feedback. Follow-up assessments over four years showed that drinking problems declined significantly over time and the intervention produced significant differences in alcohol use and harmful consequences over the four years. High-risk students continued to experience more alcohol problems than the normative comparison group, though significantly less in the intervention group than high-risk controls. Among high-risk participants, 67% of the intervention group compared to 55% of high-risk controls had good outcomes over four years. Most students, overall, showed a decline in problems over time indicating a developmental maturational effect.

An earlier study by Baer *et al.* tested three methods of alcohol risk reduction with young adults.⁷⁵³ Volunteers were randomly assigned to receive a six week class and discussion group, a six unit self-help manual, or a single one hour feedback and advice session with professional staff. The interventions were based on a skill-based approach to reducing alcohol use, involving cognitive-behavioural self-management principles, challenging assumptions about alcohol effects, and brief motivational interviewing techniques. Results showed significant reductions in self-reported drinking post-intervention (approximately 40%) and maintenance of these reductions at a two year follow-up. Comparable drinking reductions were rated across treatments except in those who did not comply with the self-help reading program. The conclusions from this study, however, are preliminary because there was no control group receiving the

assessments alone and self-report may have invited socially desirable responses.

These studies indicate useful approaches to reducing the harm of alcohol use in older adolescents and young adults by integrating health advice within the university setting. In other studies, programs have been integrated within health settings.

Rickert and colleagues used random assignment to evaluate two alcohol health promotion strategies for use with young people visiting a primary health clinic.⁷⁵⁴ In one case, the youths were exposed to a computer-generated instruction program on alcohol and cannabis use, and in the other, a physician delivered anticipatory guidance. At post-test, both conditions resulted in significant increases in knowledge of alcohol and cannabis relative to a control group. Female subjects preferred the computer-assisted instruction while males preferred the physician encounter. The impact of this one-off intervention on subsequent alcohol and drug use was, however, not evaluated.

Oliansky *et al.* evaluated the effectiveness of brief interventions in reducing substance use among at-risk primary care patients in three community-based clinics.⁷⁵⁵ All adolescents were screened and a nurse-led educational intervention, including pamphlets, motivational interviewing and setting a contract for personal goals, was associated with reductions in self-reported alcohol use in the intervention group compared with controls. There was, however, no objective measure of alcohol use.

There exists some evidence to support selective interventions within schools. Werch *et al.* evaluated a three-phase intervention selectively targeting schools with high proportions of African-American students.⁷⁵⁶ Student volunteers were randomly assigned into the control or an intervention that involved three components: a self-instructional module, a health consultation with a physician or a nurse, and a follow-up consultation with a trained peer health educator (an 8th grade student). Instructional messages were tailored to the stage of alcohol use exhibited by the young person. Relative to the control group, receiving only untailored alcohol information, participants in the program demonstrated a number of benefits at follow-up. Participants perceived lower prevalence rates for adult drinking and considered themselves potentially more susceptible to alcohol problems. Their intentions to stop or reduce drinking increased and there was a small significant effect for reductions in the quantity and frequency of alcohol consumed. Participants evaluated the nurse contact particularly highly.

The screening and brief intervention model has emerged as a promising approach for health service reorganisation aimed at reducing alcohol problems. The further implementation of this model should be accompanied with investment for training and behavioural outcome evaluation.

Cannabis and other illicit drug use

Summary: Warrants further research  0/0

There are no studies evaluating impacts on illicit drug use following health service reorientation. There are interventions targeting youth with a high number of risk factors where health services are involved, but the effects of the health service component would be difficult to segregate. The Children at Risk (CAR) program, described on p. 132, provides an example of a strategy incorporating elements of health service reorientation and preventive case management. This approach has not been evaluated for its impact on illicit drug use

A study by Catron and Weiss has evaluated a school-based mental health service for high-risk children with serious emotional and behavioural problems.⁷⁵⁷ Results indicated that school-based services were more likely to be accessed. Ninety-eight percent of children (mean age 9.6 years) referred to the school-based service entered services, compared to 17% referred to traditional clinic-based community agencies. There were no results on treatment outcomes or attrition, however. These results introduce the possibility that service access for youth with a high number of risk factors may be enhanced through adaptation of service models.

8.11.1 Summary of evidence for reorientation of health services

Health service reorientation appears a promising intervention strategy. There is now reasonable evidence that a variety of strategies can be used to improve the accessibility and effectiveness of existing health services relevant to young people. Ensuring existing services maintain a prevention focus and utilise effective methods of engagement would appear a fundamental step in the process of tackling drug issues.

Two study teams have demonstrated outcomes relevant to alcohol misuse. In two studies, Marlatt, Baer and colleagues demonstrated reductions in harmful alcohol use through early intervention with college students in the United States.⁷⁵¹ Werch and colleagues have demonstrated an impact with early secondary school students.⁷⁵⁶ Although the

indicators are very promising, to be confident this strategy can consistently achieve outcomes will require further research.

Further research investment is recommended to encourage program innovation and evaluation of universal health service reorientation strategies targeting youth drug use. This investment should be made in partnership with agencies responsible for health and mental health.

8.12 Employment, and training

Definition: Includes provision of pre-employment assistance, employment experience, training or intervention in a post-school training setting, with the aim of advancing adolescent health.

Tobacco, alcohol, cannabis and illicit drug use

Summary: Limited investigation  O

Although a number of adolescent alcohol initiatives focus on secondary school populations, there appear to be important further opportunities to modify alcohol and other drug use through the period from adolescence to adulthood. The entry to the workforce and to post-secondary education is an important developmental transition influencing youth alcohol and drug use. No evaluation studies were identified examining impacts on drug and alcohol use of employment and training programs.

8.13 Social marketing interventions

Definition: Use of the mass media to promote a health message relevant to the prevention of harmful youth drug use.

There is good evidence that mass media strategies can convey a health promotional message to a high proportion of young people. Radio appears as effective as more expensive media. Less attention has been paid to media such as the internet and teenage magazines. There is no good evidence that simple 'one-off' media campaigns affect drug use in the young. There is better support for the use of mass media in combination with other strategies such as school-based health education or community mobilisation.

Tobacco

Summary: Evidence for implementation  2/6

The mass media have been commonly used in tobacco prevention approaches. Relevant media include television, radio, movies, internet and teenage magazines. The attractiveness of these approaches lies in their capacity to reach a large

teenage audience quickly, but there have been considerable doubts expressed about the effectiveness of this strategy.

The Cochrane Collaboration published a review covering mass media interventions for preventing smoking in young people, in 2001.⁷⁵⁸ The review included randomised trials, controlled trials without randomisation, and time-series studies that assessed the effectiveness of mass media campaigns in influencing the smoking behaviour of young people under 25 years of age. Of the 63 studies that were identified as reporting information about such campaigns, only six met the selection criteria. Five were conducted in the United States and one in Norway. All six studies reported outcomes between one and two years post-intervention; only two reported a significant impact on smoking behaviour.

In Norway, two counties matched for size, smoking prevalence and socioeconomic variables were allocated to either a provocative media campaign targeting 14 to 15 year olds or the control condition.⁷⁵⁹ Surveys were conducted at baseline, in 1992, and post-campaign, in 1995. In the interim, the intervention county was subject to three annual media campaigns each of three weeks duration. The first two campaigns were specifically targeted at girls and the last was targeted at both genders. In spite of the fact that only 63% of the intervention group had exposure to the media used to deliver the campaigns, Hafstad reported that one year after the final campaign, their prevalence of daily smoking was significantly lower than in the control group. There was considerable loss to follow-up in both the intervention and control counties but after adjustment for response rates, the findings remained significant.

One unpublished study assessing a television campaign targeted at students between 10 and 12 years of age was included in the Cochrane review.⁷⁵⁸ It was reported that 18 months post-intervention, there was no significant difference in the smoking behaviour of the intervention and control groups.

A variety of intervention conditions were assessed in one study, including a media campaign, a school-based programme, delivery of health information, no intervention, and a combination of the media campaign and school-based program.⁷⁶⁰ The study showed no consistent program effects on smoking behaviour; however, there was more than a 50% loss to follow-up and the integrity with which interventions were delivered varied significantly. An earlier study, comparing a media campaign only with a combination of a media campaign and a school-based program, also found no significant

difference in smoking behaviour or intention to smoke two years post-intervention.⁷⁶¹ However, loss to follow-up was very high (71%) and therefore this study makes little contribution to the weight of evidence for the influence of mass media campaigns on smoking behaviour.

Bauman *et al.* compared three mass media campaigns: first, eight 30-second radio messages focusing on the consequences of becoming a regular smoker; second, an additional 60 second radio message inviting 12 to 15 year olds to join an 'I won't smoke sweepstakes' and recruit friends to the program; and third, a television broadcast of the sweepstakes.⁷⁶² A randomised design was used to compare six intervention geographic areas with four controls. Radio brought a modest shift on the expected consequences of smoking and proved as effective as television in shifting these views. There was little effect of the peer recruitment strategy. No effect was found on smoking behaviour.

Flynn *et al.* reported a strategy from Vermont and Montana, US, of combining a mass media approach with social learning-based school smoking prevention programs for school years five to 10.^{507, 763-766} The mass media intervention used radio and television, with spots either 30 or 60 seconds in length placed in programs likely to appeal to 'high-risk girls' and 'high-risk boys'. The content of the mass media campaign was consistent with that of the school-based intervention. Two groups were compared: those receiving both mass media and school components (one community in Vermont and one in Montana), and those receiving the school intervention only (one in Vermont and Montana). The combined groups showed positive shifts on attitudes to smoking and rates of peer smoking, and there was a 30% reduction in weekly smoking rates in the mass media exposed students compared with those receiving only the school-based program. The effects persisted in exposed students two years after completion of the intervention.⁷⁶⁶

Murray *et al.* examined the effects of a Minnesota state wide mass media campaign on smoking attitudes and beliefs in teenagers.⁷¹⁸ The campaign took place over a five year period in the mid-1980s and used a range of media: television, radio, newspapers and billboards. Comparison was made with neighbouring Wisconsin where no similar initiative had been taken. Student surveys indicated that the advertisements had great penetration with those aged 10 to 16 years and a much greater recall of anti-smoking messages. However, there was little shift in beliefs about smoking and no concomitant shift in smoking prevalence rates.

Research on the effectiveness of different anti-smoking messages in the United States was published, in 1998.⁷⁶⁷ Data were collected from 186 focus groups, involving more than 1500 children and adults, to evaluate the effects of different anti-smoking advertisements that had been aired and additional concept advertisements. All advertisements were classified by their primary message and eight different categories were recognised: industry manipulation, environmental tobacco smoke, addiction, cessation, youth access, short-term effects, long-term effects, and romantic rejection. The anti-smoking messages that were found to be most effective in reaching all audiences were those depicting industry manipulation and environmental tobacco smoke.

Social marketing strategies targeting tobacco use are well developed and a considerable level of evaluation has been published. The evidence suggests that these strategies have little impact on behaviour when implemented alone. However, the work of Flynn and colleagues suggests that these programs can be effective when delivered in combination with other prevention strategies.

Alcohol

Summary: Evidence for implementation ★ 1/3

Harm minimisation introduces the requirement for relatively complex messages about youth and alcohol use. Recommendations for levels of use vary by gender and there is discretion as to the age at which parents should introduce children to alcohol. This complexity introduces challenges for the development of effective social marketing campaigns. The distinct nature of Australian policy means that scientific knowledge is limited for determining how specific messages will impact behaviour change. There is a particular need for Australian investment in social marketing to be accompanied by behavioural research. The evaluations conducted to date demonstrate some sophistication in utilising behavioural research; however, there has been a tendency for research to remain unpublished or to be published in-house rather than in peer-refereed research journals.

The Australian evaluation research makes clear that major campaigns have achieved their immediate objective of increasing public awareness of key messages. However, awareness of these messages has been inconsistently associated with behaviour change. As distinct from the tobacco research reported by Flynn and others in the US, there has been no use of geographic control groups.

The initial Australian Drug Offensive Campaign Against Alcohol Abuse was launched in 1988 and included five television commercials reinforced with notices in magazines, and on buses and trains. Key messages emphasised that: alcohol use could harm the physical development of young people, drunken behaviour could result in social embarrassment, responsible alcohol consumption was important, and parental modelling of alcohol use influenced the behaviour of young people.

Evaluation included a pre- and post-survey conducted with 2400 youth aged 15 to 17 years and a smaller number of parents. Youth reported high awareness of the television commercials but this awareness was weakly associated with actual or intended behaviour change. A small shift in parents' behavioural intentions was noted. As there has been little research to demonstrate that parents can influence youth who are using alcohol to drink moderately, it is unclear what effect the achievement of this campaign goal might have. The evaluation concluded that there had been some attitude change associated with the campaign.⁷⁶⁸

The campaign had three major stages: from 1988 to 1990, 1991 to 1992, and 1992 to 1993. Prior to the commencement and at various intervals, 10 national quantitative household surveys were conducted with samples of the target group of 15 to 17 year old teenagers. Drinking on the last occasion was one of the major outcome measures. It was found that there was a significant decrease in the proportion of teenagers consuming five or more drinks on the last occasion during the course of the stage III campaign, but a further increase over the period February 1993 to March 1995 when there was no national adolescent campaign activity undertaken.⁷⁶⁹

The year 2000 National Alcohol Campaign aimed to reduce alcohol-related harm amongst young Australians. The campaign targeted youth aged 15 to 17 years and parents with children aged 12 to 17. Messages were conveyed via a range of media, including television, radio, cinemas, magazines, newspapers and a web site. The campaign also included media components specific to people from Indigenous and non-English speaking backgrounds.

Key messages for young people emphasised 'drinking choices', with 'excessive drinking' portrayed as socially unacceptable and having the potential for regretted consequences. The decision to avoid excessive drinking was contrasted as having social and health benefits. Behaviours recommended for avoiding excessive alcohol use included: eating before drinking, monitoring the amount and pace

of drinking, and substituting with non-alcoholic beverages. Youth were encouraged to avoid social pressures to drink, but how to achieve this was not specified. The parents' role in educating young people about the possible consequences of excessive alcohol use and the need to set limits was emphasised by the campaign.

Household and phone surveys, with samples of around 1000 parents and young people, were conducted before and after the launch phase. Awareness of the campaign was high, with 88% of young people and 81% of parents reporting awareness. Young people reported the campaign had prompted them to think about the potential negative consequences of drinking (94%) and 63% reported discussing the messages with friends. Of parents, 51% reported responding to the campaign by talking with children about excessive alcohol use and by 'keeping an eye on them'. Parents accepting that 'teenagers learn to drink from the way their parents drink' increased from 64% to 71% over the course of the campaign. The evaluation noted some small reductions in alcohol use across the surveys but was unable to associate these with the campaign. Levels of potentially harmful alcohol use remained high at the end of the campaign.⁷⁷⁰

In 1997, the NSW Government ran the 'Drink drunk the difference is U' campaign. Evaluation suggested high awareness and approval and there was some intention to change binge-drinking behaviour reported. In 1998, the Victorian Department of Human Services conducted a summer/autumn events mass media campaign in cinemas, promoting harm reduction. A small evaluation suggested this campaign was widely recognised and well-accepted by Victorian youth.

Community-based health education, including circulation of pamphlets providing information on drug use and harm minimisation information, is one of the most popular approaches to drug education in Australia. Various information pamphlets have been circulated by the State and Australian governments and through agencies such as the Australian Drug Foundation. However, there were no studies identified evaluating outcomes from this approach and its effectiveness as a stand-alone strategy remains questionable. Rigorous evaluation is required to establish conditions where by this strategy might be effectively utilised for behaviour change.

Mass media campaigns have been successfully incorporated into wider community mobilisation campaigns but we have not managed to locate studies evaluating their specific impact on youth.

The alcohol industry invests heavily in mass media campaigns that include youth targets.

The evaluation work conducted to date, in Australia, suggests that the impact of major social marketing campaigns have included public awareness and attitude change. However, there is little evidence to associate this awareness with behaviour change. A large body of international follow-up research, and some cross-sectional Australian research, demonstrates that early age alcohol use is a risk factor for the subsequent development of alcohol-related harm. In contrast, there is little research to suggest how teenage alcohol users can be encouraged to do so moderately. Given there is considerable uncertainty, the relationship between harm minimisation campaign elements and youth behaviour needs to be carefully evaluated. By limiting the initial launch of campaigns to selected geographic regions, it would be possible to more rigorously examine behavioural impacts and to evaluate the impact of different campaign components relative to control groups. This level of evaluation would require a closer relationship between research and service delivery but it is important given the scale of public expenditure involved and the level of harm associated with alcohol misuse.

Cannabis and other illicit drug use

Summary: Evidence for implementation ★^{2/2}

Efforts to address youth involvement in illicit drug use through social marketing face the challenge of targeting to the minority of youth involved in this behaviour. Donohew and colleagues reported an evaluation at pre-production of a televised, anti-drug, mass media campaign.⁷⁷¹ An individual-level risk factor for youth substance abuse, sensation seeking, was targeted in this intervention. Donohew and colleagues reasoned that media appeal and motivations for youth substance use would differ for those high and low in sensation seeking. Two television message campaigns were developed for 18 to 22 year olds, one for high sensation seekers and the other for low sensation seekers. Focus groups were used to identify distinguishing campaign features that would appeal to youth with these characteristics. Youth were exposed to televised messages that varied by media and sensation seeking format. Behavioural intention to call a hotline was found to interact with the type of message presented and high and low sensation seeking. A high sensation message (loud, vivid and changing) led to higher behavioural intention to call the hotline. However, evaluation did not extend to examination of behaviour change.

An Australian social marketing campaign targeting youth amphetamine use was run as part of the National Drug Offensive, from 1993 through to 1995. The campaign titled 'Speed catches up with you' utilised a mixture of media to raise awareness of harms associated with amphetamine use. A series of four household interview surveys, each consisting of around 1200 young people in the age range 15 to 30 years, were conducted at key points over the course of the campaign. At the end of the campaign, recall of television commercials was evident for 70% but there was less recognition of newspaper (19%), billboard, radio or magazine advertisements (10%). Of those reporting television exposure, 84% could accurately describe key messages (e.g. 'you never know what's in it'). There was some evidence to associate this campaign with behaviour change. During the early, intensive phases of the campaign, intentions to use amphetamines steadily decreased, from 56% down to 35%, amongst previous amphetamine users. However, intentions returned to baseline levels once the campaign finished.⁷⁷²

The National Illicit Drugs Campaign, launched in 2000, represented an important strategy shift in its acknowledgment of the role of the family in preventing youth involvement in illicit drug use. The campaign aimed to deter the initiation or continuation of drug use by children by encouraging parents' and carers' communication. Campaign elements incorporated a range of media, including television, newspaper, magazine, billboards, a web site, and a phone contact line. A parent booklet was distributed to all households in Australia. Resources were also tailored for delivery to people from non-English speaking backgrounds.

Evaluation included a series of telephone surveys with parents (n = 1800) and other adults, and also phone and face-to-face surveys with young people. Surveys were staged for completion before and after the campaign launch. Awareness of the campaign was almost universal, at 97% for both youth and adults. Of parents, 68% were aware of the booklet and 47% reported they had taken some action in response to the booklet. The percentage of young people who had discussed illegal drugs with their parents rose from 26% to 44%, and those agreeing that 'advice from my parents has steered me away from drugs' increased from 57% to 71%. Similar positive effects were noted for non-English background families. Although positive family communication is an accepted protective factor, the report did not attempt to associate these impacts with changes in youth drug use.⁷⁷³

Illicit drugs social marketing campaigns have been effective at gaining awareness, improving family communication and impacting behavioural intentions. Further evaluation should investigate the translation of these promising impacts into behaviour changes.

8.13.1 Conclusions—social marketing

There is good evidence that mass media strategies can convey a health promotional message to a high proportion of young people, and television appears to be an important component. But there is no good evidence that simple 'one-off' media campaigns can alter the long-term development of drug use in the young. There is better support for the use of mass media in combination with other strategies such as school-based health education or community mobilisation.

The work of Flynn and others suggests that evaluations can be designed to assess the community-level impact of social marketing campaigns on youth behaviour. Investment in social marketing in Australia is typically associated with lower levels of evaluation evidence, such as pre- and post-marketing consumer recall surveys. Given the large investment of public funds involved, the failure to test social marketing strategies within more rigorous community trials must be questioned.

Investment is warranted to enable rigorous evaluation of social marketing campaigns to establish directions for achieving outcomes on community-level youth behaviours. To ensure public health investment achieves behaviour change, a stronger commitment to evaluation will be required in developing service delivery contracts. Future service delivery could be introduced into geographic regions in phases determined by randomisation. Behavioural measurement could then be used to assess comparative impacts for regions exposed and not exposed to social marketing. Of the specific drug types that could be potentially targeted through these approaches, it appears that both tobacco and illicit drug use may be amenable to universal social marketing approaches. Youth alcohol use messages within harm minimisation programs are particularly complex with targets such as limiting the frequency and amount of use and different recommendations for males and females. This complexity suggests a requirement for behavioural research to develop feasible campaign targets.

Future evaluations could trial the different campaign goals of delayed use of youth alcohol versus harm

reduction in community intervention trials. Trialing different prevention goals would offer an important opportunity to examine the potential of social marketing to contribute to a reduction in drug-related harm.

8.14 Law, regulation and policing

Definition: Setting and enforcing laws and regulations regarding the minimum age for purchasing or using substances.

Legislation to restrict alcohol and tobacco sales to children and adolescents has been in place since the early part of this century. When appropriately enforced, such legislation appears to be effective in reducing early use of both tobacco and alcohol. The illicit status of drugs may influence the attitudes and behaviour of some young people; however, being convicted for drug use can also have harmful consequences. Balancing these considerations has led to proposals to move cannabis use from a criminal to a civil offence. Current evidence suggests these changes have not increased cannabis use amongst young people. Efforts to divert youth apprehended for drug offences into health and social services appear to be promising as early intervention approaches.

Tobacco

Summary: Evidence for outcome effectiveness ★★

There is now reasonable evidence that it is possible to reduce youth tobacco use by preventing retailers from selling cigarettes to young people (for a summary see Toumbourou *et al.*).¹⁴ Successful strategies include social marketing to ensure regulations are well understood, the use of minors as confederates to monitor retailer compliance, and the use of graded penalties (enforcement officers can be reluctant to enforce very large fines) and positive feedback for compliance. Recent evidence suggests programs have been successful at restricting sales to minors, and that such restriction in availability translates to reductions in youth tobacco use. An important evaluation was conducted by Forster *et al.* who described a randomised, controlled trial in 14 Minnesota communities where a combination of strategies reduced illegal tobacco sales.⁵⁰⁴ After 32 months, rates of daily smoking in year 8 to 10 students in the intervention communities were 10% compared with 16% in control communities. If restricted to one geographic area, there is a need to consider the extent to which sales might occur in other communities.⁷⁷⁴

Alcohol

Summary: Evidence for outcome effectiveness ★★

While it is well established that raising the drinking age reduces overall levels of alcohol related harm,⁷⁷⁵ changes to the uniform Australian drinking age of 18 years is unlikely given a lack of community support.¹⁸⁶ It has been noted that strict enforcement of existing laws on minimum drinking age tends to be an effective means of reducing harm without incurring controversy, and receives strong support from the wider Australian community.¹⁸⁶ A large multi-site randomised trial of the enforcement of minimum drinking age laws in the US demonstrated a significant reduction in youth access to alcohol.⁷⁷⁶ There is great scope for prevention through greater attention to this issue as there is evidence that compliance with these laws is at best patchy in Australia, rendering youth access to alcohol comparatively easy.¹⁸⁶

Cannabis and illicit drugs

Summary: Warrants further research 

Evidence that is more fully reviewed in Chapters 13 and 14 suggests there is potential to further evaluate the impact on youth cannabis and illicit drug use of law, regulation and policing strategies. There is currently some debate regarding the effectiveness of laws that prohibit cannabis use. Such laws may have a deterrent effect for some youth, conveying a message that cannabis use is not socially approved. However, criminal penalties also run the risk of creating harm and social alienation where youth drug use results in a criminal offence. In balancing these considerations, the possibility of reducing from criminal to civil penalties appears feasible. In States that have relaxed criminal penalties for cannabis use, there is no evidence that cannabis use has increased. In cases where youth are charged with illicit drug use, there may be opportunities to reduce escalation to harmful drug use through diversion programs. Such programs provide targeted entry to strategies such as family intervention and preventive case management.

8.14.1 Conclusions—law, regulation and policing

Setting and enforcing laws and regulations regarding the minimum age at which youth can purchase and use tobacco and alcohol appear to be effective in delaying initial use. To be effective, strategies require a coordinated approach, including social marketing to ensure regulations are understood, the use of minors as confederates to

monitor retailer compliance, the use of graded penalties and positive feedback for compliance. Further research and evaluation are required to better establish the influence of laws, regulation and policing strategies on youth involvement in cannabis and other illicit drug use. The application of programs to divert youth apprehended by police and the courts into effective intervention services may be a promising early intervention strategy but to be effective, such strategies will require considerable coordination between services and administrative jurisdictions.

Few studies have evaluated outcomes relevant to illicit drug use. More intensive strategies, including family intervention and preventive case management, appear promising for preventing harms associated with illicit drug use in interventions targeting adolescents with a high number of risk factors.

8.15 Conclusions—intervention through adolescence

Considerable progress has been made over the last decade in the identification and evaluation of strategies that can successfully prevent patterns of adolescent drug use associated with later harms. However, there are few studies that have completed follow-up over a sufficient period to demonstrate that reductions in early drug use translate to subsequent reductions in harmful drug use.

The focus of research investment has been largely skewed toward school-based drug education. Other strategies have received less attention. Evidence suggests that there may be particular advantages through the integration of more than one health promotion strategy. The enforcement of laws and regulations appears important in reducing early age tobacco and alcohol use but implementation may require coordination and support at the community level. Drug education campaigns conducted in the context of community mobilisation can be successful, though at this stage the effect sizes are not necessarily larger than those achieved through health education alone. The work of Flynn and colleagues suggests that combining drug education with social marketing may offer advantages in reducing youth tobacco use.

Some evaluations have been reported showing promise in engaging parents and families into interventions and in demonstrating outcomes following intervention. Existing studies mainly provide evidence for impacts and longer-term follow-up will be required to establish whether family interventions can reduce drug abuse.

CHAPTER 9: BROAD-BASED PREVENTION

9.1 Summary

A number of prevention strategies target harmful drug use as one component within a broader set of prevention goals. Examples of such broad-based prevention approaches include crime prevention initiatives, education strategies and health and mental health promotion strategies. In this chapter several broad-based strategies are reviewed, focusing on their relationship to policies and programs aiming to prevent harmful drug use. Many broad-based strategies, such as crime prevention and health promotion strategies, target drug use explicitly. Other strategies, such as social improvement and employment strategies, contribute to the reduction of harmful drug use by addressing common developmental determinants. In some cases, there may be conflicts and tensions between the goals of different prevention programs. Tackling crime through incarceration, or through poorly designed health education programs, has the potential to increase drug-related harm. Efforts to prevent harmful drug use need to be well integrated with broad-based prevention efforts. The immediate targeting of drug use and developmental risk and protective factors, articulated within various broad-based strategies, is summarised in the table below.

Broad-based Interventions*	Targeting:			Potential integration with the prevention of harmful drug use
	Drug Use	Risk Factors	Protective Factors	
Children and youth				
Early years investment		✓	✓	After around 15 years, could reduce some of the more severe drug use problems
School effectiveness		✓	✓	From 5 to 10 years, could reduce some illicit drug use; earlier universal impacts on licit drug use
Crime prevention	✓	✓	✓	Targets alcohol and illicit drugs; strategies such as incarceration can increase drug problems
Homelessness strategies		✓		Aggregating high-risk use could increase use
Adults				
Health promotion	✓	✓	✓	Directly targets harmful drug use
Cardiovascular disease	✓			Targets include tobacco and heavy alcohol use
Cancer	✓			Targets include tobacco and heavy alcohol use
Injury	✓		✓	Targets include heavy alcohol use
Community				
Health education				Widely used despite having little evidence for impacts on drug use, risk factors or protective factors
Reducing SES differentials		✓		Evaluation of investments could advance knowledge of potential to reduce drug problems
Mental health promotion	✓	✓	✓	Targets include harmful drug use
Community improvement			✓	Evaluation could explore improvements in developmental protective factors
✓	Based on a theoretical, policy or, in rare cases, an empirical relationship between the broad policy area and reductions in harmful drug use, reductions in developmental risk factors or increases in protective factors.			
*	Broad-based interventions do not lend themselves to the standard ratings, thus strategies are summarised in terms of their applicability to drug use and harm			

9.2 Introduction

In other sections of the current document, community and health service strategies that have been developed and evaluated with the explicit aim of reducing harmful drug use are reviewed. In this chapter, several broad-based prevention strategies are examined. There is a substantial degree of interrelationship between a number of these broad-based 'prevention' approaches and the prevention of drug related harm. This chapter reviews the overlap between these programs, the common risk factors that are addressed and, where possible, the question of how much impact these programs have on harmful drug use.

9.3 Broad-based prevention initiatives focusing on children and youth

9.3.1 Investment in the early years

Evidence that the first years of life are critical in shaping later development has led to an increased emphasis on investment in these years. Examples include work in the US with Head Start and, more recently, Fast Track (summarised in Chapter 7); work in Ontario in Canada flowing from the Early Years Study Group report;⁴⁸² and in the UK with the Sure Start program. Each of these programs is characterised by efforts to coordinate large investments from different areas of government to 'guarantee' that the early development of children will not be compromised by failure to receive basic needs for nutrition, security, or learning opportunities. In the case of the Early Years Study Group report, recommendations extended to changes in pre-school systems to enhance developmental potential for intelligence more universally.⁴⁸² The impetus for these investments includes brain research that has graphically demonstrated the role of adequate nurture in early brain development, developmental research tracking later life problems to failure in early development, and evidence that interventions in the early years make a difference later in life. In later sections, the evidence for interventions early in life is reviewed. In overview, the existing intervention findings are promising but there have been few studies with more than one to two years of follow-up and these exceptions have tended to be small studies. Although investment in this strategy should offer benefits, the current evidence suggests that reductions to drug-related harm may be limited if prevention investment were to exclude risks emerging at other life stages. In Chapter 6, follow-

up studies were summarised that demonstrate that risk factors for harmful drug use arise in childhood, adolescence and later in life. Further evidence suggesting that risk factors arise later in life emerges from well-controlled evaluation studies demonstrating that reductions in harmful drug use can be achieved through preventive investment in primary school and in later years of development. The Early Years Study Group report is an impressive document and has important implications for interventions to encourage the development of intelligence. However, the summary of evidence in that report concluded that crime prevention outcomes could not be obtained unless investment was made prior to the child's entry to school. That conclusion was based on a highly selective review of evidence and is at odds with the present review and also with the conclusions of other reviewers.⁴⁷² ⁷⁷⁷ Furthermore, there is evidence that where investments in early years programs have been applied beyond families with high risk factors for child neglect, there may be few gains to be made through such investments.⁵⁷⁴

9.3.2 Education strategies

Various Commonwealth and State Government programs aim to influence school and education environments in ways that are likely to have direct and indirect impacts on drug-related harms. For example, the Commonwealth Government school-based drug prevention policy emphasises prevention through education, information and safe and supportive school environments.⁷⁷⁸ In each State, there are a range of important programs that aim to enhance school learning environments and promote student health. The Education for Resilience report provides a summary of the evidence for a range of Australian and international school-based programs focusing on positive youth development.⁷⁷⁹ The report summarises the underlying principles of prevention and intervention, and describes various structures, programs and strategies. The approach emphasised in that report is congruent with a developmental pathways approach to prevention. The approach emphasises the improvement of school environments through evidence-based interventions that focus on reducing risk factors and enhancing protective factors.

A summary of the current evidence for risk and protective factors influencing harmful drug use was presented in Chapter 6. It included the finding that poor academic achievement, beginning in primary school, is a risk factor for harmful drug use. In Chapter 8, evidence was summarised demonstrating that drug education programs in secondary schools

prevent harmful drug use. Failure to complete secondary school and unemployment after leaving school are both predictors of illicit drug use. However, these predictors do not appear to be direct risk factors in that their influence on drug use appears to be explained by earlier determinants such as childhood behaviour problems, early academic failure and an earlier age of drug use initiation (see Chapter 6). It is likely that education programs that aim to improve academic outcomes and that begin in primary school may also result in a reduction of harmful drug problems. It is possible that improving employment rates will exert some beneficial impact on drug use problems but there has been less research on this question.

A range of Commonwealth and State programs aim to enhance school effectiveness and improve school environments.⁷⁷⁹ The evidence base for prevention strategies focusing on primary and secondary schools was summarised in Chapter 8. In overview, the evidence suggests that well-conducted prevention programs in primary schools may be among the best investments for addressing the development of harmful drug use. These programs appear to reduce risk factors such as negative peer involvement, conduct problems, aggression, victimisation, early age drug use and low school attachment. They may also work to enhance protective factors by increasing pro-social and responsible behaviours within peer groups, and bonding to teachers, parents and school. Outcomes from these programs may be relevant to a range of related prevention priorities, including crime, violence and mental health.

The evidence is also very strong that investment in effective drug education in secondary schools can contribute to preventing harmful drug use (Chapter 8). Effective programs in secondary school appear to reduce a range of risk factors that are more directly related to drug use. Risk factors that appear to be reduced by drug education programs include favourable attitudes to drug use, estimates of the prevalence of peer and adult drug use, specific social skills related to drug use, and communication with and attachment to parents. Programs addressing secondary school organisation and behaviour management may also influence a range of important risk and protective factors although there has been less work in this area.

9.3.3 Homelessness strategies

There is a strong relationship between homelessness and substance use.⁷⁸⁰ Substance use problems can cause or contribute to homelessness, and vice versa. Australian research has identified that approximately half of homeless Australians have a drug dependence problem, with heroin being the most common. Equally, half of Australian homeless people have been estimated to have a mental disorder. The Alcohol and other Drugs Council of Australia (ADCA) conducted a review of an early draft of the Commonwealth Homelessness Strategy, in late 2001. This review concluded that the Homelessness strategy should include three key priority actions related to drug use and the homeless. These are:

- provide support to families at risk of breakdown in times of crisis,
- fund specialist services for hard-to-reach homeless clients,
- provide more low-cost private and public housing.

No comment is provided on evidence for the effectiveness of these interventions.

In a large representative survey of Victorian secondary school students, Bond *et al.* examined the relationship between developmental risk and protective factors for youth drug problems; an index was designed to measure risk for homelessness (e.g. running away from home and conflict with parents).⁷⁸¹ The report found that the cumulative number of elevated risk factors and depressed protective factors were associated with increasing rates of homeless risk. This evidence suggests that programs that are effective at reducing risk factors and enhancing protective factors for youth involvement in harmful drug use will have relevance for efforts to prevent homelessness. It is also apparent that efforts to reduce youth homelessness will have unique components that may be unrelated to efforts to prevent drug problems. Strategies that reduce homelessness may also have a positive impact on drug use problems but there also exists the potential for policy conflicts. For example, where accommodation policies lead homeless youth to aggregate with youth with a high number of risk factors, involvement in harmful drug use might increase. Readers are encouraged to refer to the chapter on social determinants for a discussion of the nexus between homelessness, social estrangement and problematic drug use.

9.3.4 Crime prevention

A large proportion of this section is indebted to the work of Don Weatherburn of the NSW Bureau of Crime Statistics and Research. He and his colleagues have produced a literature review on the efficacy of crime prevention and mitigation in reducing illicit drug use, which will be cited liberally along with relevant content identified by the review process and consulted experts.³⁹⁷

Another key contribution is derived from the work of Ross Homel and colleagues on the Pathways to Prevention series.^{9, 472, 782} As this document is primarily concerned with the primary prevention of crime in young people it is central to significant interactions between crime prevention policy and the prevention of harmful drug use. The series acknowledges that it is firmly grounded in the developmental pathways approaches,⁸ which focuses on modifying early risk and protective factors through interventions directed at an early stage in the developmental pathway leading to crime. To the extent many of the determinants that lead young people to engage in crime are common with those that lead to harmful drug use, the developmental approach to crime prevention provides an important model for advancing the prevention of drug-related harm.

Risk factors for violence are very similar to risk factors for harmful youth drug use. These include factors undermining healthy childhood development including inadequate parenting, troubled family relationships and poor school achievement.^{9, 472, 782} Early age involvement in alcohol and drug use is also a risk factor for the development of crime and delinquency. Lifestyles involving harmful drug and alcohol use are closely interrelated with crime.³⁹⁷ Accordingly, crime prevention programs have a great deal of overlap with programs preventing drug related harms. General recommendations for violence prevention programs include the notions that programs address multiple risk factors and enhance protective factors at the community, family, school and individual/peer levels. Programs are also recommended to be maintained across the course of development.³⁹⁷ Hence the developmental pathways approach to crime prevention is congruent with the Protection and Risk Reduction Approach recommended in the present document. The development of mechanisms to link investment and program delivery in crime prevention with efforts to prevent drug-related harm is warranted.

Broad crime prevention programs often include early intervention programs with disadvantaged and at-risk youth.³⁹⁷ Programs include a substantial focus on increasing social inclusion and offering youth the possibility of participating fully in social and economic life. Such programs attempt to promote the attachment of individuals and communities to mainstream social supports.⁷⁸² These approaches, once again, overlap with those that are emphasised through the Protection and Risk Reduction Approach to preventing harmful drug use.

There is also a broad literature on preventing crime from a variety of approaches other than the developmental pathways approach. Traditional labels for these include criminal justice, situational, community or social approaches.⁹ Criminal justice approaches refer to traditional deterrence and incarceration approaches, as emphasised by the criminal justice and policing system. There is potential for synergy with this category of crime prevention. There is also potential for conflict where, for example, policies such as incarceration lead to elevated rates of drug-related harms. The relationship between criminal justice policies and drug policy are considered more fully under the sections on supply reduction.

Methadone maintenance therapy (MMT) has been shown by Cochrane reviews to be an effective means of reducing drug-related criminal behaviours in opiate users,⁷⁸³ including property crime and actual heroin consumption levels. Significantly, this effect is demonstrated across cultural and ethnic contexts and varying study designs. Accordingly, methadone maintenance therapy can be considered a crime prevention initiative; further demonstrating the potential for additive benefits through well-coordinated prevention investment.

9.4 Broad-based prevention initiatives focusing on adults

9.4.1 Health promotion strategies

Australia has a well-developed public health system that identifies and places priorities on areas considered to significantly affect population health. Initiatives such as the National Public Health Partnership and the National Primary Prevention Strategy assist in the planning and coordination of national public health activities. A series of reports to Commonwealth and State Health Ministers address national health priorities and these currently include cardiovascular health, cancer control, mental health, injury prevention, musculoskeletal disorders and diabetes mellitus.

9.4.2 Cardiovascular disease prevention and health promotion

Cardiovascular health was identified as a target in the first National Health Priority Area (NHPA) report, developed in 1996; and reported on in 1999.⁷⁸⁴ The NHPA reports acknowledge the considerable overlap between the various priority areas in the factors that contribute to risk and the barriers to better prevention and care.⁷⁸⁵ Tobacco and alcohol misuse are acknowledged as risk factors for cardiovascular disease and other health problems. Monitoring demonstrates efforts are succeeding in improving cardiovascular health in Australia.⁷⁸⁶ In the intermediate monitoring for this program, successes in reducing adult tobacco smoking and the failure to reduce adolescent smoking rates have each been noted.⁷⁸⁵ A common theme in national health improvement efforts is the recognition of the importance of socioeconomic factors in behavioural risk modification.

A recent initiative of the Joint Advisory Group (JAG) in General Practice and Population Health is the Smoking, Nutrition, Alcohol and Physical activity (SNAP) Framework. This initiative has been developed by JAG in consultation with Chairs of National Population Health Strategies.⁷⁸⁷ The SNAP framework is intended to, 'guide the implementation of integrated approaches to behavioural risk factor modification in general practice focusing on smoking, nutrition, alcohol and physical activity' (p1). The program, which aims to coordinate State and national efforts, emphasises a system-wide approach to support the management of behavioural risk factors in general practice. The program should influence the extent to which the evidence base for behaviour change relevant to harmful drug use is applied within general practice. Research and evaluation is included within the broad outcome areas; however, evaluations of this program are not yet available.

9.4.3 Cancer and other disease prevention

Several policies on cancer prevention are relevant to drug use. Some of these policies and approaches to cancer prevention include strategies to reduce tobacco use and harmful alcohol use, and in these cases, initiatives overlap with those relevant to drug use prevention. Initiatives relevant to preventing drug use include: manipulating the price of cigarettes and the promotion and advertising of cigarettes, enforcing age limits on cigarette consumption, improving broad indicators of SES, improving opportunities in life through training

and employment, addressing social exclusion, assisting people to quit smoking, providing smoke-free workplaces, health education campaigns, developing healthy workplaces and healthy schools, and providing sensible drinking advice.⁷⁸³

Prevention of cancer in relation to cigarette smoking is almost entirely a function of encouraging people to cease use, and reducing the number of people commencing use. Australia's National Tobacco Campaign, a significant recent initiative, was focused on getting adults to quit, but does have some preventive effects by helping to 'de-normalise' smoking.⁷⁸⁸ The campaign was conducted by the Commonwealth, with advice from cancer prevention organisations and other non-government organisations, yet its goal was the prevention of uptake of drug use and the reduction of existing drug use, which are two of the primary goals of national drug policy. The effectiveness of specific anti-tobacco interventions is reviewed elsewhere. All initiatives encouraging reductions in smoking, or limiting drinking to within recommended consumption guidelines, can be considered cancer-prevention initiatives.

9.4.4 Injury prevention

Some interventions that have been considered in the context of injury prevention policy are also interventions that are of relevance to drug policy. These include reducing drink-driving and providing alcohol treatment services.⁷⁸³ The National Injury Prevention Advisory Council reports that it considers injuries from road trauma, suicide, falls, fire, drowning and assault to be among the many types of injuries it is concerned with preventing.⁷⁸⁹ These injuries all have some degree of overlap with drug use, particularly alcohol and, accordingly, there is significant overlap between national injury prevention approaches and drug and alcohol harm reduction policy.

Injury prevention strategies often encompass programs aimed at reducing road injury,⁷⁸³ a field that includes, as a substantial component, programs aiming to reduce the risk of drink-driving. Being dependent on alcohol dramatically increases the risk of death through injury, including by falling, fire, or burns.⁷⁹⁰ In the elderly, fall injuries are especially associated with problematic alcohol use.¹⁶⁷

A systematic review considered the impact of treatment for problem drinking on injuries.⁷⁹⁰ It determined that treatment for problem drinking may reduce injuries generally and that treatment for convicted drink-drivers would reduce subsequent motor vehicle crashes. The studies on injury

prevention all demonstrated significant effects and large effect sizes. However, small sample sizes used in the studies limited the ability to generalise from these results.

Alcohol is believed to be causative in many injury types including road trauma, falls, fire injury, drowning, assault and to some degree suicide.⁷⁸⁹ Population groups at high risk of injury include young men, the elderly, and people in rural/remote areas.⁷⁸⁹

A number of the strategies that have been recommended for implementation in injury prevention initiatives also appear relevant to the prevention of drug-related harm. Night patrol schemes in Indigenous communities have been singled out as an effective intervention worthy of further support in Commonwealth policy,⁷⁸⁹ although the report did note that further evaluation of their impact on injuries is needed.

Other approaches that have received endorsement for injury prevention include:⁷⁸⁹

- enforcing responsible service legislation to reduce alcohol-related injury,
- further work into the more widespread use of brief interventions by doctors to reduce problem drinking,
- the continued use of Australia's successful random breath testing programs to reduce injury related to driving under the influence of alcohol.

Interestingly, none of the literature on injuries and falls in the elderly mentioned either alcohol or any other form of substance use as an issue.⁷⁸⁹

In summary, injury prevention strategies accept that reducing harmful drug and alcohol use would reduce the rate of injury; as such, they directly target risky use of various substances. Therefore, the actual interventions intended to reduce injury in many cases overlap with the types of interventions recommended in efforts to prevent harmful drug use.

9.4.5 Health education

In many social and health service settings, a common strategy has involved the provision of information aimed at encouraging healthy behaviours. Many of these generalist health education initiatives include information relevant to avoiding harmful drug use. In other sections of this review, aspects of health education are examined under sections dealing with programs more

specifically targeting drug use behaviour. Relevant strategies include school-based drug education, community-based drug education, social marketing, and self-help materials designed for drug treatment. In this section, we briefly examine evidence evaluating broad-based health education programs.

Health education has been a popular health promotion strategy for quite some time. There is now a reasonable evidence base, derived from Cochrane reviews on various topics, and unfortunately, health education as a general strategy is fairly ineffective in changing behaviour, although some studies have shown small benefits.⁷⁸³ Whilst health education approaches tend to result in improvements in knowledge and awareness, the evidence base for claiming that education only programs contribute to actual changes in behaviour is fairly weak.⁷⁸³ There is some evidence that education only programs may have a limited effect in altering the behaviour of higher SES groups but not lower SES groups.⁷⁸³

The evidence reviewed earlier on school and community programs suggests there may be more support for health education as a component in a broader set of behaviour change interventions. If poorly designed, there is the potential for health education information to conflict with efforts to prevent harmful drug use. For instance, health education materials that convey information about how to access new drug experiences or that lead to upward estimation of the level of perceived peer and adult drug use may be contra indicated. Thus, there is significant potential for effective investment opportunities to be lost to ineffective health education. However, it is rare to find societal groups actively opposing health education programs. Those proposing 'self-evident' health education investments as a method of preventing drug use problems tend to find support from public and private funding agencies. To address this situation, a wider understanding of what is required for effective behaviour change needs to be disseminated to the broader community. There is potential for government investment in health education to advance the evidence by including behavioural evaluation in service delivery contracts. Directions for designing such evaluations were discussed in the earlier section on social marketing programs targeting youth.

9.4.6 Reducing SES health differentials

Given the strong link between SES and many health problems, including drug use, there is some literature on attempting to address the impact of SES on health differentials. Cochrane reviews have reached the brief and somewhat vague conclusion that structural and legislative measures appear to be the most effective means of reducing health inequalities.⁷⁸³ The source article for this claim reported on a review of 129 interventions aiming at reducing socioeconomic health differences. It noted that most interventions were not evaluated and that health education was the most common intervention. However, health education alone appeared ineffective and was only effective when combined with personal/social support and structural initiatives.⁷⁹¹

The review also concluded that there is not yet sufficient evidence on which to base rational policy to reduce socioeconomic health differences.⁷⁹¹

There is also no evidence on the impact of tackling social exclusion on any measure of health status.⁷⁸³ Some places in the US have conducted trials of income supplementation approaches. However, unfortunately, there is no experimental evidence available that allows us to assess the impact of such interventions on physical or mental health.⁷⁸³ A stronger integration between service delivery and research could achieve important gains. It would be possible to evaluate the community impact of government investments aimed at redressing social inequality and exclusion if such investments were introduced in phases, and assessments were conducted to compare community benefits. Such evaluation should be considered a priority given the potential gain that could follow improved knowledge of effective community investment strategies.

9.5 Mental health promotion and prevention

There are various strategies for promoting good mental health that are also relevant to the prevention of drug-related harm. These include reducing social exclusion, reducing alcohol and drug problems, assisting people to develop parenting skills, improving social support networks, improving education and training opportunities, reducing homelessness, reducing unemployment, and promoting healthy work environments.⁷⁸³ The evidence base consists of a number of literature reviews, a review of Cochrane reviews relevant to the public health agenda⁷⁸³ and documentation

supporting and describing government policy statements. The mental health promotion literature is largely grounded in theoretical understandings of the promotion of health and the prevention of ill-health.⁷⁹² Comprehensive literature that provided information on the actual impact of mental health promotion programs, on either mental health problems or drug use problems, could not be located.

Papers reviewed include a literature review of early intervention in the mental health of young people,⁷⁹³ the National Mental Health Strategy documents,^{794, 795} The Cochrane Collaboration⁷⁸³ and papers prepared for the National Co-morbidity Workshop.^{179, 376, 796, 797}

Mental health promotion is a broad term encompassing a range of programs that aim to improve mental health and wellbeing.⁷⁹⁵ It, therefore, includes primary prevention of mental health disorders, early intervention and treatment approaches.

Mental health promotion activities aim to protect, support and sustain the emotional and social well-being of the population by increasing the protective factors that lead to positive mental health outcomes across the entire intervention spectrum, that is, before, during and after the onset of mental illness (p34).⁷⁹³

Interventions aimed at improving mental health and wellbeing could conceivably reduce drug-related harm. Mental health problems and drug-related problems are associated with the same social determinants and risk factors.⁷⁹⁷ Therefore, programs that target these shared factors and determinants may improve mental health and reduce the risk of developing drug-related problems.

In addition, both current conceptualisations of mental health diagnostic systems (DSM-IV and ICD-10) consider drug use problems to be a mental health disorder. Accordingly, the National Mental Health Strategy⁷⁹⁴ is itself a form of intervention aimed at drug problems.

Mental health promotion strategies target the same basic issues as do broad primary prevention strategies: that is, to target the structural determinants of ill-health at a general level.⁷⁹³ By targeting factors such as socioeconomic gaps, unemployment, social capital, the physical environment and social beliefs and values, it is theorised that such strategies will have positive impacts on both drug-related harms and psychosocial disorders.⁴¹⁹ Evidence from the present review confirms that more extreme poverty and

social disadvantage are risk factors in predicting drug-related harm.

Cochrane reviews have determined that grief therapy does not yet have sufficient evidence of effectiveness to justify its routine use as a mental health promotion strategy.⁷⁸³ This is of relevance given the predominance of grief and loss as an antecedent to late-onset drinking problems in the elderly.

It is well established in the field that single factor short-term mental health promotion interventions rarely show any effect.^{419, 793} Accordingly, the mental health promotion field is concerned with broad-based, multi-level, multi-systemic approaches to the promotion of health and wellbeing. In so doing, it is addressing some of the same central issues as are addressed in drug policy. There are opportunities to improve the synergy between mental health promotion and prevention programs addressing drug-related harm. One important step forward is for drug policy to acknowledge the common relevance of the developmental pathways approach to prevention.

9.5.1 National mental health strategy

What follows is a broad overview of the National Mental Health Strategy,⁷⁹⁴ with specific comments on those elements of the strategy with a high degree of relevance to preventing drug problems. The National Mental Health Strategy is firmly based in a developmental pathways approach and focuses on developmental risk and protective factors for mental health. Within the strategy, 'prevention' is defined as interventions that occur before the initial onset of a disorder, to prevent the development of the disorder. 'Early intervention' comprises interventions that are appropriate for, and specifically target, people displaying the early signs and symptoms of a mental health problem or mental disorder; and people developing or experiencing a first episode of mental disorder. The theoretical framework has been influenced by the Institute of Medicine framework⁸ that is also directed at drug abuse prevention and crime prevention.

The National Mental Health Strategy assumes that the determinants of mental health status are firmly linked to a range of social determinants, including income, employment, poverty, education and access to community resources. As is indicated in other sections, these factors are also linked to drug problems.

These social determinants are seen to translate at the individual level into risk and protective factors influencing the risk of mental health problems. Such risk and protective factors exist at the genetic, biological, behavioural, psychological, sociocultural, economic, environmental and demographic levels. The strategy asserts that prevention of mental health problems is more likely to be successful if it considers multiple risk and protective factors and if it simultaneously includes a range of interventions targeting these multiple risk factors.

The National Mental Health Strategy recognises that the majority of risk factors for mental health problems lie outside the traditional domains of mental health treatment. The strategy recognises that an appropriate intervention approach encompasses intervention at various areas of risk and protective factors: the individual, family, community and society level. Interestingly, one of the main goals of the strategy is to reduce drug use (along with many other specified mental disorders). The strategy, therefore, recognises that many of the risk and protective factors and social determinants for problematic drug use and for mental health difficulties are shared.

Included in the strategy are the following broad principles of general mental health promotion:

- creating supportive environments,
- strengthening community action,
- using the media to shape attitudes,
- developing personal skills,
- incorporating promotion, prevention and early intervention within mental health services,
- education and training on the promotion of general health, and
- research and evaluation.

Although the National Mental Health Strategy attempts to address many of the risk factors for drug problems, there is no evidence that describes the actual impact of this strategy, or of broad-based prevention programs in general, on levels of mental health problems or substance-related harm.

9.5.1 Depression prevention

Beyond Blue is an Australian Government funded initiative aimed at preventing depression, guided by the principles of the National Mental Health Strategy. The Beyond Blue Annual Report acknowledges that prevention programs aimed at

preventing drug-related harm may contribute to alleviating or preventing depression. A prevention program run by Beyond Blue, a school and community program in which elite athletes deliver depression awareness and guide young people into designing and implementing a community project, mentions 'drug awareness' as one community project topic.⁷⁹⁸ Overall, drug-related harm is only peripherally acknowledged and is not included as an index of the program's success. Therefore, it is not possible to adequately evaluate whether Beyond Blue will lead to reduced drug-related harm.

9.5.2 Suicide prevention

Suicide is widely understood to be a complex phenomenon caused by the interaction between biological, psychological, social and cultural factors.⁷⁹⁹ Factors contributing to both suicide risk and risk of drug-related harm include alienation, physical isolation and depression.⁴¹⁹ The Canterbury Suicide Project confirms the link between depression and suicide; over 60% of participants who made serious suicide attempts had been diagnosed with depression in the month prior, compared to less than 6% of controls.⁸⁰⁰ Beautrais, in her review of risk factors for youth suicide, reports that young people are on average 12 times more likely to commit suicide if they are diagnosed with an affective disorder, and 5.5 times more likely if they have a substance use disorder.⁸⁰¹ Subsequently, suicide prevention programs that aim to prevent depression by mental health promotion could conceivably impact upon both suicide rates and drug-related harms.⁸⁰² Many suicide prevention programs also include goals of reducing harmful drug use.⁸⁰³

The National Youth Suicide Prevention Strategy has been the basis for suicide prevention programs in Australia including parenting programs, school-based interventions, early intervention programs for higher-risk populations, promoting mental health, and reducing access to means of suicide.⁸⁰³ The strategy acknowledges that young people who use drugs are at higher risk of suicide but the resulting programs do not target the reduction of drug-related harm as a relevant index for evaluation. Thus, it is not possible to tease out any preventive effect of these initiatives upon drug-related harms. Nor is it possible to comment on the impact of this strategy on the prevention of suicide.

9.5.3 Treatment and co-morbidity

There is very little evidence on the best approaches to treatment for those with co-morbid disorders.^{376, 804} Cochrane reviews have identified that at present there is no evidence of superiority for any form of treatment in regard to co-morbid mental health and substance use problems.⁷⁸³ There is moderately strong evidence that co-morbid mental health problems and substance use problems exert multi-directional causality, that is, mental health problems are likely to worsen substance problems and vice versa.^{197, 797}

9.5.4 Summary—mental health promotion and prevention

Similar Foundations: Mental health promotion in the population rests on the same principle as broad-based prevention addressing drug-related harm: that of ameliorating the risk factors predisposing people to harmful drug use, which are largely a function of factors such as developmental risk factors, unemployment, socioeconomic disadvantage and traumatic backgrounds.⁴¹⁹

Treatment: There is a strong theoretical case that treating mental health problems is likely to be effective in reducing substance use, even in the absence of treatment for substance use problems. We did not, however, identify any direct evidence that treating mental health problems leads to a reduction in substance use.

Direction of influence: There is no evidence that mental health promotion programs reduce substance use in adults, or that reductions in rates of mental health problems have a positive impact on rates of substance use problems.⁷⁹⁶ Mental health promotion programs, as with drug use primary prevention, are largely aimed at children because the peak age of onset for both problems is late adolescence. The earlier chapter summarising risk and protective factors for drug use showed that in some cases, child mental health problems (particularly externalising problems) increased the risk of subsequent involvement in harmful drug use. We have also summarised evidence in earlier sections showing that early age tobacco and cannabis use contribute to the emergence of mental health problems later in life. The available evidence suggests that mental health investment should form one component in programs aiming to prevent early age or regular drug use in adolescence.

9.6 Community improvement

Community prevention initiatives have been developed to directly target drug use issues. These programs are considered in detail in Chapters 8 and 10. Community drug prevention programs are based in a broader body of work addressing community improvement. The literature in this field is categorised variously as community development, improvement, and prevention. Community prevention programs have typically involved a wide variety of initiatives encompassing all three of the National Drug Strategy categories of demand reduction, supply reduction and harm reduction. Programs include aims that encompass broad-based prevention and result in multi-faceted strategies. Community prevention initiatives largely focus on changing adult behaviour and the structural issues that support and maintain drug consumption.

The Stronger Families and Communities Strategy was launched by the Commonwealth Department of Family and Community Services in April 2000.⁸⁰⁵ The strategy's three main priorities were:

- early childhood development and the needs of families with young children,
- strengthening marriage and relationships, and
- balancing work and family.

Although none of these areas immediately addresses youth issues, one of the eight principles underlying the strategy is prevention and early intervention. The strategy makes clear that this involves helping families early on to prevent later problems such as domestic violence, youth suicide, homelessness and drug addiction. The Australian Government also set up the Youth Pathways Action Plan Taskforce in September 1999, with the goal of developing a five year plan to help young people make the transition to adulthood. As part of this plan, the Government is funding various programs, including the Strengthening and Supporting Families Coping With Illicit Drugs program and the Schools Drug Education Strategy. These broad investments in community strengthening are also reflected in State programs that have a similar focus. Although the contribution that community improvement initiatives make to reducing drug-related harm is unknown, there are theoretical reasons to expect they should enhance protective factors for positive child and youth development and, more generally, improve wellbeing.

9.7 Conclusions—broad-based prevention

Broad-based prevention strategies vary in their direct or indirect relevance to the prevention of drug-related harm. The developmental pathways framework, with its emphasis on reducing developmental risk factors and enhancing protective factors, is an important underlying framework that has the potential to improve coordination between crime prevention, mental health promotion and drug use prevention efforts. There are further synergies with drug policy in the efforts to implement brief interventions and screening in health and harm reduction frameworks within injury and crime prevention policies. The Protection and Risk Reduction Approach to prevention articulated within the present document has the potential to integrate these varying frameworks, providing an important basis for improving coordination between different prevention strategies. However, there are potential areas of conflict between different areas of policy, emphasising the need for good coordination. A closer link between research and service delivery has the potential to strengthen prevention policy by better defining strategy combinations that are effective in reducing drug-related harm.

PART 5

THE EVIDENCE BASE FOR PREVENTION II: SUPPLY, DEMAND AND HARM REDUCTION FOR ALL AGE GROUPS

CHAPTER 10: DEMAND REDUCTION

10.1 Summary

Reducing the demand for both licit and illicit drugs has been attempted through universal strategies such as mass media campaigns, selective strategies such as brief interventions by health care workers, and indicated strategies delivered by specialist treatment agencies. The evidence for both direct and indirect impacts of these various strategies on levels of risky drug use and harm, at the population level, is reviewed in this chapter.

From a population-wide perspective, the level of investment in effective treatment programs needs to be a key ingredient of comprehensive prevention policies. There is suggestive evidence for population-level impacts of methadone programs on local levels of crime, and of alcohol treatment on acute and chronic alcohol-caused health problems in the community. There is also a major opportunity to intervene with family members of individuals experiencing serious alcohol and other drug problems both because this can increase treatment effectiveness, and in order to minimise the inter-generational transmission of mental health and substance use problems. There is strong evidence for some forms of treatment of drug problems, particularly for the legal drugs (for example, nicotine replacement therapy for smoking, cognitive behavioural therapy for alcohol problems). There is also some evidence for the value of matching different treatment modalities to different types and intensities of drug problems. Thus, there is a clear potential for increasing the population-level impact of society's investment in treatment programs on levels of risky drug use and harm.

Strong evidence exists for the effectiveness of brief interventions delivered by primary health care workers for smoking and alcohol problems; providing a major opportunity to increase the uptake of these strategies and hence their overall impact on population levels of risk and harm. (And there is strong evidence for-del) The effectiveness of interventions by health care professionals to reduce maternal smoking during pregnancy is also based on strong evidence. There is a strong rationale for such programs for the health of both the mother and child, and for interventions for mothers who are engaging in risky alcohol and other drug use. Further research into the effectiveness of interventions to reduce and prevent drug use during pregnancy is recommended.

There is a growing body of international research into the effectiveness of interventions to reduce alcohol problems delivered at the community level. The evidence is quite strongly in support of those programs that effectively mobilise the community to support local structural policy change (for example, incentives for responsible beverage service on licensed premises). Limited investment has been made in the conduct of rigorously evaluated community-based interventions in Australia, whether directed at problems with licit or illicit drugs.

Interventions delivered in the workplace have an enormous potential to reduce risky drug use and actual harm, due to the ability to access subgroups at risk who would not otherwise seek specialist help. Interventions found to be effective in other settings (e.g. brief interventions in primary health care) have the potential to offer community benefits in the workplace but more Australian research is needed. There has been substantial investment in drug testing programs, especially in safety-sensitive work environments where there is a strong rationale for deterring the use of licit and illicit substances. More research is required into the effectiveness of drug testing in the workplace, especially where this includes risky use of alcohol.

More money has been invested in mass media campaigns on licit and illicit drug problems than perhaps any other intervention in Australia. Evidence for effectiveness of this type of intervention is strongest in relation to tobacco use, especially when campaigns accompany other structural policy changes such as increases in taxation. There is some evidence for the effectiveness of campaigns around the risks of alcohol use, again especially when these support other initiatives such as drink driving law-enforcement. It is recommended that a degree of investment in such a social marketing approach continues, utilising available evidence for best practice. Social

marketing strategies such as national drinking guidelines and standard drink labelling are also recommended on the basis that they facilitate other evidence-based strategies e.g. brief interventions for controlled drinking and road safety campaigns. Examples of effective media advocacy in Australia are provided.

There is a general need to investigate the effectiveness of the universal, selective and indicated strategies in special populations, Indigenous communities in particular.

Intervention	Tobacco	Alcohol	Illicit Drugs	Nature of evidence/Comments
Drug treatment	★★★	★★★	★★★	Strong evidence for nicotine replacement, alcohol treatment (stronger for some interventions than others) and methadone treatment; less for psychostimulants or cannabis
Health service reorientation				
Brief interventions	★★★	★★★	★	Highly cost-effective for tobacco and alcohol; evidence for impact on whole of community; positive results from an Australian intervention for cannabis use
Targeted approaches for pregnant women	★★	O	O	Programs can reduce smoking, low birth weight or pre-term birth
Workplace interventions				
Drug testing in workplace	NA	Ⓜ	Ⓜ	No well-controlled efficacy studies; ethical difficulties in low-risk environments
Pre-employment screening	NA	O	O	No well-controlled efficacy studies; ethical difficulties in low-risk environments
Testing in high-risk settings	NA	★	★	Breath testing for alcohol essential in very high-risk work (e.g. for pilots); urinalysis for illicit drugs advisable in similar occupations
Brief interventions	Ⓜ	Ⓜ	O	Many workplaces provide opportunity to intervene with high-risk groups (e.g. young males)
Community-based interventions				
Health promotion	★	★	Ⓜ	Evidence of good acceptability within host communities
Structural policy change	O	★★	O	Target youth alcohol access, liquor and drink-driving law enforcement
Social marketing	★★	★	Ⓜ	National campaigns reduce overall smoking prevalence; drinking behaviour change can be achieved but is difficult to sustain
National Drinking Guidelines and standard drink labelling	NA	★	NA	Should not be evaluated in isolation from other prevention strategies; monitoring awareness now incorporated into NDSHS
Sub-populations: generic interventions targeting all drug types				
Treatment for co-morbid mental health and substance use problems		Ⓜ		No direct evidence to support one form of treatment over another
Programs for Indigenous Australians		Ⓜ		Need for more research but this needs to be negotiated with Indigenous community-controlled organisations
Programs to reduce demand among the elderly		Ⓜ		Some literature addresses improved screening in health care settings and preventing benzodiazepine dependence
Treatment for the elderly		Ⓜ		Some evidence that late-onset drinkers are more likely to respond to treatment – supportive environment and social support networks important

Key:

- O Limited investigation
- ☒ Evidence is contra-indicative
- 📖 Warrants further research
- ★ Evidence for implementation
- ★★ Evidence for outcome effectiveness
- ★★★ Evidence for effective dissemination

10.2 Treatment responses to alcohol and other drug problems

This section explores the impact of treatment on drug use and drug-related harm as a generic approach, rather than the minutiae of different types of treatment. The literature base for this section is extensive, including reviews such as Cochrane and other systematic reviews.^{783, 804, 806–811} These reviews generally have a high degree of evidence, allowing assertions to be made about the role and nature of treatment.

Treatment is aimed primarily at people with problems related to drug dependence. It should be noted that most people who use both licit and illicit drugs (with the possible exception of smokers) are not dependent,^{804, 811} nor are many frequent users dependent.⁸⁰⁴ However, some doubt has been thrown on the extent of so-called ‘recreational’ heroin use, with most studies having recruitment difficulties.¹⁶⁶ Dependence captures the notion of a change from voluntary to involuntary use;⁸¹¹ although, as has been demonstrated, dependence exists upon a continuum of severity. In relation of alcohol, signs of mild dependence are evident in a significant number of the population of adult drinkers who are not in treatment.⁸¹²

‘Treatment’ is a generic term that covers a wide range of clinical interventions, including those that make contact with and engage users; those that detoxify; and those that manage the process of withdrawal from chronic drug use, pharmacological treatment and psychosocial treatment.⁸⁰⁴ Clearly, different approaches will have different levels and rates of success with different individuals and patterns of drug use, and variability is necessary to allow users to access a clinical intervention that is effective for them.

10.2.1 Tobacco—treatment for nicotine dependence

Summary: Evidence for effective dissemination ★★★

Nicotine replacement therapy (NRT) has been shown to be effective and the evidence is summarised in a Cochrane review. NRT—including patches, gums, and inhalable nicotine—is associated with a small but consistent and statistically significant increase in the likelihood of achieving abstinence, in contrast to controls.⁸¹³

10.2.2 Alcohol—treatment for alcohol problems and dependence

Summary: Evidence for effective dissemination ★★★

Treatment efficacy for alcohol use problems has often been judged primarily by subsequent consumption levels. In relation to alcohol (but not necessarily for other drugs), total level of consumption is an excellent predictor of the likelihood of harm.⁸⁰⁶ Ancillary measures of the extent of alcohol-related problems in domains such as family, work, relationships and health, have also been applied. Furthermore, moderate or controlled drinking outcomes have been examined, particularly in relation to drinkers with a lesser degree of alcohol dependence.⁸¹⁴

The literature base in regard to alcohol is very well developed, and alcohol treatment research in general is at the stage of determining best practice rather than attempting to determine if treatment can be effective.⁸⁰⁶ Using this criterion, there are many approaches to alcohol treatment with demonstrated effectiveness, and, equally, there are many that have failed to show evidence of effectiveness.⁸⁰⁶ Effective alcohol treatment options include: motivational interviewing, brief interventions, social skills training, community reinforcement approach, relapse prevention and some aversion therapies. The largest ever controlled study of different forms of treatment for alcohol problems was the US Project Match.⁸¹⁵ Positive results were obtained from each of the three main treatment modalities: motivational enhancement, supportive psychotherapy, and 12-Step Facilitation Therapy. There was little evidence of any advantage from any one of these modalities; nor was there much evidence of interaction effects such that some types of client did better with particular treatments. There was, however, evidence that more severely dependent drinkers with otherwise lower social supports did better with 12-Step Facilitation Therapy, which seeks to encourage

regular attendance at Alcoholics Anonymous (AA) meetings. AA is an enormous worldwide network of self-help groups to help alcoholics achieve abstinence. Treatments with no evidence of effectiveness include insight orientated psychotherapy, confrontational counselling, relaxation training, general 'alcoholism counselling', education and milieu therapy.⁸⁰⁶ Unfortunately, some of these approaches with little evidence of efficacy are very popular and widely used.

Pharmacotherapies for alcohol dependence include disulfiram, naltrexone and acamprostate. There is good evidence from treatment outcome reviews that the effectiveness of disulfiram is limited.⁸⁰⁶ On the other hand, naltrexone has been found to be effective in reducing alcohol craving and drinking days, and to help to stop the resumption of binge drinking.⁸⁰⁶ A systematic review of randomised controlled trials, from 1960 to 1993, found that acamprostate and naltrexone demonstrated both safety and efficacy in the long and intermediate term respectively.⁷⁸³

10.2.3 Treatment for illicit drug-related problems and dependence

Harm reduction approaches have become widely included in treatment for illicit drugs in addition to, or instead of, the traditional treatment goal of reduced or no use of drugs. Goals of treatment may include reduced drug use, reduced risk of infectious disease and improved physical and psychosocial functioning.⁸⁰⁴

It is important to note that expectations of a quick 'cure' are unrealistic.^{804, 811} Dependence is a chronic, relapsing condition requiring continuing care⁸¹¹ and treatment needs to be seen as a long-term proposition with the goals being improved care and containment of problems rather than unrealistic expectations of a complete cessation of problematic use.⁸⁰⁴

There are various treatments that are used for different types of illicit substance use problems.^{804, 806}

These include:

- pharmacotherapies, such as methadone, naltrexone, buprenorphine and dexamphetamine;
- detoxification approaches, such as inpatient withdrawal, tapered gradual withdrawal, home detoxification, ultra-rapid opioid detoxification;

- counselling approaches, including brief interventions, motivational interviewing, cognitive behavioural therapy, relapse prevention; and
- psychosocial interventions, including outreach programs, residential rehabilitation, housing assistance, and employment assistance.

The effectiveness of treatment varies considerably according to the type of: drug problem involved (patterns of consumption, user characteristics), drug involved, and treatment employed.^{804, 806} Dealing with dependence typically involves a consideration of both the physical and the psychosocial aspects of drug dependence.⁸⁰⁴ For example, it has been demonstrated that providing psychosocial services to methadone clients provides significantly better outcomes than providing methadone alone.⁸⁰⁴ There is also evidence from controlled trials that the provision of supplemental social services (medical screenings, housing assistance, parenting classes and employment services) improves treatment outcomes in adults being treated for substance abuse.⁸¹⁶ In a similar vein, the social functioning of the client being treated is a significant predictor of the outcome of treatment. Professionals who are opioid-dependent have a significantly better prognosis than unemployed, poorly educated people using lesser amounts of opiates.⁸¹¹ Similarly, lack of treatment success is associated with low socioeconomic status, co-morbid psychiatric conditions, and lack of family and social support.⁸¹¹ Taken together, these findings emphasise the importance of considering a broad range of social factors in responding to drug-related problems. It should also be noted that there is a low level of access to treatment among illicit drug users in the criminal justice system: between 40 to 60% of DUMA 2001 respondents²³⁸ and 55% of DUCCO respondents³⁷⁹ had never been in treatment.

Opioids

Summary: Evidence for effective dissemination ★ ★ ★

The strongest evidence for the efficacy of illicit drug use treatment is found in the treatment of opioid dependence. Methadone maintenance therapy (MMT) has proven effectiveness in: retention in treatment, reductions in drug use, criminal behaviour, mortality, and improvement in health status, when adequate doses (> 60 mg/day) are given. Effectiveness is improved when treatment also addresses psychosocial issues.⁸⁰⁴ MMT is also associated with a reduced risk of HIV infection.⁸⁰⁴

Other opioid substitutions that are less well researched than MMT but appear to be efficacious are buprenorphine and LAAM.⁸⁰⁴ There is less evidence in favour of naltrexone.⁸⁰⁴ Detoxification and withdrawal from opioids without other treatment is not effective and relapse into use is common.⁸⁰⁴

Treatment in general, is associated with significant savings from the costs of crime. Extensive UK multi-site studies of treatment effectiveness reported an average reduction in total crime costs of £12 000 per annum per participant.⁸¹⁷ It was further estimated that for every pound spent on treatment, £3 savings from crime and criminal justice system costs was returned.

Psychostimulants

Summary: Evidence for outcome effectiveness ★★

Pharmacological therapies for psychostimulants are widely researched, mainly in the US for cocaine dependency, but no broadly effective pharmacological therapy has been identified.⁸⁰⁴

There appears to be no review literature, as yet, on the use of dexamphetamine as a substitute for ATS dependence but an Australian feasibility study concluded that a multi-site randomised controlled trial of the efficacy of amphetamine substitution therapy should be undertaken before the practice became too widely available.⁸¹⁸ Other treatments for psychostimulants include cognitive behaviour therapy, which has been found in one randomised controlled trial to be effective in moderating cocaine use, and contingency management approaches, which have also been found to be effective in reducing cocaine use.⁸⁰⁴ Again, detoxification alone is not effective.⁸⁰⁴

Cannabis

Summary: Treating cannabis dependence; evidence for outcome effectiveness ★★
Brief interventions for illicit drug use; evidence for implementation ★

There are few systematically developed treatments for cannabis dependence.⁸¹⁹ Some of the cannabis interventions have been adaptations of treatment approaches developed for alcohol, based on the premise that cannabis dependence is directly comparable to alcohol dependence.^{820, 821} The majority of the cannabis treatment packages that have been subject to evaluation are cognitive-behavioural in orientation. A 12-step treatment approach for cannabis dependence has been proposed,⁸²² although its efficacy has not been reported. A small number of self-help manuals have

been developed, some with an abstinence focus,⁸²³ some that handle both abstinence and non-abstinence goals,⁸²⁴ and some that focus on harm reduction with less emphasis on strategies for changing cannabis consumption.⁸²⁵ Such materials may include suggestions on managing withdrawal, removing cues to smoking, self-monitoring, development of alternative responses and relapse prevention. As yet, none have been systematically evaluated although some have been developed with extensive piloting and feedback from experts and users.⁸²⁶

A comprehensive review of treatment concludes that there is insufficient evidence to demonstrate conclusively that most treatment approaches are effective. Cognitive-behavioural therapy appears to show the most promise. Brief interventions may be more cost-effective than extended group counselling efforts.⁸⁰⁴

10.2.4 Treatment for co-morbid mental health and substance use problems

Definition: Treatment programs designed acknowledging that there is considerable co-morbidity between drug use disorders and other mental disorders, particularly anxiety and affective disorders.

Summary: Warrants further research 📖

The issue of treatment for co-morbidity remains a complex and debated area. A systematic review by The Cochrane/Campbell Collaborations reported that there is, at present, no direct evidence to support the notion that any one form of treatment is better for people with co-morbid mental health and substance use problems; this includes the current push towards integrated treatment.⁷⁸³ Gowing *et al.* note that most controlled trials of treatment efficacy specifically exclude people with co-morbid mental health problems.⁸⁰⁴ Others note that co-morbidity is typically associated with a poorer treatment outcome.⁸¹¹ Given evidence that there is often a two-way causal relationship between substance use and mental health problems, especially mood disorders, there is a very strong rationale for combined approaches. Clearly, the nature of such interventions will need to be tailored to particular types and severities of presentation, both for the mental health and the substance use dimension. There has been an Australian trial of brief intervention for alcohol and drug use for persons attending a psychiatric ward of a major general hospital.⁸²⁷ Screening of admissions for risky alcohol and drug use took place and patients were then randomly assigned to either a session of

motivational interviewing or given a booklet. In practice, the number of patients recruited for the study was too small for meaningful analysis.

10.2.5 Treatment for the elderly

Summary: Warrants further research 

The issue of treatment for elderly populations has generally not been well addressed. There have been calls for an 'elderly specific' approach to elderly alcohol problems, since at least 1987.²⁵⁸ Alcohol treatment effectiveness does not seem to vary significantly between elderly and younger populations²⁵⁸ although there is some evidence that late-onset drinkers are more likely to respond to treatment than early-onset drinkers.²⁵⁸ The predominance of depression, grief and social isolation as antecedents to problem drinking suggests that specific strategies addressing these issues may be required.²⁵⁸ Similarly, some have argued that treatment must focus on day-to-day issues such as loneliness, loss of independence and declining health.²⁵⁹ Such treatment has involved addressing strategies to cope with negative emotional states, dealing with drinking cues, and increasing social support.²⁵⁸ There is some evidence that a supportive environment and social support networks are factors in improvement following treatment.²⁵⁸

10.2.6 Impact of treatment at the population level

The impact of treatment on harms at the population level is more difficult to assess in relation to illicit drugs than in relation to alcohol treatment. There are clear indications that MMT can reduce HIV risk behaviour⁸²⁸ and local levels of criminal behaviour such as burglary.⁸⁰⁴ The experience in Switzerland with heroin prescription has shown that effective opiate treatment can reduce the level of opiate overdose in the community.⁸²⁹ The Director of the National Drug and Alcohol Research Centre notes that if there are approximately 100 000 opiate dependent people in Australia, then having about one-third of them in treatment in opiate replacement therapy is a good public and population health measure (Mattick, personal communication). The potential for reducing crime at the local community level through treatment is highlighted by a careful UK study of the average annual costs of crime per illicit drug user in the 12 months prior to their admission to treatment, roughly AU\$45 000.⁸¹⁷ This study estimated that, on average, two-thirds of these costs are saved per treated individual per year.

Some authors have argued that, given that most of the population-level harms from alcohol use occur in non-dependent alcohol users (the so-called prevention paradox), treatment will be of little use in preventing population-level problems with health, safety and public order. However, there is also some evidence that programs targeting high-risk and dependent drinkers do, in fact, exert a beneficial effect on aggregate-level harms in the wider population.⁸³⁰ Thus, while the prevention paradox may well apply in relation to most alcohol-related harms, this literature suggests that treatment may engage and benefit enough high-risk and dependent drinkers to make a difference at the aggregate level. The example of a mass screening and early intervention project in Malmo, Sweden, for early signs of alcoholic liver damage was also indicative of the potential of secondary prevention programs to impact at the population level.⁸³¹ There is still the confronting truth, however, that most treatment programs typically engage only a small proportion of people with drug- and alcohol-related problems and dependence. Even if one includes advice from a general practitioner (GP), only one in three people with an alcohol problem will receive any kind of treatment from a health care professional in a 12 month period.⁸³²

10.2.7 Research needs

There are some major gaps in the literature at present. Some authors have identified a complete lack of information on best practice in illicit drug treatment for groups with specific needs, namely Indigenous people, young people, prison inmates and poly-drug users.⁸⁰⁴ There is also little information on effective treatment options for people with psychostimulant problems, particularly in relation to ATS, since the existing literature deals largely with American cocaine research.⁸⁰⁴ Overall, while alcohol, cocaine and opiate treatments are well researched, best practice in treatment in regard to other illicit drugs is not well established.⁸⁰⁷

There is also a gap in relation to the low uptake of treatment by some culturally and linguistically diverse groups. There are Australian reports that heroin users from an Asian or Middle Eastern background are less likely to enter into MMT.⁸³³ A report by the Victorian Department of Human Services attempted to identify best practice in providing drug and alcohol treatment to young people of Cambodian, Lao, and Vietnamese origin.⁸⁰⁹ Various strategies were recommended, including improved cultural awareness, recognition of culture-specific needs, collaborative effort, family support and flexible outreach services. However, no

direct evidence was provided that addressing these issues has resulted in either improved service uptake or improved service outcome. This is a clear gap in the literature. Some ethnic groups have low uptake of treatment services, but the reasons why, or strategies that may address this problem, have not been addressed in the literature.

10.2.8 The economic benefits of providing treatment

One of the largest and most rigorous economic evaluations, to date, is the CALDATA study based in California.⁸³⁴ A study of 3000 alcohol and drug dependent participants under differing modes of care showed treatment to yield a 7:1 return on each dollar spent. Most of these benefits were obtained from decreased levels of crime. In this study, gains at one year after treatment more than doubled the gains made during treatment (although patients discharged from the methadone programs also included in the evaluation had relapsed and had a negative benefit-cost Ratio [BCR]).

A longitudinal survey of drug users in the Treatment Outcome Prospective Study (TOPS) found that after treatment, drug users impose lower rates of crime-related costs on society but they did not earn significantly higher wages.⁸³⁵ The BCR for the TOPS methadone treatment program was found to be 4:1. Subsequent studies have found lower BCRs for outpatient treatment but when gains from legitimate employment are included, they improved to 4.3:1.

With regard to alcohol treatment, there is also longitudinal research demonstrating a 24% reduction in health costs for treated alcoholics versus untreated alcoholics, over a 15 year follow-up period.⁸⁰⁶

Standard substance abuse treatments have been considered to be very successful, yet at the same time, their effectiveness is frequently challenged. This paradox is due to the fact that various programs produce multiple outcomes, which can be valued differently depending on the point of view of the evaluation. Outcomes such as abstinence, reduced drug use, delayed use, harm reduction, etc. are commonly cited but may conflict when trying to make comparisons between programs. It has generally been proven that investment in the more high-risk treatment groups shows the highest returns, especially if treatment can be non-residentially based.

10.2.9 Conclusions

There is a strong consensus within systematic reviews that treatment programs for alcohol and other drug problems can be effective against a broad range of indicators including levels of use, health and wellbeing. There is a substantial evidence base from major multi-centre studies with extensive long-term follow-up and rigorous methodology that treatment is associated with reduced drug use, improved health (mental and physical), improved social functioning and reductions in crime.⁸³⁶ However, not all treatments work equally well.⁸⁰⁶ Different drug problems necessitate different approaches⁸⁰⁴ and some areas of treatment are more amenable to rigorous assessment of effectiveness than others.⁸⁰⁴ Detailed investigation of this issue can be found elsewhere.^{804, 806}

10.3 Health service reorientation—brief interventions

10.3.1 Smoking cessation for pregnant women

Summary: Evidence for outcome effectiveness ★★

A Cochrane review of smoking cessation programs for pregnant women concluded that such programs reduced smoking, low birth weight and pre-term birth; but no effect was detected for perinatal mortality. A systematic review of prenatal counselling on tobacco use showed that counselling can reduce the incidence of low birth weight.⁴⁶⁸

10.3.2 Brief interventions in primary health care for smoking and alcohol problems

Summary: Evidence for effective dissemination ★★★

Brief interventions by primary care practitioners for both smoking and early stage alcohol problems feature in a strong literature, based on systematic reviews and meta-analysis, that demonstrates their effectiveness.⁷⁸³ While the increase in the number of people reducing their consumption in response to brief interventions is small, this increase is highly consistent across numerous different studies. Given that brief intervention is inexpensive, takes very little time, and can be implemented by a wide range of health and welfare professionals, this is a highly cost-effective strategy with considerable potential for harm reduction from a wholesale application of the method. A recent evidence-based review of these programs found that compared to a control

group who received no treatment, 10% more people in the intervention group ceased or lowered their alcohol intake to a risk-free level.⁸³⁷ In a controlled study of mass screening and brief intervention with follow-up, for men in Malmö, Sweden, there was a significant decline in hospital admissions and mortality in the treated group over a four year follow-up period.⁸³¹ An 80% reduction in absenteeism in the four years following the study, a 60% reduction in total hospital days over five years, and a 50% reduction in all cause mortality over six years was reported.⁸³¹ These are substantial changes from a brief low-cost intervention that had a wide implementation in the host community and are comparable to the GP driven Quit for Life anti-smoking program in Australia that has been shown to be highly cost-effective.⁸³⁸

10.4 Community-based prevention programs

Definition: The community is a catchment area that is targeted with health promotion messages to reduce drug-related harm. Community interventions focus on structural policy change, with prevention programs that aim to achieve policy, legislation and practice change, to indirectly influence alcohol and tobacco consumption in the community.

Summary: Health promotion community-based interventions; evidence for implementation ★
Community interventions focused on structural policy change; evidence for outcome effectiveness ★★

In recent years, there has been increasing interest in community-based prevention programs because of the emerging understanding of how environmental and social conditions contribute to alcohol and other drug problems. Most of these research-driven prevention programs have focused on alcohol and tobacco because the influence mechanisms and outcome measures can best deal with open and prevalent behaviour. What can be identified from several decades of practice are two complementary prevention approaches.⁸³⁹ In one approach, the community is a catchment area which can be targeted with health promotion messages designed to directly change the way individuals use tobacco and alcohol. In the other approach, prevention programs aim to achieve policy, legislation and practice change in order to indirectly influence alcohol and tobacco consumption in the community.⁸³⁹ Not surprisingly, a number of recent prevention approaches have combined these two features in comprehensive community prevention programs.

The New Zealand Community Action Project (CAP) was conducted in six cities over a two and a half year period.⁸⁴⁰ It comprised two main components: a multimedia campaign designed to encourage males to drink moderately, and the use of community organisers to stimulate local discussion of alcohol policy issues. The program's main impact was to curb an existing trend of increasingly liberal attitudes towards alcohol. Another community-based program, the Rhode Island Alcohol Abuse and Injury Prevention Project, involved community mobilisation, training in responsible beverage service and enforcement of laws relating to alcohol.^{841, 842} This intervention appeared to reduce emergency room injury visits, assault, head injury and motor vehicle crash injuries⁸⁴³ but had a number of methodological limitations.⁸⁴⁴

Community alcohol programs ideally consist of an organised, planned, community-wide intervention, whereby a wide range of stakeholder agencies such as police, health services, drug agencies and local businesses get together and implement a range of complementary interventions. The interventions are implemented systematically (e.g. community input into local licensing regulations, media awareness campaigns, police action on drink-driving, responsible service policies) as part of a broad intervention aimed at changing the way the community defines normative patterns and levels of consumption, and responds to problems of use. An Australian example of this was provided by the Christmas Collaborative Campaign, which was undertaken by a coalition of virtually all relevant stakeholders in the Western Australian town of Carnarvon, as a way of reducing alcohol harm during the high-risk period leading to Christmas.⁸⁴⁵ This campaign comprised a number of complementary initiatives involving media messages, promotion of responsible drinking in licensed premises and structural changes to reduce risk. Local data indicated a reduction in harm as compared to the previous year, including a reduction in road crashes.

Aguirre-Molina and Gorman, in a comprehensive review of community-based drug prevention programs, found that programs with the greatest promise: relied heavily on community action as the means of achieving change; sought to empower the community through involvement in all decision making; were comprehensive in terms of targets and strategies; drew on the public health model to identify factors other than the individual as causing problems; and drew on the best available research to guide interventions.⁸⁴⁶ Cochrane reviews of broader

health behaviour have reinforced these findings from community alcohol programs. These reviews have shown that all community-based programs aimed at changing health risk behaviour are more effective in causing positive behavioural changes when the program involves extensive, multiple interventions in a variety of settings and contexts.⁷⁸³

While broad community-based initiatives have been heralded in recent years as offering better prevention possibilities than single element, individual-focused strategies, this enthusiasm needs to be tempered with an appreciation of what has actually been achieved. Gorman and Speer identified only eight well-designed community alcohol interventions that sought to change population knowledge, attitude or behaviour.⁸⁴⁷ The majority of these studies reported minimal program effects, which seemed to be due to difficulties in generating community involvement and an inability to influence community processes. The programs that reported most success had circumscribed objectives such as reducing drinking and driving, or limiting alcohol use in specific locations. A recent well-controlled quasi-experimental study from Stockholm, Sweden,⁸⁴⁸ focused on responsible beverage service on licensed premises, with a combination of community mobilisation, training of bar staff and stricter enforcement of liquor laws. A substantial and significant drop in violent crime occurred in the intervention sites. This intervention clearly straddles the boundaries between community action and supply control. It also supports the idea of having defined objectives and including community mobilisation strategies to support community employees such as police, in implementing what may be controversial prevention strategies.

The largest and most methodologically rigorous community alcohol prevention program was the Community Trials Project (CTP) conducted by Holder and his colleagues in six locations in California and South Carolina, over a five year period.⁷²⁷ This project aimed to reduce harms associated with drinking, rather than drinking itself, and comprised five interacting components: community mobilisation; responsible beverage service; reduction of drinking and driving; reduction of underage drinking; and reduction of access to alcohol. Holder has emphasised the importance of using community action to achieve policy and structural changes that can have a sustainable impact on future levels of harm. The CTP had particular emphasis on enforcement of liquor laws regarding service to intoxicated and underage drinkers, as well as utilising opportunities

for local controls on alcohol availability. The CTP was successful on a number of measures including: the reduction of alcohol-involved motor vehicle accidents, rates of alcohol-related violence, significant community support for the interventions, an increase in media coverage of alcohol-related trauma and prevention policy initiatives, and reductions in sales of alcoholic beverages to underage decoys.⁸³⁹ However, this success needs to be measured against the cost of the project, which was considerable. Holder and his colleagues noted that over a four year period, the cost of local community staff in one intervention community was US\$360 000 and this did not take into account evaluation costs or expenses associated with intervention activities.⁸⁴⁹ Such comprehensive, well-resourced, long-term community projects have the greatest chance of achieving meaningful change but this level of funding would be difficult to obtain on a routine basis. However, it should be noted that on the basis of only one of the above outcome measures, a net reduction of 78 alcohol-related traffic crashes in the intervention communities resulted in estimated savings of US\$3 112 590.

The Community Mobilisation for the Prevention of Alcohol-Related Injury (COMPARI) was an Australian demonstration project designed to show that alcohol-related injury could be reduced by mobilising a whole community to take an active role in changing individual drinking behaviour and the environmental factors that influence alcohol-related harm.⁸⁵⁰ The project operated over a three year period in the Western Australian regional city of Geraldton and during this period undertook 22 major component activities involving: community development, local networking and support, provision of alternative activities, health education, health marketing and policy institutionalisation. Many of the individual activities conducted by COMPARI resulted in changes in community knowledge and behaviour. For example, the designated driver intervention for young adults, known as Pick-a-Skipper succeeded in persuading young drinkers to select non-drinking drivers as 'skippers' before they began consuming alcohol.⁸⁵¹ While the project was sufficiently successful to become the major alcohol and drug service provider for the region, there was limited measurable impact on overall levels of harm.

In one of the most recent reviews of the research on community prevention approaches to alcohol, Casswell identified the following common themes:⁸⁵²

- projects must be community driven,

- traditional experimental designs may limit the community dynamic,
- successful projects incorporate a process of reciprocal and respectful communication between different community sectors and between the community and the researchers,
- social capital is needed for effective community action,
- financial capital is also critically important.

Sufficient time for development of the intervention, measurement of change and institutionalisation of practice, has also been identified as an issue by a number of researchers.^{727, 849, 850} If community prevention programs are to reflect these elements of best practice, they will be complex, expensive and long-term. However, Casswell considered a number of community prevention studies have shown that community mobilisation can create changes in the norms about alcohol use and alcohol harm and, as a result, can facilitate structural change within the community that has a direct impact on harm.⁸⁵² The Aguirre-Molina and Gorman⁸⁴⁶ and the successful Stockholm study,⁸⁴⁸ however, also suggest that community mobilisation on its own will not be effective unless it is focused on a specific structural change process (e.g. encouraging more responsible service of alcohol in public places). If research understanding of community prevention approaches to alcohol is to be meaningfully advanced in Australia, a research project tailored for local circumstances, but of similar scale to the American CTP, should be undertaken in this country. In this way, community prevention approaches that are best suited to the Australian cultural context can be identified.

10.4.1 Illicit drug community interventions

Definition: Community groups engaged in a range of activities designed to prevent or reduce illicit drug use in their community.

Summary: Warrants further research 

Although most of the community literature deals with alcohol and tobacco programs, there is growing interest in programs targeting illicit drugs. Community groups interested in local drug problems have operated in WA since 1997 and have spread throughout NSW since 2000. In Victoria, local councils have initiated community networks in response to local drug concerns. These structures, which involve local citizens, are based on the idea that since drugs are a community problem the

community should be part of the solution. The Government provides some financial support, advice when requested, and assists with a monitoring and reporting framework. However, because grassroots involvement is critical, parents, local residents, young people, local businesses, police, local government, schools, youth services and community groups are usually all represented. Activities organised by these groups include support services, employment, recreation and monitoring youth parties.⁸⁵³ This approach offers considerable promise but at this early stage evaluation is limited to anecdotal reports.^{236, 854}

The Community Partnerships Initiative (CPI) has been developed by the National Illicit Drugs Strategy (NIDS) within the Commonwealth Department of Health and Ageing. Its purpose is to contribute to the prevention and reduction of young people's illicit substance use by mobilising communities and fostering relationships between government and the broader community. This is pursued primarily by funding community groups to undertake preventive projects. The anticipated outcomes are as follows: the development of an Australian community partnerships model for primary prevention of illicit substance use; a benchmark of quality practice in community participation and action on a significant public health issue; an increase in the capacity of communities to develop effective prevention activity; national dissemination of quality practice in primary prevention of illicit substance abuse utilising various forms of media; and an increase in self-sustainable community action across Australia. The National Drug Research Institute was funded to evaluate the CPI over the first two funding rounds.⁸⁵⁵

The heart of the CPI is the funding of community-based projects. Funding is provided on a one-off basis for a period of up to two years, with projects receiving between \$5 000 and \$211 000. To date, 24 projects were funded under the first round to a total value of \$1.9 million, 63 organisations were funded under the second funding round to a total value of \$3.98 million, and 23 organisations were funded under the third round to a total value of \$1.7 million. A fourth funding round has commenced. Projects include: community development; training schemes; peer education; information dissemination; and resource production initiatives in rural and remote, regional, metropolitan and suburban settings.

In the evaluation, projects have been categorised according to the major activities planned, or themes developed, in the construction of the project. The

categories emerged from a literature review as follows.

- **Knowledge, attitudes and values (KAV)** approaches can be defined as those that seek to increase young people's awareness about illicit drugs while changing their values and attitudes through examination of personal needs, values and decision making patterns.⁸⁵⁶ KAV approaches form the most common approach in the CPI. Thirty-five projects (10 in the first round and 26 in the second) incorporated elements of this approach. Whilst there is little literature available on the efficacy of a KAV approach in a community-based setting, school-based programs show that programs that combine these elements are more successful than programs that focus on just one or two elements.⁸⁵⁶
- **Peer-based approaches** incorporate the teaching or sharing of information, values and behaviours by members of similar age or status group.⁸⁵⁷ Peer-based approaches were well represented amongst CPI projects, with 29 projects (10 in the first round and 19 in the second) containing elements of this. The literature review noted that there is no clear evidence linking peer-based prevention programs to behaviour change, although these are very popular.
- **Alternatives approaches** can take the form of basic life skills, job preparation, recreational activities and physical adventure programs.⁸⁵⁶ They are designed to increase personal competence and promote an individual's sense of control.⁸⁵⁶ Sixteen CPI projects (3 in the first round and 13 in the second) offered alternatives to illicit drug use such as recreational, sporting, employment and other activities. They were found to be the most effective type of program for fostering behaviour change in one systematic review.⁸⁵⁶
- **Community action approaches** seek to achieve the representation and active involvement of community sectors that are perceived to be of influence in preventing illicit drug use by young people.⁸⁵⁸ As noted above, local community involvement is a critical factor in local prevention programs. Twenty CPI projects (6 in the first round and 14 in the second) sought to foster community action in order to prevent illicit drug use amongst young people in their community. These community actions included establishing community-based advisory groups and developing community forums and action plans.

- **Parent-based approaches:** nineteen programs (4 in the first round and 15 in the second) aimed to provide information and/or support for parents of young people who are using, or are at risk of using, illicit drugs.
- **Broad-based approaches** were defined as those that incorporated more than one of the above. Broad-based approaches were relatively common in CPI projects—24 projects (7 in the first round and 17 in the second round) took an approach to primary prevention that incorporated one or more approaches. Knowledge and/or affective approach components were present in 18 of the broad-based projects. The most common combination was knowledge and/or affective and community action approaches (5 projects).

One immediate conclusion from this analysis is that there is a significant gap between practice and the evidence base in this area.

10.5 Programs in Indigenous communities

Definition: In principle, mainstream substance misuse services are available to Indigenous Australians. In practice, these are often unaffordable, inaccessible, inappropriate and unacceptable. There have been attempts by mainstream service providers to address these problems. However, in response to these problems, the level of substance misuse within their communities, and as an expression of self-determination, Indigenous Australians themselves have developed a broad range of intervention initiatives.

Summary: Warrants further research 

Arrangements to address Indigenous substance misuse, as in other areas of Indigenous health, are complex. Although Commonwealth, State and Territory substance misuse policy is partly coordinated through the Ministerial Council on Drug Strategy (MCDS) and the National Drug Strategy,¹³ at the time of writing there is no national Indigenous substance misuse policy. However, a Reference Group for Aboriginal and Torres Strait Islander Peoples provides advice to the Intergovernmental Committee on Drugs (which is responsible to the MCDS) and its various national expert advisory committees. This Reference Group gives Indigenous people formal input into national substance misuse policy for the first time, and is currently overseeing the development of a Complementary Strategy to Address Substance Misuse among Aboriginal and Torres Strait Islander People.

Arrangements to address Indigenous substance misuse also include numerous pieces of Commonwealth, State and Territory legislation that control the availability of alcohol and other drugs. These pieces of legislation do not generally address substance misuse among Indigenous people. However, to varying degrees, some—such as liquor licensing laws—provide communities in general, or Indigenous communities in particular, with a voice and opportunity for action on these issues.

Substance misuse prevention services for Indigenous people are provided by State and Territory Government agencies, Indigenous community-controlled substance misuse and health service organisations, and to a lesser extent, non-Indigenous controlled non-government organisations. The Commonwealth Government does not have a direct role in the provision of services but plays a key role in the funding of State/Territory and Indigenous community-controlled intervention services. In fact, in the 1999/2000 financial year, the Commonwealth provided 58% of funds for projects specifically targeting Indigenous people with substance misuse problems, as well as providing significant amounts of funding for Indigenous community-controlled primary health care services.⁸⁵⁹ In addition to providing direct services, individual community-controlled organisations and umbrella organisations, such as the National Aboriginal Community Controlled Health Organisation and the recently formed National Indigenous Substance Misuse Council, play an important advocacy role.

Demand reduction strategies among Indigenous Australians have focused on treatment and health promotion, and—to a lesser extent—providing alternatives to substance misuse use. In addition, both explicitly and implicitly, various community development projects have the prevention of substance misuse as a goal.

10.5.1 Treatment

The 1994 NDSHS-UATSIPS found that most people who had sought treatment had done so in primary health or medical care settings: either from Indigenous community-controlled health services or general practitioners.²⁶⁹ As well as treatment—under their objective of providing comprehensive primary health care—the various Indigenous community-controlled health services also provide a range of early intervention, prevention and support services. Indigenous community-controlled health services also undertake about a quarter of the substance misuse specific projects discussed under different categories below.⁸⁵⁹

On the basis of reports by Indigenous people about the role of advice from medical practitioners in their decisions to give up drinking alcohol, and their effectiveness in other populations, Brady—among others—has been an advocate of brief interventions for Indigenous people.^{326, 860, 861} Despite there being no evaluation of the efficacy of such interventions among Indigenous Australians, given their effectiveness elsewhere they should probably be used by health care providers as the opportunity presents. More broadly, Hunter, Brady and Hall have prepared a comprehensive set of recommendations for the clinical management of alcohol-related problems in Indigenous primary care settings.⁸⁶² Also, a book edited by Couzos and Murray for the Kimberley Aboriginal Medical Services Council provides guidelines for educating and counselling Indigenous patients with alcohol and tobacco problems and for addressing these problems in the context of other health problems.⁸⁶³

Apart from general primary care interventions, focused treatment projects are the most common form of intervention in Indigenous communities. In 1999/2000, there were 107 treatment projects conducted in both residential and non-residential settings.⁸⁵⁹ The majority of these targeted alcohol alone or alcohol and some combination of other substances. Although many treatment projects are based on the '12-step' model—or an adaptation of it—in recent years services have begun to explore a wider range of approaches, including life skills counselling and vocational training.

Evaluations of alcohol treatment projects have found that some produced no significant outcomes, whilst others experienced moderate degrees of success.^{864–869} In one case, such results were reported to be a consequence of the fact that there were no agreed criteria against which success could be measured.⁸⁶⁶ In others, project effectiveness was circumscribed by limited resources and the need for additional training for both clinical and administrative staff.⁸⁶⁷

In the case of petrol sniffing, d'Abbs and MacLean reported that the results of the Healthy Aboriginal Life Team (HALT) project conducted in Central Australia showed that '... in the hands of a skilled counsellor, orthodox counselling ... can be effective if used with sensitivity and respect for Aboriginal perceptions and values' (p vii).²³³

An important gap in the provision of treatment services—especially given the practical problems associated with home detoxification in Indigenous communities—is the limited number of detoxification facilities. The lack of detoxification services is particularly acute for those who inject

drugs;^{175, 870} and staff from services focusing primarily on alcohol-related problems report that they often do not have the training to deal effectively with illicit drug-related problems.²⁸⁵

10.5.2 Prevention

In 1999/2000, prevention projects (in the more narrow use of the term) comprised only 21% of all Indigenous intervention projects and received less than 10% of funds directly targeted at reducing Indigenous substance misuse. Furthermore, 47% of these received only short-term funding.⁸⁵⁹ Along with other intervention projects, a list of current health promotion projects is available on the *Indigenous Australian Alcohol and Other Drugs Database* (<http://www.db.ndri.curtin.edu.au>), and overviews of the range of projects are available for tobacco,⁴⁶⁸ alcohol⁸⁷¹ and petrol sniffing.²³³

A small number of, largely qualitative, evaluations of projects targeted at alcohol have been undertaken. The projects included: provision of health education classes, sporting and recreational activities, and support for homeless people;⁸⁷² a bush tour by the band Yothu Yindi and an associated television commercial;⁸⁷³ alcohol education and related programs for young people;^{874–876} and community education and activities.^{867, 868} As with treatment projects, whilst most were well received by the communities in which they were conducted, the outcomes of these interventions were equivocal. These evaluations also identified a number of process issues that either enhanced or constrained project effectiveness. In particular, they emphasised the need for adequate resourcing and the provision of staff training and support.⁸⁶⁹

In her literature review of Indigenous Australians and tobacco, Ivers identified a small number of interventions specifically targeted at Indigenous people on which published information is available.⁴⁶⁸ These included development of resources and radio advertisements as part of the Western Australian Quit Campaign;⁸⁷⁷ the Jabby don't smoke project⁸⁷⁸ and the Yamatji smoking prevention project⁸⁷⁹ (both of which were also conducted in Western Australia); and the Maningrida be smoke free project⁸⁸⁰ in the Northern Territory. As Ivers indicates, none of these projects have been formally evaluated. However, some groups have compiled or developed guidelines for use in the development of smoking intervention projects.^{881–883}

As indicated previously, prevention of the use of illicit drugs among Indigenous Australians is a

relatively recent phenomenon. In 1999/2000, the only prevention projects concerning illicit drugs were four that targeted cannabis use as part of broad-based prevention efforts—none of which have published evaluation reports available. Given the growing use of illicit drugs, there is clearly a need for the development of more intervention projects in this area.

Petrol sniffing intervention projects have focused on youth work,⁸⁸⁴ recreational activities,^{885, 886} general education,⁸⁸⁷ employment,⁸⁸⁸ and substance specific education.⁸⁸⁹ The number of projects specifically targeting volatile substance misuse is relatively small—with six operating in the 1999/2000 financial year. A review of petrol sniffing intervention projects has been undertaken by d'Abbs and MacLean.²³³ Based on the limited evidence available, they suggested that—subject to some caveats—a number of these interventions appear to be effective. However, they concluded that:

The most effective long-term strategies against petrol-sniffing are likely to be those which broadly improve the health and well-being of young Aboriginal people, their families and communities (p viii).²³³

10.6 Programs to reduce demand among the elderly

Summary: Warrants further research 

There is little evidence available on effective prevention strategies in elderly populations. Most reviewed publications cited earlier mention the importance of ensuring that health care staff are aware of the issue of alcohol-related problems in the elderly and are skilled in their detection. As discussed, detecting alcohol problems can be difficult, and there is a reasonable body of literature addressing approaches for improved screening in health care settings.²⁶²

WHO recommend prescribing benzodiazepines cautiously to older populations, and to choose shorter duration benzodiazepines because they are less likely to accumulate in the blood, which increases the risk of harmful side effects.²⁰³ Kirby et al. suggest that the continued prescription of long-acting benzodiazepines may reflect a greater familiarity with the older longer lasting drugs, lack of awareness of the greater risks of using this kind of benzodiazepine, and the perception that alternatives with shorter half-life are not as effective.⁸⁹⁰ Preventing harmful benzodiazepine use may involve addressing these issues with doctors

and patients, as well as promoting alternative treatments for insomnia, depression and anxiety among older Australians.

10.7 Workplace programs

There are two major rationales for alcohol and other drug interventions in the workplace: to improve productivity, and to improve workplace safety.^{404, 405} Other proposed benefits include improved public relations due to public perception that companies are acting to reduce drug problems and improve safety in the workplace.⁸⁹¹ However, developing workplace programs is complex and requires consideration of health, ethical, legal and industrial relations issues. Little is known about the actual preventive impact of different interventions.^{404, 405}

10.7.1 Occupational health and safety issues

In the Australian context, approaches to workplace drug problems are strongly influenced by Occupational Health and Safety legislation and industrial relations issues. Implementation of prevention policy cannot be considered in isolation from these issues.

It is clearly established, in general terms, that Australian employers are legally obliged to take all due precautions to reduce the risk of any potential safety hazards in the workplace.^{892, 893} Based on this general principle, it is generally accepted that employers have an occupational health and safety responsibility to address drug-related hazards in the workforce.^{891–895} In occupational health and safety terms, an intoxicated person can be considered a hazard⁸⁹² and employers have a clear legal obligation to protect staff from hazards related to drug and alcohol use, including of tobacco, by other employees.⁸⁹³

10.7.2 The importance of workplace prevention

Historically, alcohol and other drug problems in the workplace have been dealt with through employee assistance programs (EAPs) and employer policies on employees with problematic drug use.⁸⁹⁶ In the case of alcohol, this has resulted in the growth and acceptance of EAPs as a worthwhile response to individual employees with drinking problems. Employees are more willing to seek help because reporting drinking problems does not threaten their job, and employers are more willing to retain such employees because use of the EAP indicates a willingness to change behaviour.

Although the majority of United States⁸⁹⁷ and Australian⁸⁹⁸ employers offer and support EAPs, there have been no definitive evaluations determining the effectiveness of EAP for treating alcohol and other drug problems.^{897, 898}

Nevertheless, a well-functioning EAP provides the opportunity for brief intervention,⁸⁹⁸ a treatment that has already been demonstrated to be highly effective for early-stage and/or less serious alcohol- and drug-related problems.

Ames considers that in addition to treating individuals with problematic alcohol and other drug use it is just as important to develop preventive interventions, arguing that primary prevention programs in the workplace should address the physical and cultural factors of the work environment that promote or facilitate problematic alcohol and other drug use.⁸⁹⁹ Primary prevention seeks to protect employees who are at risk of developing alcohol and other drug problems, and to avoid problems in the workplace that can be caused by employee alcohol and other drug use. Holder argues that workplace prevention needs to focus on problems caused by use rather than on individual users.⁸⁹⁶ In this way, interventions can deal comprehensively with all underlying factors. Prevention interventions can address features of the physical working environment that may encourage problematic alcohol and other drug use, such as hazardous working conditions⁹⁰⁰ or aspects of the culture and organisation of the workplace like poor promotion opportunities.⁹⁰¹ In some cases, the wider community may be an appropriate focus for prevention of alcohol and other drug problems because community norms, practices and regulations can determine consumption patterns that then adversely affect the workplace.⁹⁰²

Many employers equate prevention of alcohol and other drug problems in the workplace with drug testing and this strategy is increasingly being adopted in Australia, particularly in the mining industry. Because this strategy is both controversial and widespread, it is considered in some detail before discussion of other workplace prevention approaches.

10.7.3 Drug testing

Definition: The most common workforce prevention measure has been drug testing. This takes two main forms: urine testing for illicit drugs; and breath analysis for acute alcohol intoxication.^{404, 405} Whilst urine testing has a long history in the US, such procedures are less common in Australian workplaces.⁹⁰³

Random urinalysis for illicit drug use in the workplace—overview and concerns

The testing of urine to detect illicit drugs has a wide variety of applications, including law enforcement, clinical practice and research purposes. Makkai notes that testing technology, while not automatic and not always definitive, is nevertheless generally robust and lends itself to authoritative conclusions.⁹⁰⁴ It has also been observed that drug testing can improve the evidence base for policing and criminal justice by providing more scientific and rigorous methods for monitoring and evaluating criminal justice practice.⁹⁰⁵

Forms of drug testing in the workplace include random testing, pre-employment testing, and for-cause testing when an employer has a presumption that an employee may be drug impaired. Neither of the latter two forms have generated the controversy that has been directed at random drug testing.¹⁷⁶ There are two main justifications for workplace urine testing regimes: to improve productivity, and to improve safety.^{404, 405} Nolan points out that there has been increasing pressure on employers to demonstrate that they conform with Occupational Health and Safety Regulations if they are not to leave themselves exposed to the possibility of litigation in the event of work-related injuries or illness. Drug testing has been seen as a way of meeting those legal obligations.⁸⁹³

Some major concerns about random drug testing have been identified.

- Urine tests detect past illicit drug use, evident over varying time frames; they do not detect current drug use that may impact upon work performance.^{404, 405}
- Urine testing can be highly invasive and many people find the testing procedure objectionable.^{404, 405, 892, 894}
- Less invasive options (such as private provision of urine samples), whilst commonly used, allow for 'cheating' and are still considered to be undignified and objectionable procedures by many.⁸⁹¹
- There are significant privacy issues that relate to the extent to which an employer can legally inquire into the activities that employees engage in their own time.⁸⁹³
- Testing regimes have been criticised frequently as a quick-fix approach that ignores underlying causes of occupational health and safety issues, particularly fatigue which is arguably more damaging and is subject to far less control.⁸⁹³

Effectiveness of urine testing programs

Summary: Warrants further research 

Urine testing is not an accurate measure of impaired work performance, which can reduce safety, because it measures recent use not present intoxication.^{404, 405} In the case of cannabis, use can be as long ago as 30 days. There is no evidence that recent illicit drug use is associated with reduced productivity or safety impairments.^{404, 405}

Effectiveness evaluations of workplace urine testing programs and their impact have been scarce and generally poor in scientific terms.^{404, 405} In 1994, the American National Academies Committee on Drug Use in the Workplace found that the preventive effects of drug testing had not been adequately demonstrated, because of the weakness of the science.¹⁷⁶ Other reviews have determined that there is no scientific evidence of improvements to either workforce productivity or workplace safety from the implementation of urine testing programs, although there are numerous anecdotal reports or weak, poorly or uncontrolled evaluations reporting benefits.^{404, 405}

Breath testing for alcohol intoxication

Summary: Warrants further research 

Alcohol is both the most widely used drug in the workforce and the drug with the most deleterious impact on workplace performance and safety.^{404, 405} Alcohol breath testing is different from urine testing because it measures current intoxication rather than past use. It is well established that blood alcohol concentrations of greater than 0.05 (or possibly below this in some circumstances) produce a dose-dependent deterioration in performance. Impairment occurs mostly in attention, concentration, perceptual processes, and motor coordination and feedback.⁹⁰⁶ However, due to the poor quality of published studies, systematic reviews have been unable to confirm whether alcohol testing programs lead to improvements in productivity or safety.

Pre-employment drug testing

Summary: Limited investigation 

Pre-employment drug testing has been shown to have a small predictive effect on workplace performance but other predictors, such as level of education, are a more accurate predictor of performance.⁴⁰⁴ Again, there are no well-conducted studies identified in systematic reviews that can determine whether or not improved productivity or safety results from such screening programs.^{404, 405}

There is some evidence that the presence of drug testing policies have a deterrent effect in that a proportion of current and past drug users, and some with strongly held personal ethical objections to drug testing, will not apply for jobs.^{404, 405, 907} But again, there is no evidence that this improves workplace safety or productivity.^{404, 405}

Testing for safety-sensitive positions

Summary: Evidence for implementation ★

It is generally accepted that for positions with special safety concerns (e.g. airline pilots), alcohol and other drug testing programs have a useful role, despite the absence of any well-controlled studies to determine effectiveness.^{404, 903, 908} The high cost associated with errors outweighs ethical concerns about the high number of false positive results and the invasiveness of the test.

Other forms of testing, such as hair testing and performance testing, are available but there is, as yet, no evidence of any benefits or improvements to productivity or safety criteria as a result of their implementation.^{404, 903, 909}

10.7.4 Information, education, and brief intervention programs

Summary: Warrants further research P

There is a long history of using education programs to reduce or stop alcohol and other drug consumption, particularly in school settings.

However, the research evidence indicates that just providing factual information about the harmful consequences of alcohol and other drug use is ineffective.^{896, 910} This does not mean that alcohol and other drug education should not be provided. Holder suggests that educational campaigns can increase support for other prevention programs. In this sense, they can serve to orient employees to why use of alcohol and other drugs can be a problem in the workplace and prepare the ground for more targeted prevention programs.⁸⁹⁶

Accordingly, contemporary workplace programs have an education component but emphasise the development of specific prevention skills. Brief interventions have been recommended for application in many workplace settings given their wide evidence base for efficacy.⁹⁰⁸

10.7.5 Broad-spectrum health promotion programs

Health Promotion Programs (HPPs) provide information on health-related matters and teach participants how to improve or maintain their health. They are not usually aimed exclusively at alcohol and other drug use but they might be considered alternatives to drug testing in that, if successful, they would reduce the need for testing.⁹¹¹ HPPs are a relatively recent feature in the workplace and there is not yet a substantial body of research that indicates whether such programs can prevent alcohol and other drug problems.⁴⁰⁵

10.7.6 Whole-of-community approaches

It has been argued that that one of the major limitations of single application workplace prevention approaches is they do not acknowledge the role of the broader community in shaping alcohol and other drug consumption norms.⁸⁹⁶ Undertaking prevention activities solely at the worksite may be of limited value in some settings and a more productive approach may be to include community-level prevention, in the expectation that less harmful patterns of consumption, generally, will also benefit the workplace.

10.7.7 Summary of workplace prevention

There is no strong empirical evidence that any particular workplace alcohol and other drug prevention strategy delivers benefit in terms of reduced consumption or lower levels of harm. There are, however, strong theoretical reasons why interventions proven in other arenas, such as brief interventions, breath-testing and developing policies to reduce availability of alcohol, will be effective. The design of alcohol and other drug policies in the workforce is clearly an area where extensive further research is required in order to inform effective, evidence-based policy responses.^{404, 405} For example, there are strong theoretical advantages for the use of accurate drug tests that detect current impairment, such as breath-testing for alcohol. Strong theoretical grounds exist for developing more accurate tests of current impairment from other drugs that might impair performance. Until these are developed, it is arguable that testing in worksites with no special physical hazards is unethical. Where there are obvious physical hazards, ethical concerns may be outweighed by the theoretical benefits of drug testing.

10.8 Social marketing—State/national media campaigns, and booklet campaigns

10.8.1 Mass media marketing and advocacy as prevention

The mass media has a substantial presence in all market-based societies and has been a powerful vehicle for the promotion of the two licit recreational drugs: alcohol and tobacco. In the main, this has involved product advertising but the media has also been used for political lobbying. Large advertising and public relations budgets, coupled with considerable expertise, have allowed the alcohol and tobacco industries to develop sophisticated mass media marketing and advocacy activities. However, public health agents have increasingly entered the fray by advocating and marketing competing messages about alcohol and tobacco use. In Australia, the QUIT campaign is a good example. This well-known national anti-smoking campaign has a long history of effectively using television advertising to deliver its message.⁹¹² In recent years, media prevention campaigns have begun to match the sophistication achieved by the alcohol and tobacco industry. In the process, Boots and Midford considered that much has been learned about how to give health messages an effective presence in the mass media market-place.⁹¹³

Mass media marketing and mass media advocacy are similar activities, in that they both use the mass media as a vehicle to achieve the same primary goal: that of creating change within the community. However, while change is central to both activities, the type of change targeted and methods employed are quite different. Mass media marketing strategies inherently support and seek to replicate the product marketing strategies that are associated with the free market economy and its focus on choice, consumerism, and individuals. A central concept in commercial marketing is the exchange of a product or service for money.⁹¹⁴ However, this mutually beneficial exchange is less obvious in social marketing and can lead to a sense that consumers are being coerced rather than being offered a way of satisfying their own needs. Accordingly, the benefits of change need to be emphasised rather than the negative consequences of the target behaviour. Hastings and Haywood illustrate this with an example from research conducted into young people's attitudes towards drinking in moderation.⁹¹⁴ The research found that girls considered boys who were controlling their alcohol intake in a social setting to be more attractive than

boys who were not doing this. This has considerable implications for marketing a message that is mutually beneficial for the marketer and the consumer.

Advertising is the major method used in mass media prevention marketing and it may be paid, or unpaid as in community service announcements. It has been used to: orient the public to an issue, such as drink-driving; teach relevant skills such as measuring standard drinks in different beverages; and warn of consequences, such as smoking causing lung cancer. A second strategy involves creating publicity, such as getting a well-known identity to launch a prevention campaign. This can be useful to supplement advertising or advocacy campaigns but is seldom used in isolation.⁹¹³ A more recent marketing strategy is 'edutainment', which involves the deliberate placement of educational messages in entertainment contexts. Here the purpose is to have characters with whom the target audience identifies, to model certain behaviour that social marketers want replicated.⁹¹⁵

10.8.2 Mass media advertising—what works

Mass media campaigns—tobacco

Summary: Evidence for outcome effectiveness ★★

Mass media marketing of drug-related health issues is not a recent phenomenon. Groups such as temperance unions have been creating news and even sponsoring mass media advertising since the late 19th century. However, despite their long history, evidence of the effectiveness of early mass media marketing campaigns is difficult to find. According to Backer and colleagues, pre-1971 mass media health campaign evaluations mostly showed that the campaigns had failed.⁹¹⁶ Montagne and Scott indicate that such old style mass media campaigns in isolation mostly influenced knowledge and had little impact on behaviour.⁹¹⁷ They also tended to target broad audiences, which reduced their ability to focus on specific issues. Montagne and Scott consider that old style campaigns were limited to reinforcing existing social attitudes and norms, such as not drinking and driving. However, anti-smoking media campaigns seem to be an exception. In a number of American States, campaigns that featured anti-smoking advertising were followed by reductions in smoking, although it was not possible to identify the particular effect of the advertising component.⁹¹² In Australia, the QUIT campaign used TV advertising as its main element and a number of evaluations showed that smoking

decreased in cities where the campaign was run.⁹¹⁸ ⁹¹⁹ These findings were replicated in a British anti-smoking television advertising campaign wherein the evaluation indicated that smoking was reduced by about 1.2%. The well-known harms associated with smoking, and the simplicity of the 'do not smoke' message, may be factors in the effectiveness of these media-based campaigns.

Most recently, the Commonwealth has developed the National Tobacco Campaign, (NTC) a major initiative launched in 1997 with follow-ups in subsequent years, aimed primarily at assisting smokers, aged 18 to 40 years, to quit.⁹²⁰ This has been the most intense and longest running anti-tobacco campaign in Australia. A major element of the campaign is the partnerships achieved between the Commonwealth and all State and Territory jurisdictions, as well as non-government organisations.⁹²⁰

The evaluation has also been intense and the NTC has been called the 'most comprehensively evaluated national health promotion campaign mounted in Australia to date' (p4).⁹²¹ To the end of 1998, the evaluation consisted of a Benchmark and two follow-up surveys, as well as a survey of CALD populations and continuous tracking. Several additional studies were undertaken: a comparison of teenage and adult surveys, a price discounting analysis, a print media monitoring study, and an economic evaluation of the NTC.⁹²¹ These studies have been published in a two-volume evaluation monograph.^{920, 921}

The campaign used the stages-of-change model as a theoretical base and aimed to move smokers through stages to increase the likelihood that they would consider quitting. The evaluation found that the first phase was successful and there was also evidence of a reduction in overall prevalence of smoking. Young people, although they were not targeted by the NTC, were also influenced, although there are no specific data pointing to reductions in teenage smoking. The economic evaluation suggested that the NTC was excellent value for money and could have been associated with savings of up to \$24m set against the approximately \$9m spent by Commonwealth and State/Territory Governments.⁹²¹

The evaluators concluded that the initiative of investing strongly and intensively in a National Tobacco Campaign was the right one, but warned that the focus on campaign strategies, target groups and advertising themes needed to be kept under review and refreshed on an ongoing basis.⁹²¹

Mass media campaigns—alcohol

Summary: Evidence for implementation ★

In recent years, mass media marketing of alcohol prevention has been used as part of larger, successful community-based programs.^{726, 922} The strength of this approach may be to reinforce community awareness of the problems created by alcohol use and prepare the ground for specific interventions.⁹²² Backer, Rogers, and Sopory claim, however, that these recent alcohol campaigns have been successful in their own right because they have been based on rigorous social science theories, formative evaluation research has been undertaken, and because the campaign objectives have been realistic.⁹¹⁶

An evaluation of the Danish National Campaigns on Alcohol, presented in the mass media since 1990, provides an example of what can be achieved by a well-conceptualised mass media campaign. The campaigns had three goals related to 'sensible' alcohol consumption and an overall goal of reduction in total consumption. These goals were operationalised into four objectives that included the two mass media marketing objectives of increasing knowledge of, and the number of people who followed, the national recommended guidelines for consumption.⁹²³

Strunge reported that the campaigns reached their knowledge objectives. A small percentage of survey respondents also indicated that the campaigns had directly influenced their behaviour. Twelve percent of people surveyed, in 1997, stated that they had reduced their alcohol consumption, with the majority reporting that health concerns were the motivation for this reduction. Strunge concluded that 'it is possible to generate positive awareness of alcohol information', and that 'a continuous effort is necessary to maintain and increase the effects of the campaigns' (p79).⁹²³

The National Alcohol Education and Risk Awareness Campaign is an Australian example of a national alcohol campaign.⁹²⁴ This campaign was based on formative research that found that risky levels of drinking were highest in the age range 18 to 35 years. However, the research also suggested that these drinkers did not identify with messages about alcohol-related harm. The campaign was intended to engage drinkers in a personally relevant way and to increase the likelihood that they would drink in ways that were not harmful to themselves or others. The initial phase commenced in January 1995, with television, cinema, print and interior bus panel advertisements for up to five months. There was

also a national phone line and involvement of State/Territory Government services.

The evaluation included a benchmark survey and an initial tracking survey. Reports on these studies show that awareness of the campaign was high and that messages were recalled. One in three said the advertisements had 'made them think' about their own drinking but there was, as yet, no evidence of major behaviour change. It was evident that effective communication with these drinkers had been very difficult, but the evaluators maintained that the campaign had played an agenda-setting role against which standard drink labelling would be set later that year.⁹²⁴ (See 181).

Another example of the prevention benefits of a mass media alcohol campaign is provided by the sophisticated evaluation of a drink-drive advertising campaign in Victoria.⁹²⁵ The alcohol advertising was part of a broader road safety advertising campaign undertaken by the Victorian Transport Accident Commission (TAC). Approximately 70% of the advertising was placed on television, with the remainder on radio, in the print media, on outdoor advertising and in cinemas. Although the alcohol-related component was only one of four elements of the advertising campaign, the evaluation was able to identify the relationship between the drink-drive-related advertising and alcohol-related traffic crashes. Analysis of crashes at times when alcohol involvement was known to be high identified that there was a significant relationship between reduction of crashes and TAC drink-drive publicity.⁹²⁵

Mass media campaigns— illicit drugs

Summary: Warrants further research 

Australian media campaigns have also been targeted at illicit drugs. An early anti-heroin campaign⁹²⁶ was independently evaluated using community and illicit drug user surveys. These surveys found that the advertisements had been seen and the messages recalled, and there was some suggestion in the follow-up illicit drug user survey that the campaign had been associated with changes in the proportion of people at higher risk of using heroin. The follow-up rate among illicit drug users was low (57%), however, and users of 'hard' drugs were the most likely not to have been re-interviewed.⁹²⁶

A current campaign targeting illicit drugs is aimed both at users and their parents. The National Illicit Drugs Campaign (NIDC) is a two-part community education and information campaign which commenced in March 2001. It is aimed at preventing young people from experimenting with

illicit drugs. Stage one targeted parents and encouraged them to talk to their children about illicit drugs. Stage two targets youth. The role of Stage one was to provide information and support to parents of eight to 17 year olds about the role they could play in preventing drug use amongst their children and teenagers.⁹²⁷

The campaign is based on extensive formative research involving focus groups and in-depth interviews with parents and other members of the general community; including members of Non-English Speaking Background (NESB) communities and approximately 1000 telephone interviews with parents of 12 to 17 year olds. These investigations encompassed parents knowledge of, and fears about their children's illicit drug use. The research showed that parents would welcome help with improving their skills, knowledge and confidence in talking to their teenagers about drugs.

The final campaign elements include television commercials, print and radio advertisements, a parent booklet delivered to every household and made available in 16 languages in addition to English, a telephone information line, and a campaign web site that includes information for parents and public relations activities. Radio and print media materials were developed for NESB parents and consultations about the materials were held with the National Drug Strategy Reference Group for Aboriginal and Torres Strait Islander Peoples.

The evaluation components for Stage one consisted of quantitative pre-campaign benchmark and post-campaign evaluation surveys with parents of eight to 17 years olds, non-parents aged 18 to 69 years, and youth aged 15 to 17 years. Other elements were a quantitative post-campaign survey with NESB parents and weekly tracking surveys.⁹²⁸

The results of the parent surveys indicated the following: that campaign recall and recognition were high and key messages retained; around half of the parents surveyed had read at least part of the Booklet and most of those (41% of all parents and 29% of NESB parents) found it useful; and around half of all parents and 40% of NESB parents said they had taken some action—the majority by talking to their children about drugs. Most said they found this easier than before the campaign. Most (57%) of parents and 38% of NESB parents had spoken to someone (most often their children) about illicit drugs in the past two months.⁹²⁸

It was concluded that the parents' component of the NIDC had been successful in achieving its

objectives, although there had been no increase in parents' feelings of confidence between the two surveys. Most of the parents, both general and NESB, who were aware of the booklet had read at least some of it and/or found it useful. However, fewer NESB parents (47%) compared to other parents (68%) had seen the booklet. The specific needs of NESB parents were not discussed other than to say that they were at 'an earlier stage of awareness' in relation to illicit drugs. Until the campaign has been concluded, it is difficult to estimate how successful it will be, overall.

Mass media 'edutainment' to reduce alcohol-related harm

The Harvard Alcohol Pro sought to introduce the concept of a 'designated driver' as a new social norm in the United States, and a key strategy was the use of entertainment television to promote the designated driver concept. The project staff spoke with more than 250 producers and writers associated with all the leading prime-time television entertainment shows and convinced them to support the project objectives. Their efforts resulted in more than 160 prime-time television programs, including the notion of the designated driver in a television episode. Evaluation of the impact of the concept has been undertaken using Gallup polls that ask respondents about their use of designated drivers. DeJong reported that 64% of adults reported that 'they and their friends assign a designated driver when they go out for social events where alcoholic beverages are consumed' (p26).⁹²⁹

10.8.3 Mass media advocacy

Here advocacy refers to the promotion of healthy public policy by influencing decision makers to accept the merit of processes, policies or structures that bestow a health advantage. A major tool used in this process is political lobbying, which is the presenting of arguments in favour of a particular policy course to those making the policy decision. Another is coalition building, which involves the development of a common policy objective for groups and individuals in a community. A third is the use of mass media, typically the news media, to highlight and advance a particular public health issue. This last approach has been promoted by Wallack⁹³⁰ and is commonly referred to as media advocacy.

The major challenge of all forms of advocacy is to move the debate from individually focused, simple definitions of problems to a level of complex sociopolitical conceptualisation, where the targeted health problem is seen as a product of the

interaction between the individual and the environment.

According to Wallack *et al*

Advocacy is necessary to steer public attention away from disease as a personal problem to health as a social issue...(and)...advocacy is a strategy for blending science and politics with a social justice value orientation to make the system work better, particularly for those with the least resources (p5).⁹³¹

The most successful public health policy reformers have based their advocacy on sound research data and have utilised all three approaches to achieve their objectives. The approach has been applied successfully in the areas of smoking control⁹³² and alcohol.⁹³⁰

Advocacy is a political activity because it encourages social change via a political route. Advocacy can target the laws of Australian, State or local government, policies of governments and private institutions, or the actions of groups or industries that seek to oppose public health goals. Such change is likely to challenge the status quo, and therefore, the concept and practice of advocacy often threatens those in positions of power and with vested interests. The hostility generated by this challenge to the status quo is often a major barrier to advocacy goals.⁹¹³

There is increasing recognition that successful media advocacy is dependant upon the implementation of coalition building and political advocacy.

As Wallack notes

The reality is that mass media, whether public information campaigns, social marketing approaches, or media advocacy initiatives, are simply not sufficient to stimulate significant and lasting change on public health issues. The power for change comes from a broader advocacy that has widespread community support. Coalition building, leadership development, and extensive public participation form the foundation from which successful advocacy and media initiatives can make a difference (p27).⁹³¹

Media advocacy to reduce drug-related harm may take a number of different forms. For example, media advocacy can be used to set a public agenda by heightening the profile of a drug-related problem through the presentation of research findings; it can be used to espouse the benefits or success of a program or intervention in order to support its refunding; it can be used to publicly oppose or question the actions of members of the alcohol or tobacco industry when those actions are

likely to increase harm; it can support the call for increased resource allocation to address drug-related problems; or it can highlight the inadequacies of government action to address drug problems.

In practice, media advocacy can involve many different actions ranging from covert action, such as releasing confidential information to the media, to overt actions such as issuing a media release related to concerns about an alcohol product (e.g. alcoholic ice-blocks). Chapman and Lupton provide a list of 66 advocacy issues, tips and discussion points illustrated with numerous examples that provide public health workers with a comprehensive picture of media advocacy in practice.⁹³³

Examples include

- **Advertising in advocacy:** careful use of advertising can support or even initiate news or current affairs coverage as well as being an advocacy tool in its own right. For example, a large paid advertisement in the Australian newspaper called on State Health Ministers to introduce standard drinks labelling on alcohol containers. This advertisement was used to generate media releases in each State with local organisations available for interview; consequently, significant media coverage was gained.
- **Anniversaries:** health promoters can often create a 'new' newsworthy story out of a story that occurred in the past by advertising an anniversary of an event or instituting a day of remembrance. Such events will probably be significant public events such as gun massacres, notorious chemical spills, nuclear accidents, or the death of a famous person from a particular disease or condition.
- **Creative epidemiology:** this is a term used to describe the process of translating complex epidemiological data into media friendly terms. For example, if 18 000 people per year die in Australia as a result of smoking, (on average) 10 people die every day in Perth as a result of smoking. Large numbers can lose their impact and, therefore, it is often useful to localise and humanise statistics.
- **Letters to the editor:** like advertising, the writing of a letter to the editor of a newspaper is another form of undertaking media advocacy. It may also result in further public debate and media interest. Such letters, however, must fit within the guidelines laid by the newspaper and are more likely to be published if well written and topical.

- **Opinion polls:** opinion polls can be a very effective part of media advocacy because they can form the basis of a media release. The use of polls to support a view is, of course, a standard ploy used by people for many years. Such polls are often treated sceptically by the public but, nevertheless, they can be invaluable if used carefully. Even 'quick and dirty' polls of small sample sizes which ask questions that produce the 'right' answers can prove effective when released before a decision making process is to begin, and when released by a respected organisation. Polls by opponents of the view, or those of related issues, can also be valuable as an opportunity to present a case. A prompt response will be required to 'piggyback' on someone else's research.

Case studies of mass media advocacy

An example of the role that media advocacy can play to reduce alcohol-related harm is described by Hawks⁹³⁴ and Stockwell and Single.⁹³⁵ They recorded the process, outputs and outcome of attempts to introduce compulsory 'standard drinks' labelling on all Australian alcohol containers. Ultimately successful, and the first such legislation in the world, this minor policy achievement was nevertheless complex and required considerable expertise, time, and effort, as well as a mix of advocacy strategies to effect the desired change. Advocacy of policies that more directly threaten commercial interests (e.g. tax reform) has been less successful in Australia despite similar levels of effort.¹⁸⁸

In Australia, the process of introducing the 'standard drink' began in 1984 with the earliest publications referring to the need to identify a standard unit of measurement that would allow consumers to accurately comprehend the alcohol content of liquor within alcohol containers. Early public discussions were followed by an initial proposal for government action and a lengthy period of research into both the need for public education and into the public support of the concept. The development and debate of further submissions and a period of advocacy for change eventually resulted in the government decision to act and the legislation passed through parliament. The latter final event occurred in December 1995, almost twelve years after the first action was initiated.

During this twelve year period, the year of 1994 included extensive media advocacy from public health advocates who, by 1994, had established a formidable coalition that included a research organisation, the National Centre for Research into

the Prevention of Drug Abuse; an advocacy agency, the Alcohol Advisory Council of Western Australia; and an industry group, the Winemakers Federation. Similarly, considerable political lobbying had occurred behind the scenes using the research data collected to support the submissions developed. Likewise, two large industry groups representing brewers and distillers undertook considerable lobbying activity, including the production of a document entitled *Standard drinks: Myths, facts and some surprises*, and the delegation of representatives to meet with all relevant government ministers throughout Australia. To counter industry lobbying and to support the other advocacy strategies, a concerted media advocacy strategy was implemented in 1994 in the lead up to, and following, a meeting of the Ministerial Council on Drug Strategy (who were responsible for recommending such action to the Government). A half page advertisement supporting legislation of 'standard drinks' was placed in Australia's major national newspaper by 19 individuals and organisations, and a series of press releases were issued during September and October, 1994, that resulted in widespread media coverage. Public confirmation of government support for standard drink labelling occurred on 30 September, 1994 and the legislation passed in December 1995.

The experience provides important lessons about media advocacy. The first of these is that advocacy for major change usually requires considerable time and commitment. This is so even when health advocates hold 'the high moral ground' (as in this example where the opposition was identified by the public as tainted by the motive of financial profit). Furthermore, media advocacy and other advocacy strategies are essential to achieve change when change is likely to have powerful and financial opponents. Such opponents will almost certainly undertake advocacy of their own. Additionally, media advocacy requires extreme care during both its planning and implementation so as present a clear message that is supported by all members of the advocacy coalition. Finally, key individuals can be critical to the success or failure of advocacy strategies, especially when they are at the centre of the flow of information and advocacy activity, or have decision making power.

10.8.4 Combining mass media marketing and advocacy

The media activity undertaken as part of the Community Prevention Trials Project demonstrates how mass media marketing and advocacy can be used to create prevention synergies. Holder and Treno described how media publicity was used as part of this prevention project to highlight and support the specific prevention components that targeted drinking and driving, underage drinking, responsible beverage service and alcohol availability.⁹²² As part of the drinking and driving component, local police departments were provided with additional breath testing equipment and new passive sensor devices, which provided an additional aid in the detection of over-the-limit drivers not presenting observable symptoms of heavy drinking. Use of this equipment represented a new approach to the detection of drink driving and was actively promoted to the media within the affected communities because of its novelty and because what was being done in each community had national practice ramifications. There is a marketing aspect to this example because the media coverage was designed to increase the perceived risk of drink driving detection; but Holder and Treno considered that the news coverage also encouraged increased enforcement efforts by police because it indicated community support. In this respect, the initiative should be considered media advocacy because it sought to change institutional practice. These effects were confirmed in the project evaluation and Holder and Treno drew three conclusions from this media strategy.

1. Mass communication in itself is not enough to reduce alcohol-related trauma but can be used effectively to reinforce specific environmental efforts to reduce high-risk alcohol-related activities, such as drink-driving.
2. Local communication is best presented through local news media and can focus public attention on alcohol-related problems without having to use professionally produced material.
3. Media advocacy can be taken up by community members if appropriate training is provided, which means that the capacity to use this prevention measure is capable of being institutionalised within the community.⁹²²

10.8.5 Summary for mass media campaigns

Holder considers that mass media marketing and advocacy are not likely to be sufficient to produce a reduction in alcohol-involved trauma, even when used together,⁹³⁶ although these strategies seem to work better in reducing the prevalence of smoking.^{912, 932} It seems that the two media components are most effective when they form part of a broader strategy that includes a range of other activities, such as community development and community mobilisation, school and community education, health promotion, policy development and institutionalisation, coalition building and political lobbying. Thus, mass media marketing and mass media advocacy are valuable activities, as has been well documented by alcohol harm reduction research projects, in the United States (e.g. Community Prevention Trial to Reduce Alcohol-Involved Trauma),⁷²⁷ Australia (e.g. Community Mobilisation to Prevent Alcohol Related Injury)⁸⁵⁰ and New Zealand (e.g. Community Action Project).⁸⁴⁰ It is within the framework of such comprehensive public health action that 'best practice' forms of mass media marketing and advocacy have been, and will continue to be, successfully employed to reduce alcohol-related harm.

10.8.6 National drinking guidelines and standard drink labelling

Summary: Evidence for implementation ★

Australia is one of a handful of countries whose health authorities promote and regularly update national guidelines for low-risk alcohol consumption. The National Health and Medical Research Council provided revised guidelines, in late 2001.⁴² Earlier editions of these guidelines, in 1987,⁹³⁷ and its revision published in 1992,⁹³⁸ have been among the most significant and influential source documents in the field. They are frequently cited and have informed national media campaigns (e.g. Alcohol Go Easy) and a wide variety of brief intervention, road safety and health promotion materials commonly used by Australian health professionals. It is important to note that some of these related interventions are themselves evidence-based, as discussed elsewhere in this volume—in particular brief interventions and some road safety campaigns. The levels of drinking once defined as 'hazardous' and 'harmful' (now 'risky' and 'high-risk') were the basis of the two other documents of national significance in the 1990s: the English *et al.*⁴⁰⁸ quantification of drug-related morbidity and

mortality; and the Collins and Lapsley⁹³⁹ estimates of the economic costs of drug misuse. English *et al.*⁴⁰⁸ used the NHMRC guideline definitions of drinking risk as the basis for many of their calculations on alcohol-related harm, while Collins and Lapsley,⁹³⁹ in turn, relied heavily on the English *et al.* estimates for their costing exercise. In short, the previous guidelines have been central to policy, practice and research in Australia in recent years.

Given the central role such guidelines have played and the reliance made on them by other evidence-based strategies, it is hard to provide any evaluation of their effectiveness in isolation from other related strategies and policies. A number of surveys have evaluated the extent to which the messages they contain are known to, and understood by, the public. Two key components of the messages are: the concept of a standard drink, and the number of standard drinks that can be consumed per day by men and women with minimal risk to health. As noted above, in 1995 the Commonwealth Government approved a submission for the placement of standard drink labels on all alcohol containers sold in Australia, in order to facilitate drinkers being able to estimate whether or not they had exceeded recommended daily limits.⁹³⁵ This decision was based on evidence from Australian research that such labels enabled beer and wine drinkers to make more accurate estimates of the alcohol content of commonly available beverages, and also to pour a standard drink from different containers.⁹³⁵ A survey conducted prior to the labelling decision also found that while most drinkers were aware of the concept of a standard drink, few could define it accurately or apply it accurately to estimate the number of standard drinks in commonly available beverages.⁹⁴⁰ Tracking research conducted by the Commonwealth Department of Health suggested that general awareness of the concept of a standard drink had risen during the 1990s, but no formal evaluation of the labelling strategy has been conducted. It should be noted that the developmental research on standard drinks in the early 1990s used 9mm high lettering whereas the current requirements are for lettering of only a minimum of 1.5mm high; this may well limit public awareness of these labels.⁹⁴¹ The 2001 NDSHS found quite strong public support for providing larger labels on all alcohol containers, with 68% supporting this proposal.⁹⁴² A general point in favour of labelling alcohol containers as a means of getting information out to drinkers is that, uniquely, the people who receive and can recall the information are those who drink the most. Therefore, this is a very efficient means of

providing information to risky and high-risk drinkers.⁹⁴³ This fact has led to the proposal for consideration of using alcohol container labels as a means of conveying simple messages consistent with the new guidelines.⁴⁷⁵ The 2001 NDSHS found that 71% of the large sample of Australians surveyed were in favour of providing information about the Australian Alcohol Guidelines directly on alcohol containers.⁹⁴²

In summary, we suggest that Australia's national drinking guidelines are a valuable basis for much of what is done in the name of prevention, treatment and policy on alcohol. Their wide dissemination will assist numerous other evidence-based strategies such as brief interventions in primary health care, alcohol education in schools and controlled drinking programs for early stage problem drinkers. The concept of the standard drink, and its accurate application, is also an essential part of applying the guidelines across all drinking settings. As such, wide dissemination of the NHMRC guidelines and their component messages and concepts, by whatever means, is an important aspect of a national prevention agenda relating to alcohol. This is not to underestimate the difficulties of changing social norms supporting high-risk drinking patterns; it is to recommend that national drinking guidelines are an important ingredient in an overall national alcohol strategy and are recommended here for continued implementation.

CHAPTER 11: REGULATION AND LAW ENFORCEMENT OF LICIT DRUGS

11.1 Summary

This chapter reviews the regulation and law enforcement of licit drugs. There is strong support for regulatory strategies for reducing the use of legal drugs and their related harms. A wide range of laws and regulations control or restrict the availability of licit drugs, particularly alcohol and tobacco. These include licensing restrictions, advertising controls, the regulation of sale and supply of alcohol and tobacco to minors, and taxation initiatives. There are also regulations that govern the availability of pharmaceuticals, including restrictions on the provision of the over-the-counter (OTC) drugs and restrictions on prescription drugs that can be used recreationally. Other control strategies include initiatives to limit the free availability of inhalants, particularly to minors.

Strategies that maintain or increase the price of legal drugs through taxation have the strongest support within the international research literature. The States and Territories of Australia have, in the past, implemented hypothecated taxes on alcohol and tobacco, which direct revenue to earmarked treatment and prevention programs. These are now only feasible at the Australian Government level. Unlike other taxation strategies, such hypothecated taxes tend to be well supported by the public. The related strategy of restricting price discounting is also well supported. However, marked price rises can lead to increased black market activity that can offset some of the health and safety benefits.

Other well-supported regulatory strategies include restrictions on advertising and marketing of tobacco products, restrictions on late-night trading hours of licensed premises, responsible alcohol service supported by liquor law enforcement, voluntary local licensee agreements or Accords (also when supported by law enforcement), restrictions on sales of tobacco and alcohol to minors, and restrictions of alcohol availability in mainly Indigenous communities. There is some evidence to support defining the legal responsibilities of licensees towards intoxicated customers through the development of model legislation, or Dram Shop Laws as they are known in North America. There is a need for further research to test the effectiveness of controls on liquor outlets density, and restrictions on alcohol advertising.

Moves to limit the diversion of prescribed pharmaceuticals onto the black market have achieved some success, but restrictions on the availability of performance and image-enhancing drugs have been less successful. Control of the supply of volatile substances to young people is very difficult and cannot be said to have been successful.

While tobacco regulatory strategies have been implemented more widely and effectively than is the case for alcohol, in Australia, progress with reducing tobacco-related harm has slowed and new initiatives may be required if there is to be further progress. New strategies are required, in particular, to respond to the internationalisation of advertising through new media, both for alcohol and tobacco.

The distinction between 'licit' and 'illicit' drugs is somewhat blurred. Some drugs, such as alcohol and tobacco, can be legally sold to adults but not to minors; some prescription drugs can be obtained legally but are used for non-medical purposes, or obtained with stolen or bought prescriptions, by 'doctor shopping' or on the black market. Some communities have chosen to limit or proscribe the supply of alcohol, whilst the use of alcohol and illicit drugs is prohibited in prisons.

The chapter is divided by drug type and reviews evidence relating to tobacco, alcohol, and pharmaceuticals, including volatile substances, and performance and image enhancing drugs.

Intervention	Strength of evidence	Nature of evidence	Comment
Tobacco			
Restriction of advertising and sponsorship	★ ★	Cochrane reviews conclude that advertising controls and restrictions can reduce tobacco consumption in the general community	Broad restrictions required to prevent industry finding effective alternative media
Maintaining price disincentives	★ ★ ★	Established beyond reasonable doubt that increases in price cause decreases in consumption	Increasing prices through taxation is most effective method of achieving long-term reductions in smoking; can be undermined by the black market
Health warning and control pack design	O	Limited research; one Australian study suggesting slight impact on smoking rates	Difficult to research
Working with the industry	O	Little empirical data	One example concerning communicating levels of tar, nicotine and carbon monoxide permitted
Alcohol			
Restrict alcohol promotions to young people	Ⓜ	Reasonable rationale and evidence linking exposure to advertisements with later drinking.	Difficult area to research; WHO Declaration and forthcoming literature review may have different conclusion
Increase price through taxation to reduce consumption and harm	★ ★	Very strong evidence-based rationale; extent of effect of price on consumption varies but (almost) invariably reduces consumption and harm; systematic reviews to support; limited public support	Tax increases are not always fully passed on to the consumer; consumers may adapt by drinking cheaper products; need to be at a level that will not overly stimulate a black market
Hypothecated taxes on alcohol to fund treatment and prevention programs	★ ★ ★	Very strong rationale, including increase in price; well accepted by community; implemented in NZ and NT (past); controlled Australian evaluation with positive results	States and Territories can no longer implement; only Australian government
Outlet density	Ⓜ	Strong rationale but no model for implementation; likely support from established retail alcohol industry	Current practice is for licences to be easy to acquire
Outlet trading hours	★ ★	Strong rationale: recent Australian studies (NSW, WA and NT) linking of harms with late-night trading; a recent Scandinavian study showed increased harms with extended hours	Recent trend has been for later hours in Australia
Responsible alcohol service and enforcement of liquor laws	★ ★ with visible law enforcement re service to intoxicated Ⓜ without enforcement of liquor laws	Poor effectiveness in community-wide applications in absence of relevant law enforcement; international evidence that law enforcement alone very effective; evidence for mandatory server training	Need for an Australian demonstration project; some states have mandatory training for managers and licensees
Restrictions on price discounting	★ ★	Very strong rationale: general relationship between price, consumption and harm; specific evidence re 'happy hours'; implemented as part of Accords in Australia	Current restrictions only apply to some on-premise licences, not liquor stores

Intervention	Strength of evidence	Nature of evidence	Comment
Alcohol			
Licensee codes of conduct (e.g. Accords)	★★2/2 when accompanied by external pressures (e.g. enforcement) ☒0/1 without enforcement	Strong rationale, Australian implementation, three evaluations, evidence for reductions in violence though results depend on presence of external pressures for compliance	Concerns re long-term sustainability
Dram Shop Laws	★	Good rationale; evidence of deterrent effect in US and Canada; likely resistance to concept in Australia; rigorous review identifies civil liability suits for service to intoxicated customers a theoretical possibility	Model Dram Shop laws have not been drafted for Australia; limited civil case law re licensees permitting violent conduct
Licensing restrictions in Indigenous communities	★★	Evaluations from various locations in WA and the NT; most effective when part of a broad strategy and have community support	Must have Indigenous community support
Declaration of Indigenous communities as 'dry'	★★	Evaluations from the NT, SA, and WA; can be effective but communities need support to enforce them	Must be under community control
Pharmaceuticals			
Education to prevent 'doctor shopping'	☒	HIC internal evaluation— number of repeat prescriptions from different doctors reduced	Strong rationale
Re-scheduling temazepam	★	UK evaluation successful; no Australian evaluation yet	Strong rationale; need to evaluate whether new formulation has unintended negative consequences
Re-scheduling flunitrazepam	☒	IDRS data reports less available	Unclear if this will reduce drug-assisted sexual assault
Restricting volatile substances	☒	UK found that laws prosecuting and restricting suppliers had resulted in switch to more dangerous inhalants; no known Australian evaluation on variety of approaches	Legislation varies with jurisdiction — hard to comment on Australia as a whole
Controls on the supply of petrol in Indigenous communities	☒	Evidence for effectiveness limited and equivocal	Unlikely to be effective in isolation from broader interventions
PEDs seizures	0	Increased seizures in 2000/01, possible relationship to Olympics	

Key:

- 0 Limited investigation
- ☒ Evidence is contra-indicative
- ☒ Warrants further research
- ★ Evidence for implementation
- ★★ Evidence for outcome effectiveness
- ★★★ Evidence for effective dissemination

11.2 Tobacco

Definition: The impact of regulatory controls on the price, promotion and availability of cigarettes has a strong empirical base. Controls on smoking in public places to protect non-smokers from the effects of passive smoking are discussed as a harm reduction strategy in Chapter 14.

11.2.1 Restriction of tobacco advertising and sponsorship

Summary: Evidence for outcome effectiveness ★★

Advertising by tobacco companies has promoted images of smoking likely to appeal to many young people. This has led, in many countries, to restrictions or bans on tobacco advertising and sponsorship. Victoria introduced restrictions on tobacco advertising and promotion in 1987. Australia-wide, the Smoking and Tobacco Products Advertisements (Prohibition) Act came into effect in December 1990, banning advertising in magazines. It was followed by the Tobacco Advertising Prohibition Act 1992, which removed all tobacco advertising by 1995.

Although these measures have met with very strong support, there is relatively little good data on the effect of these initiatives on adolescent smoking. Norway and Finland introduced similar legislation in the mid seventies. In Finland, there was no fall in the prevalence of smoking following the ban on advertising, but some change did take place in brands smoked, as well as a shift to low tar cigarettes. In Norway, there was a reduction in the prevalence of adult smoking, and that for young people appeared to follow this trend.

Cochrane reviews have demonstrated that advertising controls and restrictions on the promotion of tobacco can reduce tobacco consumption in the general community,^{468, 783} but that this can be undermined by media substitution if tobacco promotion switches from one media form to another. For advertising restrictions to be successful, broad restrictions on advertising and promotion are required.⁹⁴⁴

11.2.2 Maintaining price disincentives

Summary: Evidence for effective dissemination ★★★

It is now established beyond reasonable doubt that overall population-level consumption of tobacco is responsive to the price of tobacco. Increases in price cause decreases in consumption.^{783, 944, 945} Accordingly, it follows that taxation or other

legislative measures can be used by governments to deliberately increase the price of tobacco with the intent of lowering consumption.

The impact of these policies is not evenly distributed across the population. Women and young people display the largest reduction in consumption.⁷⁸³ There is concern, however, that among the poorest groups, increases in pricing can cause financial hardship for those who do not modify their consumption.^{468, 783}

Reductions in consumption associated with price increases appear to consist of a reduction in absolute prevalence of smoking (through reduced initiation and increased cessation) as well as reductions in levels of consumption among smokers. Significantly, there is tentative evidence that around half⁹⁴⁵ to two-thirds⁴⁶⁸ of the impact of price increases is on smoking prevalence rather than simply on levels of consumption. Some evidence suggests that large increases in price will have a greater proportional reduction in consumption than small increases in price.⁹⁴⁵ Overall, price increases can be an effective means of encouraging population-level reductions in overall consumption and smoking prevalence.

The heightened impact of price controls on the prevalence of youth smoking has been taken to imply that sustained and substantial increases in cigarette prices through taxation appear to be the single most effective method of achieving long-term reductions in population-level smoking.⁹⁴⁵ An Australian study of tobacco use by school-aged children in NSW and WA found a 10% increase in the likelihood of being a smoker for every extra packet of cigarettes the student's weekly income allowed them to purchase when other key variables were controlled for.⁴⁵³ The main limitation to the benefits of price controls via taxation is the stimulation of black market sales. Recent customs data indicate a substantial increase in black market cigarette sales in Australia¹⁸² which may have been stimulated by increases in tobacco excise rates associated with the introduction of the GST in July 2000.

11.2.3 Health warning and control pack design

Summary: Limited investigation ○

Since 1969, State legislation has been in place to require a health warning on cigarette packages. These warnings were strengthened, in 1985 and 1992, with requirements relating to the size of the warning, explanation of the warning, details of

Quitline contacts and information on nicotine, tar and carbon monoxide contents. There is some evidence of small reductions in consumption in Australian smokers after the introduction of stronger health warnings on cigarette packets, in 1995.⁹⁴⁶

11.2.4 Working with the tobacco industry

Summary: Limited investigation ○

In 1982, a voluntary agreement was reached between the Australian Government and tobacco manufacturers on the levels of tar, nicotine and carbon monoxide permitted in cigarettes.

11.2.5 Tobacco programs in Indigenous communities

It has been suggested that Indigenous communities should be given the power to control or regulate the sale of tobacco for themselves,⁴⁶⁸ as some do with alcohol. This has not yet been attempted, but appears broadly consistent with the principles of prevention programs in Indigenous communities and with the evidence that advertising and promotion restrictions are effective in non-Indigenous populations. These two factors suggest that such interventions are likely to be effective.

11.3 Alcohol

11.3.1 Restricting alcohol promotions to young people

Definition: The marketing of alcohol and tobacco is carefully conceived and has often promoted images appealing to young people. This has led, in many countries, to restrictions or bans on tobacco and alcohol advertising and sponsorship.

Summary: Warrants further research 📄

Australia removed all tobacco advertising by 1995. Although the marketing of alcohol has not been as strictly regulated, industry codes prohibit products and images designed to explicitly appeal to children and young people. As new products are introduced through marketing, such as caffeine drinks, the need to reconsider marketing regulations is increased.

Advertising is an important method used by the alcohol industry to promote its products. A number of studies have investigated the impact of alcohol marketing and distribution on adolescent health. Well-conducted longitudinal studies in New Zealand^{1947, 948} have found that adolescents who have

greater exposure to alcohol advertising, and also enjoy the advertisements, are more likely to drink in a risky fashion as young adults. However, a comprehensive US review⁹⁴⁹ suggests these effects are slight, and identifies six studies of advertising restrictions and young people's drinking with either negative or inconclusive results. Responding to growing concern about evidence for increased alcohol use and related harms by young people, a World Health Organization technical advisory group met recently to review the latest evidence and prepare a draft WHO declaration advising member countries to ensure young people are adequately protected from alcohol promotions.⁹⁵⁰

One potentially successful harm reduction strategy is that of encouraging lower alcohol beverages. Consumption of low alcohol beverages may be an effective method of reducing acute harm. In a randomised trial, the alcohol content of beverages was varied at parties attended by young people. This study demonstrated that the amount of beverage consumed did not alter in the low alcohol condition and consequently youth BAC was lower upon leaving the party.⁹⁵¹

11.3.2 Restricting the supply of alcohol in the general community

Definition: Reducing the availability and supply of alcohol is a significant part of effective alcohol policy.

In compiling this section, we have drawn solely on review studies.^{152, 186, 188, 524, 775, 952-961} The evidence base cited here represents the collective results of an extensive, systematic, highly rigorous worldwide research agenda and many of the conclusions contained herein can be made with a high degree of certainty. The strength of the evidence for each individual strategy is indicated.

A longstanding issue in alcohol policy, and particularly in relation to supply reduction, is the issue of targeting the general population as opposed to only targeting high-risk groups of heavy drinkers, or alcoholics. Illustrating what is known as the 'prevention paradox',^{11, 529} there is strong epidemiological evidence that the majority of occasions of acute alcohol-related harm affect the majority of drinkers, whose average intake can be described as low-risk.^{530, 531}

In fact, closer examination of this issue reveals that:

- a common pattern of occasional sessions of heavy alcohol intake occurs among people whose average daily consumption is low-risk,

- a significant proportion of alcohol intake in Australia involves drinking at risky or high-risk levels for acute harm—estimated to be 51% of alcohol consumed by the Australian population aged 15 and over,¹⁵¹
- when risky patterns of alcohol consumption for acute and/or chronic harm from drinking are combined, this comprises as much as 67% of total alcohol consumption.⁹⁶²

In each case, the above estimates are from the 1998 NDSHS, which underestimates actual consumption by over 50%.¹⁵¹ Australia's new National Alcohol Guidelines now define risky and high-risk drinking both in terms of *average* daily consumption (for harms caused by long-term heavy drinking) and also amount consumed on any one day (for harms caused by the acute effects of alcohol intoxication).⁴² As such, the 'prevention paradox' effectively disappears, at least for acute alcohol-related problems since these are almost entirely caused by risky or high-risk sessional drinking.^{530, 531} The large contribution of risky and high-risk drinking to total per capita consumption helps explain the close association sometimes found between per capita alcohol consumption and rates both of acute and chronic alcohol-related harm.⁹⁶³ These associations have also been evident in the National Alcohol Indicator reports on patterns of alcohol-related harm and per capita consumption in Australia, across both time and jurisdiction.^{151, 386, 456, 964, 965} It follows that measures which reduce the overall consumption of the entire population are likely to have a positive impact on risky and high-risk drinking and, hence, on the amount of alcohol-related harm in the community. It also follows that measures that reduce the amount and frequency of risky sessional drinking will impact on total population consumption. This 'whole of population' approach is a substantial underpinning of supply reduction policies in regard to alcohol. For policy application, it has been pointed out that justifying supply reduction policies on the basis of reducing per capita consumption of alcohol alone invites scepticism from those unfamiliar with the epidemiology of alcohol-related harm.⁹⁶⁶ A firmer foundation is to seek to reduce risky and high-risk drinking, whilst noting that such drinking patterns comprise the great majority of alcohol consumption in contemporary Australia.

Within this framework, various approaches have been used to reduce the supply and availability of alcohol to the community with the intent of reducing overall levels of alcohol consumption and/or risky alcohol consumption. We briefly review each of the main measures below.

11.3.3 Alcohol taxation

Summary: Evidence for outcome effectiveness ★★

It is established beyond serious doubt that (all other things being equal) increases in the price of alcohol usually lead to an overall reduction in consumption, and decreases in the price usually lead to an overall increase in consumption.^{775, 959} This has been demonstrated by several systematic reviews of the international literature.⁷⁷⁵ Whilst the size of the effect varies for different countries,⁹⁵⁹ different beverages (e.g. beer consumption is usually less responsive to price changes than is wine or spirits), the direction of the effect is highly consistent.⁷⁷⁵ There are also numerous studies reporting that price increases result in subsequent reductions in level of alcohol-related harm.⁷⁷⁵ Some evidence exists that higher beer excise taxes reduce the frequency of youth drinking and the frequency of heavy drinking in youth.⁹⁵⁹ There is also evidence that beer excise taxes are highly effective in reducing fatal traffic accidents.⁹⁵⁹

For these reasons, many have proposed that taxation and other measures of influencing price (e.g. bans on price discounting—see below) should be used to modify consumption levels and reduce overall levels of alcohol-related harm. In relation to taxation, the impact on retail prices of a tax change cannot be guaranteed and, on occasion, may not be passed on at all to the consumer.

Collaborative international research has demonstrated that increasing the sale of low alcohol beer is associated with a reduction in alcohol-related road crashes.⁹⁶⁷ Other Australian research has shown that lower levels of alcohol-related violence and hospital admissions are found in communities with relatively high levels of consumption of low- and mid-strength beer as a proportion of all beer consumed.⁹⁶⁸ Accordingly, recent moves by the Australian Government to reduce taxation rates on low alcohol beer are likely to result in a reduction of overall levels of alcohol-related harm, as a result of taking market share from higher strength brands.

It has been found that drinkers will sometimes adapt to price increases so as to maintain their alcohol consumption at the same cost, by changing to cheaper brands or types of drink. However, overall consumption is still lowered even in the face of such substitution.⁹⁵⁹

There is also a fear that price increases will reduce the beneficial effects of moderate alcohol consumption, though neither the beneficial effects, nor their diminution in this circumstance, are

supported by the evidence. There is a fairly broad consensus in the medical community that low levels of daily alcohol consumption are beneficial to health. The concern has been expressed that raising the price of alcohol will, therefore, reduce the benefits. However, it is not certain that price controls do reduce beneficial drinking. Heavier and younger drinkers usually respond more to price controls than other drinkers⁹⁶⁹ and these groups do not tend to experience any health benefits from drinking. In general, supply reduction measures impact more on young and high-risk drinkers.⁹⁷⁰ Furthermore, while the major health benefit of moderate drinking is thought to be a protection against heart disease, there is no relationship between population levels of alcohol consumption and levels of heart disease.⁹⁶³

There has been significant attention from public health advocates in Australia to the relativities of tax rates across different beverage types.¹⁸⁸ At present in Australia, taxation on beer and spirits partly reflects the actual alcohol content of these drinks as they are subject to an alcohol excise tax directly proportional to the amount of alcohol they contain. Wine, by contrast, is excise-free and is taxed only on its wholesale value, and its retail price through the GST. This has resulted in a major local market for cheap bulk (cask) and fortified wines, which have been shown to be strongly associated with community levels of alcohol-related violence and hospital episodes.⁹⁶⁸ As a consequence of taxing policy, rates of taxation on cask wine per standard drink, are about five times lower than on low and mid-strength beer.

As with the use of tobacco excise to reduce smoking, there is a concern that large increases in alcohol taxation will stimulate a black market for alcohol. There is also clear evidence that increasing the price of alcohol is one of the least popular of prevention strategies. The 2001 NDSHS found that only 20.5% of the general public supported the idea of increasing the price of alcohol to reduce harm.⁹⁴² Previous surveys of public opinion have found clear majority support for hypothecated taxes, that is, specific taxes earmarked for treatment and prevention purposes.⁹⁷¹

Hypothecated taxes on alcohol to fund treatment and prevention programs

Definition: Hypothecated taxes collect revenue that is directed towards a specific purpose or purposes. A hypothecated tax on alcohol can be used to raise funds for treatment and prevention purposes. New Zealand currently collects such a tax to fund an Alcohol Advisory Council. Between 1992 and 1997,

the Northern Territory collected a 'harm reduction levy' of approximately 5 cents per standard drink in order to fund the Living With Alcohol program. Constitutionally, only the Commonwealth Government can now raise hypothecated taxes on alcohol.

Summary: Evidence for effective dissemination

..... ★ ★ ★

The full effect of this tax increase was passed on directly to the consumer. The levy was used to fund a comprehensive range of measures including media campaigns, increased alcohol treatment facilities and community-based prevention; known collectively as the Living With Alcohol program. Overall, there was a 22% drop in per capita alcohol consumption over the four years following the introduction of the levy. This was associated with a substantial and significant reduction in alcohol-related road deaths (39%) and serious road injuries (35%).⁹⁶⁴ The authors of that report argue that the increase in the price of alcohol due to the levy was one factor contributing to these dramatic reductions in harm. However, it is no longer possible for State and Territory Governments in Australia to introduce such harm reduction levies since such taxes were ruled as unconstitutional in a landmark High Court decision, in 1997. Only the Australian Government can introduce such policies.

11.3.4 Physical availability controls

Definition: Physical availability refers to the likelihood that individuals will come into contact with opportunities to obtain alcohol in their local environment.

Overall, physical availability has tended to increase in developed countries over the past 20 years.¹⁸⁶ In general, it is well established that manipulating any of the main aspects of physical availability (outlet density, outlet trading hours, sales to minors, and service to intoxicated customers) causes changes in patterns of alcohol consumption and alcohol-related harm. However, as always, there are important qualifications to each approach to controlling availability, and local variation is an important issue. To a greater extent than with most supply control issues, physical availability is primarily a local issue, though policies at the State or Territory level can certainly facilitate opportunities for effective local regulation.¹⁸⁶

A recent review of the international evidence concluded as follows: 'Do reductions in availability reduce alcohol-related problems? While the answer to this question is usually 'yes', it is also sometimes

‘no’, depending on the local context’ (p701).¹⁸⁶ This conclusion applies to each of the examples of alcohol availability outlined below, and reflects the reality that there are numerous variables affecting the levels of alcohol consumption and related harms in a community, of which level of availability is only one. Furthermore, some forms of increased availability, for example, increasing the number of relatively small licensed premises that provide food and high quality alcohol, may actually reduce harm by diverting customers from higher risk venues.

11.3.5 Outlet density

Summary: Warrants further research 

At the local level, such as individual suburbs, the level of outlet density is highly predictive of levels of alcohol-related harm.¹⁸⁶ However, this knowledge has not, as yet, been developed into an evidence base on how the manipulation or control of outlet density can be used to reduce alcohol-related harm. The local impacts on one problem (e.g. violence) may be different to the impact on another problem (e.g. car crashes) in relation to the areas where the reduction in problems will occur.

Some authors have raised concerns about basing policy on this literature base, as yet.⁷⁷⁵ The effects of modifying outlet density appear to vary according to the type of alcohol product; and, not surprisingly, levels of alcohol-related harm vary with different types of outlet.⁷⁷⁵ However, the overall evidence base remains clear that outlet density is a powerful driver of levels of consumption and harm.¹⁸⁶ There is a need to develop and test a practical model for approving liquor licences so as to maintain a balance between meeting consumer demand and addressing public health and safety issues.

11.3.6 Outlet trading hours


Summary: Evidence for outcome effectiveness ★★

Large, broad changes in trading hours (e.g. whole days of sale added or taken away) are associated with significant changes in overall level of harm, although not necessarily with overall levels of consumption. There is recent Australian evidence that even small changes (e.g. later hours) can be associated with a significant local-level impact on alcohol-related violence.⁹⁷² Recent research in NSW has identified that licensed premises with the highest levels of violence are far more likely to be those that trade between midnight and 3am.⁹⁷³

A recent Scandinavian experiment involving allowing nightclubs to move from one am closing to all-night trading resulted in a much higher level of problems presenting to police and emergency services.⁹⁷⁴ Some Australian licensing commissions treat extended trading hours as a privilege that is granted or withdrawn according to whether licensees are thought to be operating responsibly. This approach assumes adequate monitoring of a large number of individual premises to be in place, whereas in reality information systems are ill-equipped for such demands and rarely include data on alcohol harm incidents.⁹⁷⁵

11.3.7 Responsible service

Definition: Responsible service policies involve a variety of different approaches, usually aimed at reducing the chance that patrons will become intoxicated. These include ‘house policies’ such as promoting food and non- or low-alcohol alternatives, as well as training staff to identify early signs of intoxication and delay or stop service as appropriate.

Summary: Evidence for outcome effectiveness; when accompanied by enforcement ★★
Evidence is contra-indicative; without enforcement 

It is well documented that continued service to intoxicated patrons is a significant risk factor for patrons experiencing alcohol-related harm.⁵²⁵ Generally, if responsible service programs are supported by management, and implemented, they tend to be effective at reducing levels of intoxication and in reducing the chance that drunk patrons will be served.⁹⁵⁷ Various programs have been trialled whereby bar staff have been trained in responsible service practice. Some training programs resulted in behavioural change and some did not. This was not just a function of the training program itself: behavioural change was also associated with managerial support and local enforcement of the alcohol service laws.⁵²⁴

The existence of laws prohibiting service to intoxicated customers on their own have no deterrent effect in the absence of credible and visible enforcement strategies. There is an international literature indicating that such laws are rarely enforced by police and are consequently frequently ignored by alcohol retailers.^{186, 525} It is well established that monitoring and enforcement of the laws is required to result in behaviour change in retailers leading to reduced serving of intoxicated people.⁵²⁵ Profit is a powerful incentive for retailers to disregard the laws. As all Australian jurisdictions

have responsible service laws in place, encouraging responsible service is usually more a matter of enforcing existing laws than creating new ones.

11.3.8 Price discounting

Summary: Evidence for outcome effectiveness ★★

Happy Hours and similar alcohol price promotions cause a rise in consumption and do so in a way that is likely to cause increased risk of intoxication.⁹⁵⁹ Accordingly, such practices have been discouraged in many Australian localities, often through the mechanism of a local community Accord (see below) or directly under instruction of a liquor licensing authority. There is a sound theoretical basis for banning discounting of alcohol, and also some direct evidence that such interventions contribute to harm reduction when part of an Accord package (see below).

11.3.9 Licensee codes of conduct (e.g. Accords)

Definition: Negotiated agreements between police, licensees and local councils covering standards of service and promotion, for example, banning practices such as heavily discounting drinks; often known as Accords.

Summary: Evidence for outcome effectiveness; when accompanied by enforcement ★★
Evidence is contra-indicative; without enforcement ☒

Accords are a uniquely Australian phenomenon. The idea emerged from the pioneering work of Ross Homel and colleagues,⁵²⁴ and originated in Queensland. There are now some published evaluations of these community-based interventions, though only one is published in the peer reviewed literature.⁹⁷⁶ Evaluations of these methods suggest significant reductions in alcohol-related violence in the short term but difficulty in sustaining gains after a few months.⁵²⁴ To be fully effective over the longer term, the policing of licensed premises must incorporate elements of traditional enforcement as well as the development of voluntary codes of conduct. These local approaches can be seen within the broader context of the global move over the past two decades towards alternatives to centralised 'command and control' approaches to regulation, and an increased emphasis on local negotiation and monitored self-regulation.⁹⁷⁷

11.3.10 Dram Shop laws

Definition: An established body of law and principle whereby those harmed by intoxicated persons have, under certain circumstances, the right to sue the licensee of the premises where they served alcohol to the intoxicated person concerned. These laws, which operate in US and Canada, are usually known as Dram Shop laws.

Summary: Evidence for implementation ★

The American literature suggests that there is some modest deterrent effect of Dram Shop laws.⁹⁶⁰ The underlying rationale of deterring service to intoxicated customers is sound and there is no likelihood of adverse consequences. However, their uptake is limited in Australia by the widespread use of public liability insurance, and the low probability of litigation being successful.

To date, Australian courts and legislation have not acted to establish principles for civil action regarding alcohol service,⁹⁵³ although it has been shown that existing legal principles contain the potential for successful civil liability action. A review of Australian liquor laws determined that, whilst by 1996 there had been no successful civil cases based on liability for serving customers to intoxication, some out-of-court settlements had been made. The review noted that Australian attitudes about individual responsibility and the use of alcohol may limit the scope of alcohol-related civil liability.

11.3.11 Restricting the supply of alcohol in Indigenous communities

Definition: Indigenous communities have taken two main approaches to reducing the supply of alcohol: declaration of 'dry' areas, and use of liquor licensing legislation to extend controls on availability. Other communities have established their own 'wet canteens'. Some groups have also lobbied for changes in licensing legislation because the legislation has been seen to be biased in favour of the alcohol and tourist industries, limiting the opportunity of communities to make decisions regarding the sale and consumption of alcohol in their midst.^{978, 979}

Declaration of Indigenous communities as 'dry'

Summary: Evidence for outcome effectiveness ★★

Legal procedures enabling Indigenous communities to declare themselves 'dry' vary between jurisdictions. These procedures and their effects, in the NT, WA and SA, have been reviewed by

d'Abbs.⁹⁸⁰ He found that the procedures can be effective but that communities needed support to enforce them and the underlying policies must promote Indigenous control. These findings reflect those of an earlier study by Larkins and McDonald.⁹⁸¹

Licensing restrictions in Indigenous communities

Summary: Evidence for outcome effectiveness ★★

Indigenous groups in the NT and WA—often in coalition with non-Indigenous groups—have utilised liquor licensing legislation to extend the range of restrictions on the availability of alcohol. Restrictions commonly include limitations of hours of sale and banning the sale of wine in casks of more than 2 litres (effectively a price control measure). Evaluations of restrictions have been conducted in Halls Creek⁹⁸² and Derby⁹⁸³ in WA, and Tennant Creek^{984–986} and Curtin Springs⁹⁸⁷ in the NT. Generally, restrictions have been found to be effective in reducing consumption and key indicators of harm, such as hospital admissions and police arrests. They have been most effective when they have been initiated by Indigenous people, conducted as part of broader strategies to address alcohol-related harm, and have had wide community support.^{988, 989}

Many communities in remote Australia have attempted to exercise some degree of control over the availability of alcohol by operating their own licensed 'wet canteens' or 'clubs'. As Brady notes, these had their genesis in the 1960s, following the repeal of legislation prohibiting alcohol consumption by Indigenous people. Initially they were introduced on mission settlements in an attempt to teach Indigenous people to drink in a 'civilised' manner.^{990, 991} Communities have taken various approaches to the operation of canteens, including greater or lesser restrictions on the amount of alcohol that can be purchased.

The Royal Commission into Aboriginal Deaths in Custody reported that many communities expressed concern about the impact of canteens,⁹⁹² and Martin has identified potential conflicts of interest between attempts by community councils to control consumption and their dependence on canteen profits as a source of income.⁹⁹² As d'Abbs notes, the operation of canteens has both risks and benefits for communities and, echoing a recommendation of the Royal Commission into Aboriginal Deaths in Custody, stresses the need for communities to be assisted in minimising the risks.⁹⁹³

11.4 Pharmaceuticals

Definition: Various measures to limit the recreational use and misuse of pharmaceuticals have been adopted.

The major drugs of concern are prescribed benzodiazepines and narcotic analgesics; although it should be noted that excessive use of OTC medications by some young people is a source of concern. Another area of concern among young people is the diversion of medications (primarily dexamphetamine and methylphenidate) prescribed for ADD and ADHD. Most accounts of this diversion are anecdotal, and it is not known whether there are specific interventions to limit it.

Monitoring and education to prevent 'Doctor Shopping'

Summary: Evidence for implementation ★

One way to limit inappropriate levels of access to prescription drugs has been through the Doctor Shopping project, which is managed by the Health Insurance Commission (HIC). 'Doctor shoppers' were defined as people who visited 15 or more general practitioners, had 30 or more Medicare consultations, and obtained more PBS prescriptions than appeared to be clinically necessary, in a single year. When the project commenced in January 1997, HIC employed pharmacists in each State capital to visit people identified under this program and counsel them about overuse of prescribed drugs. The aim of the project is to improve health outcomes for these patients, reduce unnecessary visits to medical practitioners, and reduce unnecessary use of PBS medicine.⁹⁹⁴ HIC data show that in 1995/96, 13 240 people met the description of a doctor shopper. By 1999/ 2000, this number had fallen to 8780. Of the total PBS medicines obtained by doctor shoppers, 36% were benzodiazepines, 15% were codeine compounds and 8% were narcotic analgesics.

The Doctor Shopping project will move into its second phase following a review of the first three and a half years of the project and will continue to focus on PBS usage.⁹⁹⁴ No evaluation of the program, other than the reduction in number of doctor shoppers identified, appears to be available.

Rescheduling temazepam

Summary: Evidence for implementation ★

An alternative approach to limiting the availability of prescribed drugs is by changing the scheduling under which drugs can be prescribed. Mood altering prescription drugs are frequently diverted

from medical to recreational use, often by injection. Benzodiazepines are among the prescription drugs most frequently diverted in this way, and temazepam has been one of the most preferred for injecting because it has been available as soft, gelatine liquid filled capsules.⁹⁹⁵ The 'heroin drought' in Victoria from late 2000 has been associated with the a marked increase in the injection of temazepam capsules.⁹⁹⁵

In the United Kingdom, temazepam capsules were rescheduled and banned from being prescribed, in January 1996. It was found that despite substitution of other benzodiazepines, there was less frequent injecting and consequent net gain in health.⁹⁹⁵ Other approaches trialled before capsules were removed included education and information for doctors and pharmacists in order to restrict access. However, these approaches failed despite a significant and continued effort over time.⁹⁹⁶

In Australia temazepam capsules have been moved to Schedule 8 of the Drugs, Poisons and Controlled Substances Act in order to reduce their use by injectors. Schedule 8 refers to 'controlled drugs', whose manufacture, supply, distribution, possession and use are restricted for the purpose of limiting their use or misuse and physical and psychological dependence on them.²⁰⁰ Temazepam (10mg capsules, in the 25 pack size) now requires an authority prescription under the Pharmaceutical Benefits Scheme²⁴⁷ and it is hoped that this will reduce their availability to injecting drug users. The rescheduling of flunitrazepam (Rohypnol) to Schedule 8 in 1998 (see below) was effective in dramatically reducing the number of flunitrazepam prescriptions and its availability to the injecting drug user market.⁹⁹⁶ This experience, along with the UK success in reducing the availability of temazepam, suggests that the intervention will be effective.

Rescheduling flunitrazepam

Summary: Warrants further research 

Flunitrazepam, as noted above, was placed on Schedule 8 in 1998 because of its association with drug-assisted sexual assault.²⁰⁰ The 1999 IDRS reported that flunitrazepam availability in the black market, and use by injectors, had declined since the previous survey although it could still be obtained illicitly.²⁰⁰ There is no current evidence as to whether the schedule move has reduced the incidence of drug-assisted sexual assault.

11.5 Volatile substances

Definition: Most Australian States make the sale and distribution of inhalants and volatile substances subject to criminal penalties in certain circumstances.⁹⁹⁷

Whilst legislation varies from State to State, in many it is an offence for a person to sell a deleterious substance to another person if there is reasonable cause to believe that the other person intends to use the substance for the purposes of intoxication.⁹⁹⁷ It should be noted that, across Australia, there is no uniform definition of volatile substances. In some States, the definition is according to the type of product, whereas in other States the definition may be according to the chemical components

There are various legal provisions relating to the control of volatile substances across Australia.

- In South Australia, the Government has power to make regulations with regard to the production, manufacture, distribution, packaging, sale, prescribing, possession and storing of volatile solvents.
- In Western Australia, legislation allows for Indigenous communities to make bylaws against petrol sniffing and other forms of inhalant abuse within their community lands and boundaries.
- In South Australia and the Northern Territory, similar provisions in relation to Indigenous communities to those in Western Australia have been enacted.⁹⁹⁷

Restricting volatile substances

Summary: Evidence for implementation ★

There are divided views as to the efficacy of initiating laws aimed at suppliers and distributors of volatile substances and associated by-products.⁹⁹⁷ In the UK, it was found that laws aimed at prosecuting and restricting suppliers of volatile substance products had not reduced volatile substance abuse but had resulted in a switch from glue to butane, which was more dangerous. Other possibilities include restricting the sale of products containing volatile substances to people over 18, as with tobacco and alcohol. This approach has been taken in the UK with the sale of butane lighter refills, but there is, as yet, no evaluation on the effectiveness of that measure.⁹⁹⁷

There are problems associated with restricting sales of volatile substance products to juveniles, including the huge range of products that can be

used, the possibility that if products can not be bought they will be stolen, and the need to work cooperatively with traders in the industry. In Western Australia, a Retailers Resource Kit has been developed which is aimed at supporting businesses to restrict the sale of solvents and to take positive action regarding the availability of solvents and other substances; but no evaluation of this approach appears to be available.⁹⁹⁷

Whilst all Australian States have adopted standards for the scheduling of drugs and poisons, the compounds and products used by young people tend to be either exempt from scheduling or located in the schedule subject to the least restrictions. There have been calls for butane and toluene, among other substances, to be scheduled in this way, and for health warnings to be displayed on packaging and containers. In the UK, health warnings on aerosol products have been positively received by marketers.⁹⁹⁷

Controls on the supply of petrol in Indigenous communities

Summary: Warrants further research

Indigenous communities have used supply reduction strategies to reduce petrol sniffing and related harm. In communities in Central Australia and Arnhem Land, aviation fuel—which does not have the same psychoactive effects as petrol—has been substituted for petrol.^{233, 888} Again, this has been most effective when introduced in conjunction with other interventions. However, its effectiveness can be compromised when petrol remains available from other sources.²³³ Another measure to reduce availability has been to lock petrol supplies in communities, but this has had virtually no success.²³³

In the Ngaanyatjarra Lands in WA, and the Pitjantjatjara Lands in SA, sniffing or supplying petrol for sniffing has been made illegal. It is also illegal to supply petrol for sniffing in the NT. No formal evaluation of these measures has been conducted, but anecdotal evidence suggests their effectiveness is equivocal—particularly as petrol is widely available and the sanctions themselves do not act as a strong deterrent.²³³

11.6 Performance and image enhancing drugs (PEDs)

Definition: PEDs include anabolic and androgenic substances (steroids), and hormone preparations.

Most of these drugs are available only on prescription and some, like DHEA, cannot be imported without a Commonwealth Government permit. Considerable attention was paid to the supply of these drugs in 2000/01 because of the Sydney Olympic Games.¹⁶⁸

PEDs seizures

Summary: Limited investigation

The number of PEDs seizures has been increasing since 1994/5. During 2001/02, Customs make a record 1630 seizures of PEDs, which represented an increase of over 28% on seizures in the previous year.¹⁶⁵ Steroids were the most frequently seized drugs; seizures generally involved small quantities, mainly for personal use. Many of the substances are legally available overseas and are frequently ordered over the internet and mailed to Australia. Almost all (86%) seizures in 2000/01 were through the postal stream, reflecting this trend, but some larger seizures (e.g. 10kg, 2.4 kg, 250 vials) were also made.¹⁶⁸

CHAPTER 12: REGULATION AND LAW ENFORCEMENT OF ILLICIT DRUGS

12.1 Summary

In this chapter, legislative and regulatory interventions to prevent and reduce the use of illicit drugs are reviewed. The chapter opens with a consideration of evidence that law enforcement, by reinforcing community values against illicit drug use, plays an important role in prevention. In its discussion of law enforcement and regulatory programs in the community, this chapter distinguishes ‘supply-side’ from ‘demand-side’ law enforcement to reflect the role that supply reduction and demand reduction play in Australian drug policy. It is recognised, however, that these are somewhat artificial constructs, with overlapping domains. The control of illicit drug use is primarily aimed at users, to reduce their demand for drugs; and at suppliers, to reduce the availability of illicit drugs. Australian programs and activities aimed at reducing supply and demand are described and evidence for their effectiveness reviewed. For the most part, Australian and international research reviews, rather than primary studies, have been used. In the main, there has been limited research and evaluation in Australia in this area. Some US initiatives show promise, particularly in targeted policing. Further investment is required in the development of integrated monitoring data sets, as well as research and evaluation, in both Australia and the United States is required.

Intervention	Strength of evidence	Nature of evidence	Comment
Role of law enforcement in reducing demand in the community			
Role of social norms in shaping illicit drug use (declarative)	⊕	Empirical evidence is slight because of methodological difficulties; evidence from other areas of crime suggestive of effect	Informal social norms are powerful but separating formal from informal controls is methodologically complex
Role of social norms in shaping illicit drug use (general deterrence)	⊕	Sound theory, hangs on perceptions of likelihood of arrest; one Australian study with limited support	
Role of social norms in shaping illicit drug use (specific deterrence)	0	Unsupported by the existing evidence	
Role of law enforcement in reducing demand among users			
Combined targeted law enforcement and community development	★	National evaluation of US ‘Weed and Seed’ program, which has over 200 sites	Evaluation demonstrated effectiveness but more long-term and cost-effectiveness studies are needed
Use of civil remedies to control drug and disorder problems	★	Randomised field trial of sites in California; program effective in reducing drug but not other offences	Australian trial would need to demonstrate that civil law could operate similarly
Police crackdowns	★	Various studies in USA and Australia; evidence of effectiveness and little of displacement	Unintended negative consequences can occur
Encouraging drug users into treatment	⊕	One Sydney study of 500 users found that drug users rated law enforcement as a motivator to enter treatment	Needs replication particularly in relation to non-heroin drug users

continued on next page ...

Intervention	Strength of evidence	Nature of evidence	Comment
Supply-side drug law enforcement			
Border protection— Australian Federal Police	Ⓜ	Quantities seized; economic evaluation finds return on investment 5.2: 1 but this is not peer-reviewed.	In 2001, availability and use continued to increase (AIDR) while seizures increased
Border protection— Australian Customs Service	Ⓜ	Quantities seized; ANAO evaluation found administrative effectiveness sound	Multiple indicators of supply and demand needed to assess effectiveness; US research shows that efficacy varies with drug type
National Heroin Signature program	Ⓜ	Analysis continuing and results appear good, but no publication	Dissemination mainly in-house to date
Cannabis law reform	★	Comprehensive review of models found little evidence that models influence levels of use; SA experience found no increase in use; no evidence of sending wrong messages	Reduces social harms associated with criminal convictions
Control of cultivation, manufacture and supply of illicit drugs within Australia	Ⓜ	Evidence mainly related to quantities seized, number of charges laid and users' assessments of availability	Better measures to assess effectiveness of activity needed
Asset confiscation	Ⓜ	Law Reform Commission recommended WA approach; WA law is under evaluation	Varies from State to State in principle as well as detail— WA has most radical legislation; no national reporting standards

Key:

- O Limited investigation
- Ⓜ Evidence is contra-indicative
- Ⓜ Warrants further research
- ★ Evidence for implementation
- ★★ Evidence for outcome effectiveness
- ★★★ Evidence for effective dissemination

12.2 The role of law enforcement in reducing demand in the community

Several mechanisms have been proposed to explain the way in which laws shape community values and opinions about illegal behaviours, including drug use. A major review of US illicit drug policy undertaken by the National Academies of Science, Engineering and Medicine, and the National Research Council¹⁷⁶ examined this issue in detail and found that the nature of the link between drug laws and other forms of social controls is a central point of dispute. Generally, there appear to be two major mechanisms by which sanctions against drug users may depress drug use prevalence in the general community: by expressing social norms against drug users (declarative effects), and by dissuading people from using drugs due to fear of apprehension and punishment (deterrent effects).

12.2.1 Declarative effects

Definition: 'Laws against drug use may generate declarative effects by expressing social disapproval of drug use and therefore symbolising and reinforcing social norms against drug use and helping to shape individual beliefs and attitudes' (p191).¹⁷⁶

Summary: Warrants further research Ⓜ

If drug laws reflect community antipathy towards a behaviour, sanctions against that behaviour may generate moralising effects, but in conditions of 'normative ambiguity' sanctions may also generate reactivity in an alienated population.¹⁷⁶ The empirical literature testing these propositions is scant, however, because it is difficult to disentangle declarative effects from deterrent effects and the effects of informal from formal social sanctions. International research relating to tax compliance, theft and drink-driving found that in all three cases

the existence of legal sanctions had a preventive effect on intention to offend, both through the threat of punishment and internalised shame.⁹⁹⁸ Australian research concurs. Braithwaite reported that compliance with the tax system is shaped by broad and relatively enduring factors such as confidence in the regulatory system.⁹⁹⁹ In a study of nursing homes, Makkai and Braithwaite found that respect on the part of a sanctioning agent increased the likelihood of future compliance.¹⁰⁰⁰ No studies, however, have isolated the declarative effect of sanctions against use of illicit drugs from their deterrent effect.¹⁷⁶

Informal social norms play a major role in regulating psychoactive drug use.¹⁰⁰¹ Drug use is powerfully governed by social pressures, or the informal social conventions in people's everyday lives. These conventions vary dramatically and can be highly conducive to using or misusing drugs, or can exert a strong protective effect against drug use.^{176, 397} The interaction of informal norms and formal laws may be a more powerful source of influence on crime than either in isolation.³⁹⁷ These effects are as significant for the young as for adult members of the community.

12.2.2 Deterrence effects

Definition: One of the major explanations for crime avoidance is deterrence theory which asserts that 'undesirable behaviour can be curtailed if punishment is sufficiently certain, swift, and severe'. (p 585)¹⁰⁰²

Summary: Warrants further research 

Deterrence theory assumes that behaviour is instrumental, that is motivated by rewards and punishments. There are two major questions in deterrence theory: to what degree do legal sanctions against drug use deter future drug use (general deterrence), and to what degree does being legally punished for drug use deter future drug use (specific deterrence)?¹⁷⁶ The elements of deterrence are celerity (swiftness), certainty and severity of punishment, although there has been little research on celerity.¹⁰⁰¹ In relation to crime in general, the perceived certainty of punishment appears to be the major driver of deterrence but there is virtually no research on the deterrent effects of criminal sanctions on illicit drug use in Australia. It is unclear whether US research can be applied to Australia given differences in drug policy.³⁹⁷

General deterrence

Some Australian research suggests that the legal status of cannabis use might be a deterrent against use, particularly for those who had never used the drug, but the major element of deterrence does not appear to be fear of police or fear of arrest.¹⁰⁰³ Studies of variations in cannabis law across Australia have found that, contrary to the predictions of classical deterrence theory, there has been no increase in use of cannabis in States such as South Australia, which have moved towards the relaxation of criminal penalties for cannabis use.¹⁰⁰⁴ These results are in accord with those in other jurisdictions that have changed the legal status of cannabis, such as some US States; this kind of research has not been undertaken for studies other than cannabis.³⁹⁷

There is also the question of who is most likely to be deterred: those who have never committed any crime, or those who have committed crimes but avoided punishment? It has been argued that the second category have, by definition, acquired experience with avoiding punishment and that this avoidance of punishment is likely to diminish perceptions of the certainty and severity of punishment.¹⁰⁰⁵ By this argument, deterrence may have its strongest effect on those who have never committed any crimes.

Specific deterrence

Definition: Specific deterrence refers to the degree to which being legally punished for a crime deters future criminal activity.

Summary: Limited investigation 

Specific deterrence appears to be unsupported by the existing evidence. Given the high rate of re-offending among those convicted for illicit drug use, it is difficult to envisage that contact with the legal system acts to deter further use.¹⁷⁶ However, far more detailed data than is currently available would be necessary to adequately answer this question.¹⁷⁶ The strength (or severity) of legal punishment appears to have very little impact on drug use^{176, 397} and studies comparing prevalence of use with the existing legal sanctions find no relationship.¹⁷⁶ Accordingly, there is a lack of evidence to support the widely held notion that harsher sentences will lead to a reduced likelihood of drug use.

12.3 The role of law enforcement in reducing demand among users

Demand-side drug law enforcement is focused at illicit drug users, whilst supply-side drug law enforcement is focussed at sellers of illicit drugs. Demand-side drug law enforcement specifically aims to disrupt illicit drug markets and, by so doing, to encourage drug users to give up or reduce their drug use, often by entering treatment.

The principal goal of drug law enforcement is to disrupt illegal markets.³⁹⁷ One effect should be, by reducing their availability, to drive up the price of illicit drugs. Some have argued that drug law enforcement is ineffective because illicit drugs continue to be available and used; with all the community disruption, crime and loss of public amenity, as well as problems for individuals and their families, that that entails. However, the size that the drug market would be without enforcement cannot be known, and so the true measure of the success of drug law enforcement cannot be gauged.³⁹⁷

Different law enforcement strategies may be needed for different stages of a drug epidemic. Caulkins argues persuasively that interventions early in an epidemic can have a much greater impact on total use throughout the epidemic than later interventions. Law enforcement, because of its immediacy and drug specificity, can be highly effective in curtailing the growth of an epidemic in these early stages, when distribution lines are less robust and can be more easily disrupted. Later in an epidemic there are more addicted users and sellers.¹⁰⁰⁶ He applied this analysis to a comparison of the possible effectiveness of law enforcement against the US and Australian cocaine and methamphetamine epidemics. In the case of cocaine, law enforcement is likely to be less effective in the US where the cocaine epidemic is mature, than in Australia where it is relatively new. In both countries, the methamphetamine epidemics are relatively recent and liable to be strongly influenced by law enforcement.¹⁰⁰⁶

Evaluated approaches to demand-side law enforcement include the combination of targeted law enforcement with community development, the use of civil remedies to deal with drug problems, police ‘crackdowns’, and the role of law enforcement in encouraging illicit drug users to enter into treatment programs.

12.3.1 Combined targeted law enforcement and community development

Definition: These approaches operate within targeted sites and combine partnership development, concentrated law enforcement against drug offenders, community policing to develop trust and cooperation between police and the community, and resources for community program and infrastructure development.

Summary: Evidence for implementation ★

‘Weed and Seed’ is a US strategy to: control violent crime, drug trafficking, and drug-related crime; and to encourage the provision of a safe living environment for residents in targeted areas. It is funded by the Federal US Department of Justice and in 1999, included 200 sites nationwide, most receiving funding of about \$225 000 annually.¹⁰⁰⁷

Weed and Seed mobilises and coordinates resources in high crime communities, aiming to stabilise conditions and promote community restoration. There are two key components of the strategy: concentrated law enforcement to **Weed** out offenders, and community policing to develop trust and cooperation between police and the community; and **Seeding** the community with infrastructure and problem behaviour prevention strategies tailored to its needs. Both aspects require that local residents and agencies work in collaboration with law enforcement.

The national evaluation of Weed and Seed involved eight sites spread around the country and selected for their different Weed and Seed applications. All sites shared high rates of violent crime related to drug trafficking and use, and most had serious gang-related crime problems. Evaluation data included local crime and arrest statistics, interviews with key informants and program participants, and resident surveys.

Although the findings varied across the eight sites, a majority of sites demonstrated a fall in the rates of major property and violent crimes in both years of operation. Drug-related arrests followed similar patterns. Moreover, in most sites these crime rates declined more, or increased less, than in the rest of the city or county. Five of the eight sites exhibited at least some, if not substantial, evidence of improvement in residents’ perceptions of the severity of crime and police effectiveness.¹⁰⁰⁷

The evaluation demonstrated that the two major elements of Weed and Seed—targeted law enforcement and community mobilisation—were the mechanisms for program effectiveness.

However, it was strongly suggested that funding should be concentrated in fewer sites for longer periods to maximise the likelihood that self-sustaining interventions would be developed.¹⁰⁰⁷

Longer-term and more extensive evaluations are clearly needed, as are cost-effectiveness studies, to establish whether this program represents good value for money. Taking the pre-existing differences of evaluated sites into consideration, however, the current evaluation suggests that this may well be a promising approach to the restoration of neighbourhoods and the reduction of drug-related harm.

12.3.2 Use of civil penalties to control drug and disorder problems

Definition: Civil remedies are procedures and sanctions specified by civil statutes and regulations, used to prevent or reduce criminal problems. They typically aim to persuade non-offending third parties to take responsibility and action to prevent or end criminal or nuisance behaviour.

Summary: Evidence for implementation ★

The use of civil remedies to prevent or reduce signs of neighbourhood disorganisation relating to drug use is predicated on the notion that civil remedies are more accessible, through cost and reduced burdens of proof, to frustrated and disadvantaged communities than are criminal penalties.¹⁰⁰⁸ Civil remedies tend to be proactive and preventive, focussing on improving the quality of life. They include pressures on property owners and managers to clean up properties, act on health and safety violations and evict problem tenants. Other approaches include bans, injunctions and restraining orders to prevent potential offenders from criminal behaviour.

A randomised field trial of the use of civil remedies for drug control was held in Oakland, California, using a program called Beat Health, which was created by the Oakland Police Department, in 1988. This program sent teams to troubled sites, providing access to services, advice on citizens' rights and responsibilities, and, where appropriate, legal action against owners of properties with drug problems.

The research included all problem sites referred to Beat Health for three months, in 1995. A careful research design was used to ensure that: there was random allocation to control or experimental conditions, effects on commercial and private properties were differentiated, and that spatial confounding to adjacent areas was minimised. Drug

dealing was reported as a major problem in approximately three-quarters of the locations prior to the start of the research. In the experimental group, Beat Health officers visited all but two of the problem sites and used a variety of tactics to resolve drug and disorder problems. In the control group, city blocks containing problem sites were patrolled and offenders were arrested. The major outcome measure was the number and type of calls by residents for police service related to violent, property, disorder, or drug offences. It was found that the program was effective in reducing calls related to drug problems, although not calls related to the other offence categories. It was suggested that the use of civil remedies could be an important approach to the reduction of drug-related problems.¹⁰⁰⁸

12.3.3 Police crackdowns

Definition: Short intensive burst of police activity designed to move drug users and sellers away from an area.

Summary: Evidence for implementation ★

Crackdowns are situational crime prevention—an approach that considers the nature of criminal events and the settings within which they occur rather than the motivations of offenders. The rationale for situational methods comes from a recognition that offences are not evenly distributed across geographical areas but are found in clusters. Situational crime prevention methods have been applied to the policing of drug markets, frequently in conjunction with locally-based enforcement initiatives or crackdowns. Although these approaches have been applied in the UK as well as in Australia, most of the research literature emanates from the USA.¹⁰⁰⁹

The international literature on police crackdowns and their impact is somewhat inconsistent. While some studies report reductions in drug use, others report no effects; others report increased use.³⁹⁷ Some better-controlled studies have found indications of reduced drug use following crackdowns, but this was accompanied by increased drug use in neighbouring areas. There is also evidence that crackdowns vary significantly in their effectiveness, according to the local characteristics of the area involved and means available to drug market participants to evade the effect of enforcement.³⁹⁷

One well-known American example relates to the Jersey City Drug Market Analysis' experiment.¹⁰¹⁰ Arrest data and community knowledge were used to

map the street-level drug markets, which were then divided into experimental and control groups. The new strategy was applied to the experimental sites and involved information collection, intensive enforcement for periods of a few hours to a few days, and increased police activity, thereafter, to maintain gains. Control groups received no special attention.

The major outcome measure was a comparison of the number of emergency calls made for service at the hot-spot locations during the seven months prior to and following the intervention. There was good evidence that the new strategy reduced narcotics activities, although not violent or property offences, in the localities around the intervention; and some evidence that disorder was also reduced in the experimental sites.

Australian examples of effective police crackdowns can also be given. In South Australia, a problem-oriented operation aimed at street drug markets, called 'Operation Mantle', was successful in limiting the growth of drug-related crime.¹⁰¹¹ 'Operation Puccini' was a police crackdown designed to reduce the illicit drug trade in Cabramatta in 1997.¹⁰¹² The authors of these reports found that the benefits arising from this kind of activity were wide-ranging. Distribution networks can be disrupted and dealers become more difficult to access and, although some displacement may occur, it is unlikely to be total so that overall drug use will be reduced. The dispersal of offenders will contribute to less criminal activity, thereby improving the quality of life for the local community. Increased police visibility also builds confidence in the community so that people use public spaces more and may be more willing to report illegal activity.¹⁰¹²

12.3.4 The unintended consequences of crackdowns

The costs of these policing strategies include the need to ensure there is adequate funding to maintain policing at sufficient intensity for long enough; a possible increase in neighbourhood crime to fund the increased price of illicit drugs following reduced availability; increased opportunities for police corruption; and concerns that the police may be seen as intrusive.¹⁰¹² Police crackdowns in Australia have also been found to result in unsafe injecting practices and increased numbers of syringes discarded by users in a hurry to avoid detection.^{336, 1013} Police efforts to suppress street-level trafficking may inadvertently give rise to predatory crime by user/dealers seeking alternative

sources of income.^{336, 1014} In addition, vigorous law enforcement may unintentionally lead to markets being dominated by more harmful criminal groups who are willing to work in a higher risk environment.¹⁰¹³

Dixon and Coffin investigated 'zero tolerance policing' (ZTP) of illegal drug markets using police operations in Cabramatta as a case study.¹⁰¹⁵ ZTP is modelled on a US program in which police focus on disorder and street offences with expectation of crime reduction, and engage in intensive operations in specific locations. With drug markets, police attention is focussed on street sales with a view to gaining information that will lead to identifying higher level dealers. Dixon and Coffin found that, in general, whilst such crackdowns may produce temporary reductions in activity, attention to high risk people and places does not lead to a sustained reduction in drug-related offences.¹⁰¹⁵

The crackdown in Cabramatta ('Operation Puccini') resulted in increased public health hazards such as: unsafe storage, transfer and injection of drugs, diffusion of markets, harm to police/community relations, and the encouragement of greater organisation in the supply of drugs. There was also an increased likelihood of high-risk injecting practices such as rapid injections, needle sharing and improper disposal of syringes. Furthermore, civil liberties were diminished. Dixon and Coffin concluded that the US ZTP model was not effective for drug-related offences since the US had the highest rate of addiction, drug-related health problems and drug-related crime recorded in the world, and that the role of police might best be seen as regulating, controlling and shaping markets rather than eradicating them.

In relation to displacement of crime from one 'hot-spot' to another because of targeted policing (or crackdowns), the perception in the community that crime will move from one targeted area to another is not supported by the crime literature. Braga, in a systematic review of 'hot-spots policing studies' reviewed nine evaluations—eight in the US and one in Australia—five had randomised experimental designs and four had quasi-experimental designs.¹⁰¹⁶ He found that displacement was quite limited but that there were often unintended crime prevention benefits. Ratcliffe, in an evaluation of Operation Anchorage, a burglary reduction initiative in Canberra, also found that activities of the operation did not significantly displace burglary to other areas;¹⁰¹⁷ and Green has shown that targeted policing of drug dealing does not always lead to displacement of the activity. One outcome,

moreover, is a wider diffusion of benefits to surrounding neighbourhoods such that crime is reduced in neighbouring suburbs.¹⁰¹⁸

12.3.5 The role of law enforcement in encouraging drug users into treatment

Summary: Warrants further research 

The benefits of demand-side drug law enforcement in encouraging illicit drug users into treatment have also been noted. In one Sydney study of over 500 heroin users, it was found that more than 60% of those in methadone treatment rated avoiding more trouble with police and/or courts as an important, or very important, reason for entering treatment. Those not in methadone treatment were more likely to say they wanted to enter treatment if they had been imprisoned for a drug-related offence.⁸³³ The authors concluded that drug law enforcement had a role to play in heroin demand reduction, although ethnicity and previous drug and criminal history were also influential. The readiness of amphetamine-dependent users to enter treatment has not similarly been assessed but is clearly relevant.

12.4 Supply-side drug law enforcement

Definition: The control of illicit drug use through strategies aimed at suppliers of illicit drugs.

The major sources of supply of the most prevalent illicit drugs used in Australia can be seen in Table 12.1.

Table 12.1 Sources of supply of major Australian illicit drugs^{165, 168}

Drug Type	Source(s)
Cannabis	Largely domestically produced although some border seizures of leaf and resin have been made
ATS*	Primarily domestically manufactured although there has been a recent increase of seizures at the border, particularly of crystalline methamphetamine ('ice')
Heroin	Imported from Myanmar and other South East Asian countries
Phenethylamines	Mainly imported from Europe
Cocaine	Imported from South America
LSD	Generally imported from the US
Hallucinogenic ('magic') mushrooms	Grow wild in Australia; there have been some importations, mainly of spore-filled syringes from the US
GHB/GBL	Mostly imported from Canada
Ketamine	A veterinary agent obtained by the diversion of professional supplies in Australia; ketamine powder from China and Singapore has been seized at the border

* Amphetamine-type stimulants

12.4.1 Sources of data in this section

The Australian Illicit Drug Report (AIDR) has been the major source of descriptive material. The three most recent AIDRs are cited unless there are cogent reasons for referring to earlier editions.^{165, 168, 200}

Other sources of descriptive data include reports from Government and non-government agencies—predominantly Australian but also international (including WHO and UN documents)—where applicable.

Evaluative material is far harder to identify (Wardlaw, personal communication). Published journal articles and books—both Australian and international—have been used, along with technical and other reports, to obtain the most complete coverage possible.

An assessment of the strength of the evidence will be made at the end of the section.

12.4.2 Overview of Australian programs and activities to reduce the supply of illicit drugs

Australia absolutely prohibits the supply and use of ATS, heroin, phenethylamines, cocaine, LSD, mushrooms and GHB. In most Australian jurisdictions, the use of cannabis is now dealt with by civil penalty; however, supply of commercial quantities of cannabis remains a serious offence.

In this section, the range of programs designed to reduce the supply of illicit substances to the Australian community (whether by importation or domestic cultivation and/or manufacture) is described, and literature attesting to the effectiveness or otherwise of such programs is reviewed.

The National Illicit Drug Strategy (NIDS) (commonly known as Tough on Drugs) was launched in November 1997. Under this strategy, the Commonwealth has allocated \$213 million over four years to supply control measures.² These measures aim to better resource law enforcement agencies to protect Australia's borders, and the community, from illicit drugs.¹⁰¹⁹

12.4.3 Preventing the importation of illicit drugs

Australia is a signatory to three international conventions that prohibit the trading of a range of illicit substances, including cannabis, ATS, heroin, phenethylamines and cocaine. The aim of these conventions is to restrict the use of drugs to medical and scientific purposes. The conventions require signatories to exercise certain controls over the import, export, manufacture and use of the substances listed in the schedules or tables to the conventions.¹⁰²⁰

The Australian Customs Service (Customs) and the Australian Federal Police (AFP) are the key agencies responsible for implementing strategies to reduce the supply of illicit drugs entering Australia.¹⁰²¹

Border protection – Australian Federal Police

Definition: The AFP has developed programs and methods to combat the illicit drug trade offshore; maintaining that operating offshore, while being logistically complex and expensive, must become more commonplace as the influences of globalisation permeate the region.¹⁰²²

The AFP has an international network of 33 strategically placed officers who provide intelligence links to most of the world's law enforcement agencies. These links allow the conduct of national and international investigations associated with drug importations.

The Law Enforcement Cooperation Program (LECP) is based on the international liaison officer network. It was established using \$5.7 million of NIDS funding allocated over a four year period, from July 1, 1998. The LECP initially involved countries in the Asia Pacific region but is now expanding globally. The ultimate objective of this program is to

strengthen the capability of foreign law enforcement to interdict drug traffickers by providing assistance in the form of training and, in some cases, equipment. These aims are being achieved by funding short-term attachments to Australia and exchanges between Australia and other countries for operational law enforcement officers.¹⁰²²



NIDS funding has also been used for the formation of 10 intelligence-driven, proactive mobile strike teams of AFP investigators, analysts and support staff. These are regarded as the cornerstone of the AFP role in NIDS and are designed to provide long-term targeting of major crime figures to identify, disrupt and/or dismantle syndicates at their international source.

Border protection: Australian Customs Service

Definition: Customs reduce the supply of illicit drugs through intercepting illicit drugs at the border and deterring people from importing or trafficking in illicit drugs.¹⁰²³

Under NIDS, Customs has been allocated \$62 million over the period 1997/98 to 2001/02 for increased surveillance in the Torres Strait and for cargo profiling and examination, cargo examination facilities, communication and IT capabilities, additional intelligence analysts, and increased search capacity.¹⁰²¹

12.4.4 Border protection output evaluation

Summary: Border protection AFP; warrants further research 
Border protection ACS; warrants further research . 

The AIDR reports on border detections for the period 1998/1999 to 2001/02.^{165, 168, 200} Their overall assessment in 2001 was that despite record detections of illicit drugs coming into Australia during 1999/2000, availability and use continued to increase; although some of these drugs, such as cannabis and ATS, are primarily produced domestically. Between 1998/99 and 1999/2000, heroin seizures increased by one-third and cocaine seizures by 145%. Detections of methamphetamine at the border more than doubled and there was increase in the weight of border phenethylamines detections. The number of seized cannabis importations increased although there was a decrease in weight.²⁰⁰

From 1999/2000 to 2000/2001, methamphetamine and phenethylamines seizures increased markedly, but the weight of heroin and

cocaine seizures decreased.¹⁶⁸ From 2000/01 to 2001/02, the weight of Customs border seizures for methamphetamine, phenethylamines, heroin and cocaine increased, markedly so for cocaine.¹⁶⁵ The latest AIDR identified a steady increase in border seizures in both ATS and phenethylamines over the last five years, whereas heroin and cocaine border seizures have fluctuated.¹⁶⁵

The AIDR notes that traditional South East Asian heroin producers continue to diversify into methamphetamine manufacturing. There have been large seizures of methamphetamine tablets in the region, with concomitant concern that these manufacturers will target Australia. However, it is clear that in Australia most ATS are being manufactured domestically. There has been an increase in phenethylamines detections, which can be attributed in part to improved Customs and AFP targeting of higher level phenethylamines importers as well as better links with overseas law enforcement agencies.²⁰⁰

The AFP maintains that its mobile strike teams have had 'an immediate and quantifiable impact' on drug traffickers by reducing supply and disrupting the activities of syndicates. To support this, the AFP points to a total of 1680 kg of heroin, 1520 kg of cocaine, 736 kg of phenethylamines and 458 kg of other ATS seized domestically and overseas, between November 1997 and April 2001. The AFP concludes that, 'the frequency of large seizures has increased markedly since the introduction of NIDS' (p8).¹⁰²² Customs also demonstrates that the number of detections and quantity of drugs seized have increased considerably since NIDS was launched, in November 1997.¹⁰²¹

These outputs have been evaluated both internally and externally. The AFP recently published in its in-house magazine *Platypus* an economic evaluation of a preliminary performance evaluation model.¹⁰²⁴ The model evaluated illicit drug investigations in terms of return on investment, assuming that 'the main benefit to be derived from successful drug investigations is a reduction of supply of illicit drugs to the community and associated reduction in the cost that society bears as a result of drug abuse' (p18). In the absence of better estimates, the street price of drugs seized was used as a surrogate of the economic value of harm associated with drug use, although it is noted that this may be a conservative indicator of the total cost of illicit drug use. Factoring in the investment in drug seizure activities of both AFP and Customs, the return on investment was judged to be 5.2: 1, that is over \$5 was returned to the community for every dollar invested

by the Government. It should be noted that the assumptions and findings of this study have not, at the time of writing, been published in a peer-reviewed journal.

The Australian National Audit Office (ANAO) has undertaken a performance audit of Customs drug detection strategies for air and containerised sea cargo, and small craft activities. The following areas were examined: intelligence and law enforcement cooperation; air and containerised sea cargo; cargo examinations and technology; small craft activities; Customs funding arrangements (including funding for NIDS initiatives); and governance, including performance reporting.¹⁰²¹ It should be noted that the audit did not include Customs work in relation to drugs in the passenger and postal streams. A spokesperson for Customs has informed the authors that subsequent to the drafting of the audit, Customs has increased and enhanced its interventions.

ANAO's overall conclusion was that the administrative effectiveness of Customs' drug detection strategies was sound, but that drug detection strategies would be improved when operational risk management was fully implemented and performance measures to indicate the effectiveness and impact of drug detection initiatives were developed. ANAO found that while it was not possible to accurately assess the quantity of illicit drugs entering Australia, or the drug market overall, traditional supply-side measures of seizures and quantities were flawed indicators of effectiveness reflecting levels of law enforcement activity and could not be used as indicators of the effectiveness of agencies in reducing the supply of illegal drugs. ANAO recommended that multiple indicators of both supply and demand be used for evaluation of effectiveness.

While there seems little doubt that increased detections, both in Australia and through international cooperation in source countries, relate to initiatives made available through NIDS,^{1021,1022} it is unclear whether these increases occurred as a result of: increased total importations, increased law enforcement, both, and/or other influences. The recent heroin 'drought' is a good case in point. There was considerable debate about the causes of the drought. Politicians claimed that the additional resources made available to law enforcement agencies, and the substantial drug seizures that had occurred, presumably as a result of that extra investment, had 'led to a heroin drought in capital cities and a substantial reduction in heroin overdose deaths' (Ellison, p11).¹⁰²⁵ At least one commentator,

however, argued that it was caused by a series of poor opium harvests in Myanmar and the marketing decisions of crime syndicates to promote ATS over opiates in the Australian market, rather than improved and increased surveillance and law activity.¹⁰²⁵ Bush relied on comments made about the heroin drought by senior law enforcement officers, as reported in the media. The AIDR claims that the heroin drought was related, but not wholly attributable, to successful law enforcement both on and off shore.¹⁶⁸ Weatherburn et al. hypothesise a number of possible causes of the drought: increased seizures; arrests of major heroin importers and distributors; and a (water) drought in the opium growing areas of Myanmar.¹⁰²⁶

What this debate does point to, as does the ANAO, is the lack of evidence on which to base claims for the relative effectiveness of one strategy over another. It should be noted that research has now been commissioned to examine the dynamics of the heroin market in Australia, the relationships between the supply, demand and harm reduction components of Australia's National Drug Strategic Framework, and the effects and implications of fundamental changes in Australian illicit drug markets.¹⁰²⁷

Other research projects on the cocaine and phenethylamines markets have also recently been funded.¹⁰²⁸

12.4.5 The National Heroin Signature Program (NHSP)

Definition: The NHSP is a joint project between the AFP and the Australian Government Analytical Laboratories. It is based on the notion that drugs can be identified by their characteristics as being manufactured in a particular part of the world, or even by a particular group or individual.

Summary: Warrants further research 

The purpose of drug profiling is to not only establish the provenance of drug seizures at the level of region, subregion, and manufacturing batch, but also at the distributor level where the illicit drug may be repackaged and concealed. Hence, the program focuses not only on the chemical profile of the seized drug but also on an holistic capture of all the forensic evidence, including physical characteristics of the seizure. This information is then applied at an operational level, often to compare two or more seizures, and at an intelligence level for trends analysis and investigative leads (Robertson, personal communication). In excess of 280 'signatures' have

been analysed, resulting in findings that include the existence of a number of subtypes of heroin within the one geographical location, and the presence of South American heroin in Australia (p16).¹⁰²²

An additional \$4.7 million over four years was allocated in the Commonwealth 2002–2003 budget to extend the drug profiling program to cocaine and ATS.

With respect to evaluation, this is essentially a research program but there has been no publication of the data in the peer-reviewed literature so that the academic community is not able to assess the efficacy of the program. However, the Director of Forensic Services at the AFP states that the data have been applied at the operational level on a significant number of occasions and evidence is being given on the data held in the program on a regular basis—largely in-house (AFP). A number of information releases and posters have been issued and widely disseminated. A street level survey has been completed and reported to the relevant forensic community and workshops held to share information. Whilst there may be a need for further dissemination of information, it is considered that the program is on a par with the best in the world. (Robertson, personal communication)

12.4.6 Restricting the supply of illicit drugs within Australia

Domestic illicit drug law enforcement is mainly undertaken by State and Territory police services. Information about their activities has been primarily gained from the AIDR.^{165, 168, 200}

Summary: Warrants further research 

Cannabis

Cannabis is cultivated on a large scale Australia-wide. A range of groups and individuals are involved, including organised groups said to be particularly outlaw motorcycle gangs (OMCG). During 2001/02, 9801 kg of cannabis were seized, which was an increase on the two previous years. In each jurisdiction there were many seizures with no weight recorded, which makes it difficult to accurately compare the weights and numbers of seizures at the national level. Cannabis is readily available and the price has remained stable, or decreased, across Australia.

Among the initiatives used to detect cannabis grown in Australia is aerial surveillance, which some police services report has led to a decrease in the number and extent of outdoor crops being cultivated. However, hydroponic cultivation of cannabis

continues to increase, with reports that hydroponically grown cannabis has become the most sought-after cannabis among user groups. This has also given rise to observable theft of electricity by cultivators of indoor hydroponic cannabis, in several States and Territories.

Cannabis law reform

Definition: Policies or legislation designed to reduce penalties for cannabis possession and use, thereby also reducing backlogs in the justice system. These include cautioning and/or diversion programs, which are described and discussed in a later section. The other major approach to regulating the availability and supply of cannabis is through changes to its legal status.

Summary: Evidence for implementation ★

Cannabis law reform has been a recent common approach to reducing cannabis-related legal harm in Australia. At the time of writing, the Northern Territory, ACT, and South Australia have all altered cannabis laws in some form or another; Western Australia is in the process of alterations. The reasons for proposing cannabis law reform are grounded in recognition that while cannabis use can be physically and/or mentally harmful, a proportion of the harms associated with its use are primarily related to its illegal status. Aside from the harms to the user, described earlier, enforcement of cannabis laws requires a significant commitment of time and financial resources from the police, the judiciary, and the prison system. The South Australian civil penalty system, for example, demonstrated savings of \$1.4m p.a. over a criminal penalties model.¹⁰²⁹ The widespread use of cannabis, and the existence of a substantial illicit market that aims to fill demand, also brings police into close contact with players in the illicit drug trade. Recent investigations into police corruption in Australia have uncovered examples of cannabis-related police corruption that involves large amounts of cannabis and money.²¹⁵ There is a compelling argument that despite the high financial and social costs incurred by a legislative model where cannabis is illegal, the illegality of cannabis does very little to reduce its use. Thus, the overall harms associated with a criminal model are reasoned to be higher than the overall harms associated with a decriminalisation approach to cannabis legislation.

The 'traditional' model of cannabis legislation, in both Australia and overseas, has been prohibition with criminal sanctions against the use of cannabis. Various differing methods of legislation on cannabis use have been trialled in different locations across

the world. The one most favoured in Australia has been termed 'prohibition with civil penalties' whereby use and possession is illegal but there are no criminal consequences if fines or other civil penalties are paid prior to a due date; large scale cultivation and supply of cannabis remain subject to criminal sanctions.²¹⁵

A comprehensive review of the different models of legislation introduced to regulate cannabis use, both in Australia and overseas, has demonstrated that there is little evidence that changing the legislative environment has had any significant effect on levels of cannabis use.²¹⁵ This was also the conclusion in a cross-national analysis of cannabis use and attitudes, in the Netherlands, the United States and Australia; which found similar patterns and rates of use, suggesting that there was no link between rates of use and social policy.¹⁰³⁰ A comprehensive evaluation of the effect of introducing cannabis law reform in South Australia (SA) in 1987 (the longest running example), found no evidence that changing the law led to an increase in 'population prevalence of recent cannabis use' compared to Australian States that had not changed their laws.¹⁰⁰⁴ On the other hand, research on the SA scheme has found evidence of significant 'net-widening', which occurs as more people are caught up in the legal system than might otherwise be the case, because notices are easy to issue.²¹⁵ Another problem with the South Australian Cannabis Expiation Notice Scheme was that there was evidence from law enforcement sources of syndicates of growers in South Australia involved in the export of cannabis to other Australian States.²⁰⁰ However, these problems appear more to do with the way the SA scheme was implemented rather than a problem with civil penalty schemes as such.

In Victoria, a Cannabis Cautioning Program Pilot (CCPP) was conducted by the police in one district, for the last six months of 1997. Under this scheme, police were able to issue a caution to adults detected in possession of or using a small quantity of cannabis.¹⁰³¹ The evaluation of the pilot recommended it be continued and extended to other police districts throughout the State (Victoria Police, 1998). This took effect in September 1998. An early conference paper noted that 5% of those cautioned had again come to the attention of police within a one month period.¹⁰³² More recently, the Victorian cannabis cautioning scheme has been evaluated as part of the Evaluation of the COAG initiatives on Illicit Drugs. While this report was not available at the time of writing, it is believed that conclusions based on client impacts are limited by very small sample sizes.

A common argument against decriminalising cannabis is that it will 'send the wrong message' and will lead to increases in use. However, this argument is not well supported by the evidence.²¹⁵ Current evaluations of law reform, such as that planned for WA, will need to consider the issues noted above. So, too, will they need to ascertain whether early initiation into cannabis use, which appears to be a significant risk factor in later engagement in antisocial and criminal behaviour,¹⁰³³ is encouraged or enhanced by these legal changes.

ATS

During 2001/02, 240 clandestine laboratories were found in Australia, which represents a steady increase from 1997/98. The majority were found to be producing methylamphetamine with the basic ingredient, pseudoephedrine, predominantly extracted from cough and cold medications. Some concern is expressed in the trend towards small laboratories, which will need greater resources for detection.

Domestic seizures of ATS have increased, with 4861 seizures during 1999/2000, which is an increase of 657 on the previous year. The use of ATS continues to increase and the AIDR maintains that, 'despite the best efforts of Australian law enforcement agencies large quantities of amphetamine are being produced in this country' (p55).²⁰⁰

One approach to restricting the availability of ATS is the control of precursor chemicals. Precursors are starting compounds or ingredients which, when combined with other essential chemicals and reagents, produce illicit drugs. The synthetic drugs produced are predominantly ATS but there are also some opiate-like substances (such as 'homebake' heroin).¹⁰³⁴ All State and Territory police services have now established chemical diversion desks to monitor suspicious purchases of precursor chemicals. These chemical diversion desks also liaise closely with the chemical and pharmaceutical industries in their jurisdictions, in relation to pharmaceutical theft and provision of adequate security.²⁰⁰ A National Code of Conduct, adopted by all States and Territories, places voluntary restrictions on the sale of chemicals used for manufacturing methamphetamines and other psychostimulants and has been in place since 1994. However, only three states (NSW, Queensland and Victoria) have legislation that makes it an offence to be in possession of a precursor with the intention to manufacture a prohibited drug.²⁰⁰

The United Nations Drug Control Programme (UNDCP) notes that since the adoption of the 1988 UN Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances, the licit trade of precursor chemicals has been closely monitored but that the illicit industry's response has been to switch to alternative chemicals that do not fall under the regulations.¹⁰³⁵ In Australia, methamphetamine manufacturers are switching from pseudoephedrine, which has been the commonest precursor, to alternative pharmaceuticals obtained through legal purchase and theft.¹⁶⁸ The fact that pseudoephedrine-based tablets are the most common starting point for clandestine drug laboratories producing methamphetamine has meant that the manufacturers, distributors and pharmacy retailers of these products are now being targeted in every Australian jurisdiction.¹⁰³⁴

Seizures of imported ephedra, ephedrine and pseudoephedrine have been made and, in May 2000, a regime of criminal sanctions for the illegal importation of precursor chemicals was implemented.¹⁰³⁴ There are no current indications that these processes have, as yet, reduced the domestic manufacture of ATS.

Heroin

As has been noted previously, the situation with regards to heroin changed markedly between 1999/2000 and 2000/01. In the AIDR report on the earlier period, it was maintained that 'despite the higher number of heroin seizures of the Customs border and in the various jurisdictions between 1999 and 2000, there is no evidence that heroin availability has diminished' (p36).²⁰⁰ In the later report, they found that the heroin drought had taken hold in almost every State and Territory, with diminished availability and purity and increased price. Concomitantly, heroin offences fell by 34.1% across the country.¹⁶⁸ DUMA data for 2001, however, found that the declines in heroin use were smaller outside of Sydney and the impact was of shorter duration.²⁰² In 2001/02, heroin availability and purity remained low, although some reports indicated that the heroin drought was easing, in the first half of 2002 for Sydney, Canberra and Melbourne. Heroin offences again decreased from the previous year by 56.2%.¹⁶⁵

Phenethylamines

Five phenethylamines producing laboratories were detected in Australia during 1999/2000, two in 2000/01 and none in 2001/02. The AIDR maintains that there were few detected because of the difficulties in both obtaining the necessary

ingredients and the production process.²⁰⁰ There is concern that locally produced 'ecstasy' is more likely to contain a variety of other substances than phenethylamines, including ATS, heroin, ketamine and caffeine.

Cocaine

All jurisdictions other than the Northern Territory recorded seizures of cocaine between 1999 and 2002 but the focal point for cocaine remains NSW. Arrests for use and supply in 1999/2000 were about 30% lower than in the previous year, but increased by 50% in 2000/01. Cocaine offences fell by 6.5% from 2000/01 to 2001/02. Almost all offences were in NSW, a finding supported by DUMA data.²⁰² The AIDR considers that there is a large undetected market for cocaine because, whilst similar amounts of cocaine and heroin are seized domestically, unlike heroin most of the cocaine seizures are made by AFP, suggesting that street traders and dealers are not being apprehended. Cocaine arrests also represent a much smaller percentage of total drug-related arrests than heroin arrests.¹⁶⁸

Other drugs

There is little specific information available about the number of arrests for consumer and provider offences relating to LSD, mushrooms, GHB/GBL and ketamine. There are relatively few domestic detections of hallucinogens, but there are indications that use of hallucinogens is generally increasing. LSD distribution has a relatively low profile in Australia, with most distribution occurring through the postal system. Some police services report that OMCG are involved in distributing LSD in nightclubs and private parties. The availability and use of LSD are stable and low in most jurisdictions, with the drug often taken concurrently with other drugs. Mushrooms are not distributed in Australia on a large scale and are not generally seen as a drug to be sold for profit.

Although there are no data for GHB-related offences, border seizures of GHB have increased significantly, from 3 in 2000/01 to 18 in 2001/02. Use is low and mostly confined to a subgroup of night club patrons. Ketamine hydrochloride is a veterinary anaesthetic and its use and availability is generally low. Ketamine powder from China was seized at the border during 2001.¹⁶⁸

12.4.7 Asset confiscation

Definition: All Australian jurisdictions have enacted legislation dealing with the confiscation of the proceeds of crime. Confiscation legislation in Australia is the subject of review, with some debate around the question of conviction or non-conviction based confiscation.²⁰⁰

Summary: Warrants further research 

There is a debate around the issue of whether legislation requires that criminal activity be proved beyond a reasonable doubt before assets are forfeited (conviction based) or whether proof to the civil standard of the balance of probabilities that the person has committed a serious offence (non-conviction) is sufficient. The WA Director of Public Prosecution, for example, maintains that with non-conviction based legislation, delays in court hearings do not hamper the effective confiscation of criminal property.¹⁰³⁶

In relation to the Commonwealth Proceeds of Crime Act 1987 (POC Act), the Australian Law Reform Commission (ALRC) concluded that a solely conviction based regime failed to meet either the objectives of the POC Act or public policy expectations. As a consequence, it recommended augmenting the POC Act with a civil forfeiture regime enabling confiscation, upon proof to the civil standard, of profits derived from engagement in prescribed unlawful conduct.¹⁰³⁷

New South Wales has a non-conviction based civil forfeiture regime, as does Victoria, although the latter applies only to offences of drug cultivation or trafficking when the quantity of the drug involved amounts to a commercial quantity.²⁰⁰ Western Australia has enacted a non-conviction Act under the terms of which the confiscated assets will be specifically directed to increasing the effort to ameliorate the level and effect of crime in the community.¹⁰³⁶

Other initiatives in the financial investigation of illicit drug offences include those implemented by The Australian Transaction and Reports Analysis Centre (AUSTRAC) to increase the capacity of law enforcement agencies to investigate illicit drugs syndicates using financial intelligence. Some of these are funded under NIDS.²⁰⁰

It is difficult to determine the effectiveness of legislation dealing with the confiscation of the proceeds of crime because there are no national reporting standards.²⁰⁰ In some jurisdictions it is difficult to differentiate the confiscation information corresponding to crime types. It is argued that

uniform legislation would eliminate problems associated with different reporting standards, but a highly committed coordinated national political response would be necessary if uniform legislation were to be implemented. In terms of confiscating the proceeds of crime, an assets removal program would work only if it was accompanied by greater law enforcement capacity to follow complicated money trails.²⁰⁰

In terms of the conviction or non-conviction based confiscation debate, as noted, Western Australia has enacted a non-conviction Act. The WA Director of Public Prosecutions (DPP) reports that, although it is too early to know whether new legal provisions will have a significant impact on the level of crime in the community, it is 'already apparent that the new law greatly facilitates the confiscation of crime use and crime derived property' (p8) and it is forecast that the amount of crime-related property confiscated will increase 'dramatically'.¹⁰³⁶

12.4.8 International and Australian evaluations of illicit drug law enforcement

There is strong international evidence, partly drawn from what is known in relation to other black markets for commodities such as coffee and tobacco, that rendering drugs illegal greatly increases their price.¹⁷⁶ Nevertheless, the 'effective price' of a drug is much more than its retail price—it is a measure that incorporates dollar cost, the time and effort required to purchase the drugs and the risk of being arrested or 'ripped off'. This effective price will vary from user to user and, arguably, will be higher for novices than for experienced users.¹⁰³⁸

Whilst the basic goals of supply reduction and drug law enforcement are to minimise the supply of drugs to illicit markets, and increase the price and inconvenience of acquiring drugs, it is important to recognise that the effects of supply reduction are not equally distributed among different drugs. In the US at the end of the 1980s, for example, a comparison of drug prices to consumption showed that heroin had been successfully controlled in the 1970s; cannabis had recently come under control; but the cocaine problem in the 1980s had not been controlled.¹⁰³⁹

Critically, Moore demonstrated that the drug market changes over time, is geographically specific, and also that law enforcement impacts on different drugs at different points in their production and distribution cycle. For heroin (in the US), the major difficulties seemed to lie in processing, exporting and distributing the drugs rather than getting them

across the border. For cocaine, the biggest difficulty lay in distribution; whilst with cannabis, the greatest difficulty lay in collecting and processing the plants and importing them.

One of the reasons why it is difficult for interdiction to make further gains is the adaptability of smugglers. Interdiction efforts are relatively more important in affecting the price of cannabis than other drugs because interdiction efforts are more successful against bulk shipments in non-commercial vessels. Heroin and cocaine—being less bulky—can be more easily smuggled by air and commercial shipping.¹⁰³⁸ Smugglers, however, responded to this by carrying much smaller loads which meant more effort was required to interdict similar overall quantities.¹⁰⁴⁰

In the early 21st century, the US epidemics of cocaine and heroin addiction have essentially run down. According to Reuter, there have been few new heroin addicts since the 1970s and few new cocaine addicts since the mid-1980s. Neither methamphetamine nor cannabis abuse raises as much concern or has as many consequences as heroin or cocaine use. Heroin and cocaine prices have continued to decline but the perceived availability (by high school students) of cocaine and heroin has not decreased over 10 years. Because of adaptability in the market, there are no signs that more intense enforcement would yield further improvements.¹⁰⁴¹ Once again, the differences between these observations and patterns of drug use in Australia are obvious. Indeed, Weatherburn points out that all drug market modelling to date is based on the US market for illicit drugs and on US levels of investment in drug law enforcement. He maintains that it is unclear whether, and to what extent, the results of US simulation studies on the effects of supply-side drug law enforcement are relevant in Australia given different patterns of illicit drug use—more heroin, more amphetamines and less cocaine.³⁹⁷

In Australia, a number of early studies suggested that illicit drug law enforcement was not cost-effective and did not produce significant impacts on drug markets.^{1042, 1043} A comprehensive two year national review of drug law enforcement throughout Australia concluded that the impacts of criminal justice fell mainly on low-end distributors and users rather than high-level operators, although targeting the latter was the stated objective.¹⁰⁴⁴ Other than current research funded by the National Drug Law Enforcement Research Fund,¹⁰²⁸ there appears to have been no major approach, since 1996, to independently assess the effect of domestic

policing on the supply of drugs (Wardlaw, Sutton and Makkai, personal communication). There is a clear need for evaluators to be able to assess the impact of law enforcement activities on illicit drug supply but as the ANAO notes, whilst traditional measures such as price, purity and availability of drugs are valuable indicators in some respects, they are neither comprehensive nor responsive to changes in drug law enforcement activities. Preliminary research, both in Australia and overseas, suggests examples of indicators that could be used to evaluate the output and outcomes of drug law enforcement activities, but additional performance indicators are required to evaluate the full range of law enforcement impacts on illicit drug markets.¹⁰³⁴

Weatherburn has proposed a set of possible performance indicators for heroin law enforcement which provide a means of assessing police performance in minimising the harm associated with heroin and gauging what police are doing to achieve this objective.¹⁰⁴⁵ In April 2002, the NSW Police published performance indicators for assessing the effectiveness of drug law enforcement, which were developed as an outcome of the NSW Drug Summit in 1999.¹⁰⁴⁶ A number of strategies against which performance will be measured are outlined, including monitoring and assessment. It is not known whether other police services have developed similar indicators but it is clearly an important precursor of overall performance evaluation.

12.5 Research and evaluation needs

The ANAO noted that the Customs and other law enforcement agencies were ‘working in an environment where the size of the market is unknown’ and that:

... there is no national consensus or estimation of the amount of illicit drugs entering Australia or the national drug market overall. Because it is extremely difficult to quantify illicit drug activity, policies and practices are based upon available information and market intelligence. Seizure information used by many organisations to estimate trends and supply is limited to the activities undertaken by law enforcement agencies and does not provide sufficient data for a comprehensive analysis of the market. Information relating to drug users, changes in the patterns of drug use and the demand placed on health care systems must also be considered (p12).¹⁰²¹

The ANAO also recommended that multiple indicators of both supply and demand be used for evaluation of effectiveness.

The readily accessible quantitative supply side data needs to be analysed in conjunction with quantitative and qualitative demand side information. An in-depth statistical analysis needs to be undertaken to ensure that the information relates to the work that has been undertaken. With quantitative performance measures it would then be possible to compare achievements across periods of times and benchmark the activities involved (p117).¹⁰²¹

Additional performance indicators are required in order to evaluate the full range of law enforcement impacts, particularly the extent of disruption and dismantling of criminal enterprises.¹⁰³⁴ Weatherburn notes that there is a lack of adequate drug law enforcement performance indicators, which means that ‘we cannot judge the value of the public investment in DLE’ (p1) claiming that, unlike the UK, little has been done to improve the measurement of drug law enforcement in Australia.¹⁰⁴⁵

Others have also argued that contemporary Australian data sets are inadequate for evaluation and that what is needed is a re-examination of current sources of data to ensure that they are consistent and of high quality, and to encourage policy-relevant research that utilises such data.¹⁰⁴⁷ Data collected for administrative purposes, such as arrest or prison data, are inadequate for research purposes; although uniform crime statistics are collected by the ABS, these are problematic in that they come from police records and can be either victim or incident-based and are dependent on what is reported to, and recorded by, police.¹⁰⁴⁷ These problems make international comparisons difficult. Makkai argues that what is needed is an integrated monitoring system based on national surveys, as well as specialised collections such as DUMA and IDRS, which gather data about drug use and availability from specific populations including arrestees and injectors.¹⁰⁴⁷

There are also difficulties with the reliability and validity of national surveys, such as the NDSHS, for estimating prevalence and trends of illicit drug use. The US Committee on Data and Research for Policy on Illegal Drugs reported that the usefulness of population-based surveys, such as household surveys, is limited if people refuse to take part, or give inaccurate responses. These response problems are particularly severe in the case of illegal activities, including illicit drug use. The Committee determined that response problems in the US Household Surveys cast doubt upon inferences related to both levels of drug use and trends. They found that non-response rates could be as high as 25%, and that assumptions about the levels of use in

the non-responding population could not always be sustained. The problem with inaccurate responding is of a different order because it is not known how large it is. The Committee recommended that a 'systematic and vigorous' research program be set up to understand and monitor non-responding and inaccurate responses in national drug use surveys, and develop methods to reduce non-responding and response errors.¹⁷⁶ In Australia, Makkai and McAllister found that a sealed-booklet format for asking questions about drug use in household surveys produced a more accurate estimate of drug use than direct questions.¹⁰⁴⁸

Large-scale data sets with detailed data on price and purity, based on objective data, are not currently available in Australia or the US. The US Committee was tasked, among other things, with assessing existing data sources that support policy analysis, and identifying new data and research that might enable the development of more effective means of evaluating the consequences of alternative drug control policies. They found that the nation's ability to evaluate its enforcement activities was severely hampered by two major data deficiencies: the absence of adequate data on drug consumption, and reliable data on drug prices.

The central problem is a woeful lack of investment in programs and data connection and empirical research that would enable evaluation of the nation's investment in drug law enforcement. . . . the nation is in no better position to evaluate the effectiveness of enforcement than it was 20 years ago, when the recent intensification of enforcement began (p2–3).¹⁷⁶

The Committee considered that current data collections that involved self-report data of non-representative samples, or that were collected by law enforcement agencies, were not adequate. It recommended that an economic working group be established to develop, test and validate methods and procedures. The results of these efforts should ideally be widely reported in the professional literature and subject to careful review and analysis.¹⁷⁶

This advice in relation to US drug law enforcement is pertinent to Australia. Indeed, one view is that Australia is even further behind than the US in the development of adequate national indicator data for monitoring and evaluation purposes (Makkai, personal communication). This kind of research could be further facilitated by addressing the legislative, ethical and other issues surrounding access by research agencies to the administrative databases held by various government agencies.^{1034, 1049}

A shift towards more detailed evaluation of Australian drug law enforcement has been evident in recent years but the difficulties in doing research and evaluation in this area should not be underestimated. On the one hand, an infrastructure for research into drug-related law enforcement has not been developed in Australia in the same way as has an infrastructure for prevention and treatment research, and, on the other hand, the nature of law enforcement is such that some operations and data have to remain confidential. Recent initiatives include the commissioning of research that, as has been noted above, has largely been undertaken by NDLERF.

Relevant research projects are currently underway or out to tender.¹⁰²⁸

- A study of the mechanics of cross-border trafficking of heroin.
- The Illicit Drug Reporting System (IDRS) expansion (Illicit Drug Users Survey), in 2000/01 and 2001/02.
- The IDRS expansion (amphetamine-type stimulants) in 2000/01 and 2001/02.
- Insertion of drug law enforcement questions in the NDSHS.
- Heroin drought research.
- Cocaine use in NSW and Victoria.
- Benzodiazepine and pharmaceutical opiate misuse and the relationship to crime.
- Development of methodologies to study phenethylamines markets.

The results of these research activities should enhance the scope, depth and effectiveness of the research base that shapes Australian drug supply reduction activities.

12.6 How good is the evidence?

Much of the description in this section is based on the Australian Illicit Drug Report (AIDR). The AIDR is an annual report compiled by the Australian Bureau of Criminal Intelligence (ABCI) (now the Australian Crime Commission) and is the most comprehensive and authoritative description of illicit drug use supply and law enforcement in Australia. The report collates information from State, Territory and Federal police services, other law enforcement agencies, correctional services, forensic science laboratories, Directors of Public Prosecution, the Australian Customs Service, drug

and alcohol research institutions, and drug and alcohol treatment agencies. Much of the information is qualitative and obtained from questionnaires but also contains State, Territory and Commonwealth statistical collections. In 1996, Sutton and James described the forerunner, the Australian Drug Intelligence Assessment (ADIA) to the AIDR thus.

Written explicitly from a law enforcement perspective, the ADIAs have apparently been well received by the enforcement community ... and we have been impressed by the increasing depth and sophistication of the series over the last three years. Indeed, it seems that they are likely to become the standard 'public record' of illicit drug supply and enforcement phenomena in Australia; already academic papers are beginning to cite ADIA as one of their central sources of information ... (p14).¹⁰⁴⁴

Recent AIDRs, now in their eleventh edition, are more comprehensive than they were at the time of that writing. This makes the most recent three editions appropriate sources of descriptive data about illicit drug supply and enforcement.^{165, 168, 200}

The limitations to these data, however, should not be overlooked. As Sutton and James point out, AIDR analyses and conclusions are only as good as the constituent data forwarded by the agencies and, in the main, little attempt has been made to assess how good these are.¹⁰⁴⁴ Moreover, integration of such diverse sources of data inevitably results in some patchiness. Notably, the AIDR relies heavily on reports from police services and there is little or no way to verify these. Makkai notes that police data are based on organisation records and vary considerably across Australia. Offences reported to the police are also a reflection of policing practices, and public actions and values, rather than absolute values.¹⁰⁴⁷

The literature review by Weatherburn *et al.* has also contributed a great deal to this section.³⁹⁷ It does not claim to be a systematic review and no methodology for the selection of studies and commentary articles for inclusion is given; there is little detail about the specific studies reviewed. However, it is comprehensive, covering both international and Australian literature, and the primary author has a major Australian and international reputation as a criminologist and drug law enforcement researcher.

Most of the descriptive and some of the evaluative material in this section has been drawn from public documents, many accessed from web sites. Where internal evaluations are not subject to external review, it is not possible to make judgements about their validity. It is noteworthy that many agencies are now calling for evaluations to be published in peer-reviewed journals, which can only add to the confidence that can be placed in their findings.

CHAPTER 13: JUDICIAL PROCEDURES

13.1 Summary

There is a significant link between alcohol and other drug use, and crime, particularly violence and property crime. The cost to the community of such crime includes the cost of law enforcement and legal and detention costs, which can be considerable. Outcomes such as criminal records can have negative effects on individuals and their families, and recidivism is a continuing problem.

Diversion and other judicial systems, such as drug courts, are designed to improve outcomes for both the community and for offenders who commit drug-related crimes. Diversion involves a graduated series of interventions that are proportionate to the seriousness of the crime. It aims to prevent first offenders from entering the criminal justice system and to divert offenders with drug problems into appropriate treatment.¹⁰⁵⁰ Diversion programs are particularly slanted towards early stage drug-related offenders; late stage offenders may be offered an opportunity to have their offence heard in a drug court, which is a specific example of therapeutic jurisprudence directed towards drug dependence and its outcomes.

The use of diversionary and judicial programs to reduce the demand for drugs is an extension of street-level drug law enforcement. For those who have not been successfully diverted away from drug-related crime, there are a range of programs in prisons to restrict the supply of drugs into the prison, reduce demand for drugs by prisoners, and minimise harmful drug use.

This chapter reviews international and Australian experiences with diversion, drug courts and prison programs. It is noted that many of these programs are relatively recent in Australia and although full evaluations are planned, most are not yet completed. Nevertheless, the evaluations planned, and in some cases implemented, for diversion programs and drug courts are exemplary and should act as models for other law enforcement and judicial evaluations.

Intervention	Strength of evidence	Nature of evidence	Comment
Diverting young offenders into early intervention services	★	Multi-site and longitudinal studies	
Diversion programs in the general community	⊞	Based on sound principles; international literature demonstrates effectiveness; Australian programs not evaluated yet	
Drug Courts	★	Meta analyses of US courts indicate effectiveness; NSW evaluation shows that cost of drug courts is comparable to the cost of incarceration and court is contributing to a significant improvement in the health and wellbeing of participants	Methodological quality of US evaluations a concern; NSW Drug Court has rigorous evaluation process
Programs in prisons			
Drug detection and deterrence	⊞	Mainly limited to counting seizures and positive tests; limited evidence on effectiveness	Vary with jurisdictions; urine testing can lead to more harmful drug use
Differential penalties	⊞	On trial in Victoria and NSW; good theoretical base	Aims to reduce shifts from cannabis to heroin, related to urine testing
Provision of drug treatment (methadone)	★	Methadone evaluated in two programs, one in NSW; in NSW could reduce injecting risk under some circumstances	Rigorous evaluation of MMT in the community

continued on next page ...

Intervention	Strength of evidence	Nature of evidence	Comment
Programs in prisons			
Drug free units	Ⓜ	No Australian evaluations; one US evaluation recommends extension to pre-release programs	Will be incorporated in some jurisdictions
Reward programs	Ⓜ	General evidence base for effectiveness of approach; no specific evaluations	
Education	Ⓜ	No evidence available; peer programs successful in the community	
Transitional support and release preparation	Ⓜ	No direct evidence but sound theoretical base	
Provision of bleach for decontamination	O	No evidence; evaluation in WA is proposed	
Needle and syringe exchange	★	International evidence positive; no Australian experience	

Key:

- O Limited investigation
- Ⓜ Evidence is contra-indicative
- Ⓜ Warrants further research
- ★ Evidence for implementation
- ★★ Evidence for outcome effectiveness
- ★★★ Evidence for effective dissemination

13.2 Procedures for diverting young offenders into early intervention services

Definition: Youths with a high number of risk factors for substance abuse are vulnerable to influences that can draw them into crime. Once engaged in crime, such youths have a higher likelihood of conviction and incarceration. Evaluation suggests that incarceration is not effective at preventing either crime or drug abuse.

Summary: Evidence for implementation ★

There has been some description of police involvement with at-risk young people at a community level in an effort to reduce substance abuse and/or involvement in a criminal gang.¹⁰⁵¹ These authors described a one week program of local police involvement aimed to expose at-risk youths to more appropriate role models, broaden their socioeconomic horizons, and provide them with the experience of financial reward for community-based work. The evaluation of the program suffers from a number of methodological limitations (most notably inadequate description of the sample, non-random selection of the participants, and an inadequate follow-up time frame). The authors did, however, employ

triangulation in an effort to gather data from a range of different sources (e.g. direct observation, focus groups of young people themselves, and surveys of parents and staff). Although the feedback from all sources was generally positive, there was no actual pre- and post-testing of variables of interest. Some outcomes from this short-duration intervention appear unusually positive, raising some doubts as to the level of risk/complexity of the intervention group.

In a large, multi-site intervention aimed at modifying the substance use behaviour of institutionalised young people, Morehouse and Tobler demonstrated at least short-term efficacy of their Residential Student Assistance Program (RSAP) across foster care, juvenile justice and psychiatric facilities, and a broad age range of 13 to 19 years.¹⁰⁵² These authors showed that RSAP was effective in both reducing and preventing alcohol and other drug use across the settings studied. They also established a dose-response relationship, with those young people in the high dose treatment group (i.e. receiving 12 to 30 hours of active intervention) showing significantly better reductions in alcohol and other drug use (as measured both by frequency and intensity of use). Notably, these effects were achieved without any

involvement of the young people's family; however, no long-term data are provided regarding the sustainability of the gains, or the resources required to achieve this.

An investigation that did directly target family functioning in a young offender population was described by Dembo *et al.*¹⁰⁵³ The authors' account of the two year outcomes of a five year longitudinal study showed that their Family Empowerment Intervention (FEI) was relatively more beneficial in cases of serious versus non-serious offending, by reducing the frequency of emotional/psychological problems and the amount of marijuana used. Benefits with respect to marijuana use were also described for non-serious offenders. Again, the long-term sustainability of these gains is yet to be determined.

The US juvenile justice system has mandated entry to family intervention programs, such as Functional Family Therapy and Behavioural Parent Education. Research has demonstrated that the longer-term outcomes of these programs indicate reductions in crime and incarceration. Exploration of similar programs would appear warranted in Australia.

13.3 Diversion programs in the general community

Definition: Diversion programs aim to coerce drug users into treatment and to reduce their contact with the justice system, as the latter may be harmful to low-level offenders.³⁹⁷

Summary: Warrants further research 

This section relies heavily on a literature review prepared by the National Drug and Alcohol Research Centre.¹⁰⁵⁰ Although not a systematic review, it is comprehensive and the major issues and findings have been published in an international peer-reviewed journal.¹⁰⁵⁴

In April 1999, the Council of Australian Governments (COAG) agreed to develop a nationally consistent Diversion Initiative as an early intervention strategy to prevent a new generation of drug users emerging in Australia. The Initiative targets illicit drug users early in their involvement with the criminal justice system. Police, and in some cases courts, divert targeted offenders to compulsory drug education or assessment; from there they are referred to a suitable drug education or treatment program.¹⁰⁵⁵

Diversion programs often target those whose offences are drug-related, as well as direct drug

offenders. As this encompasses a broad and heterogenous client group, a range of responses is required to take into account the nature of the offender's drug use and criminal behaviour.³⁹⁷

Diversion, as a strategy, is based on sound principles. A review of international literature on recidivism found that criminal sanctions had little effect, whilst rehabilitation programs showed small to moderate effect sizes indicating a small reduction in recidivism.¹⁰⁵⁶ It was concluded that for criminal sanctions to reduce subsequent recidivism both treatment and rehabilitation components were essential, and that programs delivered in the community had better outcomes than those delivered in institutions. Diversion of Indigenous people is also consistent with Royal Commission recommendations that custodial sentences be avoided wherever possible.¹⁰⁵⁰

Several issues arise from discussions of diversion, the foremost of which are the efficacy and ethics of coerced treatment. Coerced treatment describes those situations where treatment is offered as an alternative to incarceration or other legal sanctions.³⁹⁷ There are four types of rationale for offering legally coerced treatment.³⁹⁷

- **Reducing illicit drug use and drug-related crime:** there is only a small body of evidence regarding legally coerced treatment and its effects on consumption and crime. However, reviews have concluded that coerced treatment offers similar benefits to non-coerced treatment. Criminal justice clients typically remain in treatment longer than voluntary clients, and as length of treatment has a beneficial impact on treatment outcome, this may be a positive factor.
- **Reduced costs of drug-related crime and law enforcement:** treatment has been found to be more cost-effective than incarceration.
- **Lack of effectiveness of criminal sanctions:** there is little evidence of effectiveness for criminal sanctions in reducing recidivism, or of acting as a general deterrent.
- **Reducing the spread of BBV among prisoners:** prisons are a high-risk environment for the transmission of BBV.

Hall reported that there was no Australian evidence on the efficacy of legally coerced treatment, but that international literature indicated that legally coerced treatment programs could be as effective in reducing both drug use and criminality as voluntary treatment programs.¹⁰⁵⁷ The WHO has concluded

that compulsory treatment is legally and ethically justified only if the rights of the individual are protected and if effective and humane treatment is provided.¹⁰⁵⁸ Coerced treatment should always involve a choice between normal criminal and legal justice procedures and treatment, and the offender should have some choice in the type of treatment they receive.¹⁰⁵⁴

The impact of non-custodial sentences on families has also to be considered. On the one hand, maintaining offenders in the local environment can be counterproductive, either because it could be deleterious for the family to have the offender treated in the community or because families can contribute to the offending behaviour; on the other hand, positive family support from trained professionals can facilitate treatment outcomes.¹⁰⁵⁴

Net-widening occurs when a diversion initiative increases the number of people involved in the criminal justice system, or when offenders receive a more serious sentence if the penalty for failing a diversion program is more serious than the penalty for the original offence. There is little empirical research but anecdotal reports suggest that this can be a problem for diversion programs unless specific steps are taken to avoid it.¹⁰⁵⁴

Evaluating the efficacy of treatment approaches can be difficult,¹⁷⁶ with selection bias and the motivation of offenders to succeed being confounding factors. Another concern is the appropriateness of outcome measures; many research initiatives have considered either drug use or crime as the only relevant variable, overlooking the importance of health, and psychosocial wellbeing.¹⁷⁶ Suggested outcomes for Australian diversion systems include: community safety and law enforcement, economics, health, ethics, and community confidence.¹⁰⁵⁰ General characteristics of effective diversion programs have been identified in a number of reviews.¹⁰⁵⁰

13.3.1 The Council of Australian Governments (COAG) Illicit Drug Diversion Strategy

It is anticipated the Australian Diversion Initiative will result in:

- drug users being given early incentives to address their drug use problem, in many cases before incurring a criminal record,
- an increase in the number of illicit drug users diverted into drug education, assessment and treatment, and

- a reduction in the number of people appearing before the courts for use or possession of small quantities of illicit drugs.¹⁰⁵⁵

The primary target group is individuals who have little or no past contact with the criminal justice system for drug offences and who are apprehended for use or possession of small quantities of any illicit drug. Offenders diverted under the scheme have access to appropriate drug education and/or treatment. Family involvement in the program will be encouraged, where appropriate. If possible, young offenders will have access to youth-specific services and Indigenous offenders should be given the option of attending an appropriate Indigenous agency.¹⁰⁵⁵ A report on diversion programs that are specific to Indigenous people is in draft, but was unavailable at the time of writing.

The Diversion Initiative is being implemented within each State and Territory over a four year period (1999 to 2003) using national criteria for identifying priority targets including: need; demand; presence of special groups, particularly Indigenous Australians; feasibility; and appropriate existing service infrastructure. Reference groups in each jurisdiction will oversee and participate in the implementation of the initiative. COAG provides funding for expanded early intervention treatment and rehabilitation placements and funding for assessment services is provided by both the Commonwealth and State/Territory Governments. States and Territories provide the law enforcement basis for diversion. Commonwealth funding totals approximately \$105 million over four years.¹⁰⁵⁵

The range of programs varies between jurisdictions and it is beyond the scope of this Monograph to describe them, except to note that in all cases there are various programs addressing different levels and types of offending. The suite of programs in each jurisdiction has been developed in line with national principles.

The provision for evaluation and monitoring is integral to the Diversion Initiative. The Commonwealth Department of Finance and Administration (DOFA) has been assigned responsibility for independent evaluation, with assistance from a Steering Committee that comprises representatives of the Australian National Council on Drugs (ANCD), the Intergovernmental Committee on Drugs (IGCD) and key Commonwealth departments. The evaluation is required to advise on the effectiveness of the package in contributing to arresting the growth in illicit drug use, preventing the uptake of illicit drugs by new users, and reducing the damage to

individuals and the cost to the community of illicit drug use.¹⁰⁵⁹

An additional issue is detection of possible negative consequences of the initiative. These might include net-widening, displacement of voluntary clients from treatment services by diverted offenders, pressure to plead guilty when innocent, discriminatory application of programs among subgroups of the population, and effects on treatment service staff coping with difficult, coerced clients.¹⁰⁵⁹

Whilst comment on the effectiveness of this initiative must wait until the evaluation is concluded, the literature suggests that it might well be effective because diversion is based on sound principles and coerced treatment can be both ethical and effective.

13.4 Drug courts

Definition: Drug courts are special purpose courts whose role is to administer cases of people guilty of drug-related criminal offences. The drug court process incorporates an extensive treatment and rehabilitation program, undertaken with the supervision and ongoing management of the court.

Summary: Evidence for implementation ★

This section has been prepared on the basis of reviews of a limited literature primarily related to drug courts in the US. Although there are Australian drug courts in almost every jurisdiction, only one set of evaluations (NSW) is complete.

Drug courts are one of many possible approaches to diverting drug users from the criminal justice system towards treatment, education and rehabilitation approaches.³⁹⁷ Drug courts have become more common around the world during the 1990s. There are various models of drug courts in use around the world but they are likely to have the following features in common.¹⁰⁶⁰

- an integrated approach involving criminal justice procedures, drug addiction treatment, and social welfare programs,
- ongoing involvement with the court,
- frequent substance abuse testing, with sanctions for failing the tests,
- frequent contacts with health and welfare services,
- sanctions and rewards based on the offender's behaviour, and

- the offender has pleaded guilty and a custodial sentence is the likely alternative.¹⁰⁶¹

There are many possible aims of drug courts related to both criminal justice and the therapeutic/rehabilitation process.^{1060, 1061}

These include:

- reducing levels of drug-related criminal activity,
- reducing imprisonment rates,
- reducing burdens on the judicial and correctional system,
- improving the health and psychosocial wellbeing of the participants, and
- reducing or eliminating drug use.

US drug courts were first established in the 1970s, with the first 'modern' drug court being established in 1989.¹⁰⁶⁰ These courts arose in the context of concerns about rising crime and drug use problems, and evidence of continued re-offending despite tough sentencing regimes.¹⁰⁶² As with the Australian experience, the actual form of the courts varies greatly according to the jurisdiction involved.¹⁰⁶²

US courts are typically confined to non-violent offenders whose involvement in the criminal justice system is largely a result of their drug use, and as such, often includes small-scale drug use offences.¹⁰⁶² Many people involved would not necessarily have been drug dependent.¹⁰⁶¹ This is a very different client base to Australian courts, which have tended to deal with clients from the more severe end of the criminality spectrum.

There are two major meta-analyses of the effectiveness of US drug courts^{1063, 1064} that represent the highest quality source of evidence available. The first concluded that in general, drug courts demonstrated effectiveness in reducing drug use and criminal behaviour, for the duration of the program. The second study found that recidivism was lower for participants in drug courts than control groups. However, the second report also demonstrated that evaluations varied greatly in both the nature of the programs evaluated and the methodological quality of the evaluations.¹⁰⁶¹

Australian drug courts have been implemented on a pilot basis in WA, NSW, Victoria, SA, and Queensland. None are yet assured of continued operation¹⁰⁶¹ but political and community support appears to be strong.¹⁰⁶⁰ There are two youth drug courts—in NSW and Western Australia. The WA youth drug court is similar to the adult court, with modifications in respect of length, type and

intensity of treatment.¹⁰⁶¹ The NSW youth drug court is established within the framework of the existing Children's Court and began operating, on 31 July 2000, in two Children's Courts in Western and South Western Sydney. Its aim is to reduce drug use and offending behaviour among young people charged with serious offences where alcohol or other drug use is a contributory factor.¹⁰⁶⁵

The NSW youth drug court is designed as an integrated system, which brings together elements of the juvenile criminal justice system with a range of adolescent service providers. It aims to divert young offenders from custody by addressing holistically the health and welfare issues that are associated with substance use and offending.¹⁰⁶⁶ Interventions can include accommodation plans, case management, individual group or family counselling, participation in education or vocational training, health assessments and programs, recreational programming, urinalysis and court attendance.¹⁰⁶⁶

The evaluation of this court is being conducted by the Social Policy Research Centre at the University of NSW. It consists of five studies including statistical monitoring, implementation review, outcomes study, program cost analysis and legal issues review. Only the second of these, the implementation review, is currently available.¹⁰⁶⁵ It was based on: interviews with 25 key stakeholders and five participants; observations; and document review. It found that the program was operating effectively as a pilot, in that problems were being identified and addressed.

As mentioned above, there are now adult drug courts in NSW, Queensland, WA, SA and Victoria, with the first court commencing in February 1999. Australian drug courts have quite markedly different jurisdictional characteristics.¹⁰⁶¹

The typical features of Australian drug courts (largely based on the US model) include:

- integrated treatment and justice programs,
- collaborative approach between prosecution and defence lawyers,
- early placement in treatment programs,
- drug testing,
- ongoing participation by the magistrate or judge, and
- ongoing monitoring and evaluation.¹⁰⁶⁰

Australian drug courts are aimed at heavy drug users with a substantial criminal record who would

otherwise be facing custodial sentences.¹⁰⁶¹

According to Freiberg, all Australian drug courts have a requirement that the defendant must plead guilty to obtain the services of the court.¹⁰⁶¹

The inclusion criteria are fairly similar across all Australian drug courts.¹⁰⁶⁰ They typically include:

- being drug dependent, and that this contributes to offending,
- likely to be incarcerated,
- living in a certain prescribed area, and
- no history of sex offences, and in most jurisdictions, no history of violent or serious violent offences.¹⁰⁶⁰

The conditions of ongoing participation in the programs are also similar across jurisdictions and include: reduced or eliminated illicit drug use, frequent drug testing, frequent contact with the court, various residential and offending restrictions, and participation in therapeutic programs.¹⁰⁶¹ Each court has its own regime of rewards for appropriate behaviour and sanctions for breaching of conditions.¹⁰⁶⁰

As noted above, there is little evaluative information available to date on Australian drug courts, with the exception of evaluations of the NSW court. The NSW drug court has a rigorous evaluation process, which includes a control group of referred offenders who are randomly allocated to the traditional court process.¹⁰⁶⁰ The evaluation process covers three main areas: (1) cost effectiveness (in contrast to other justice system interventions) and the impact on re-offending, (2) health and wellbeing, and (3) a process evaluation of key aspects of the drug courts functioning.¹⁰⁶⁰

Of the 608 people accepted into the NSW program to March 2002, 446 exited. Of these, 19% successfully completed the program and received a non-custodial sentence; the other 81% were removed from the program and received a custodial sentence; 43% of all those who entered the program were terminated either due to re-offending or other non-compliance with program conditions.¹⁰⁶⁷

The cost-effectiveness evaluation of the NSW drug court¹⁰⁶⁸ appears to have been the first such study of drug courts anywhere in the world.¹⁰⁶¹ There are many possible mechanisms to measure cost. At the broadest range, costs might include health care costs, justice and police costs related to the subsequent rates of recidivism and costs of crime to the victims.¹⁰⁶¹ A narrower view, such as that taken in the assessments of the NSW program, is to

simply compare the cost of drug court participation with the cost of serving the original sentence.¹⁰⁶¹ Even using this narrow criterion, which overlooks many pertinent costs, evaluations of the NSW program found that the average cost for drug court participants was \$144 per day, whereas the cost for the control group of equivalent offenders simply serving out their sentence was \$151 per day.¹⁰⁶⁸ Thus, the cost of drug courts is essentially comparable to the cost of incarceration.

This evaluation also investigated recidivism rates for drug and non-drug criminal offences, using a control group of eligible detainees who did not participate in the program.¹⁰⁶⁸ The only statistically significant differences between the two groups were the time taken to re-offend (in relation to drug offences only) and the rates of offending (for drug offences). In relation to preventing further opiate use, the drug court was significantly more cost-effective than the control group.

The health and wellbeing of participants was also a significant key issue. Freeman reported on the relative health status of participants in the NSW program.^{1067, 1069} It was found that participants were in extremely poor health compared to the Australian population when they commenced their program, but physical health showed significant improvement, up to normal range within 12 months. Social functioning and mental and emotional wellbeing improved, although the latter were still lower than in the general population. Participants also reduced their expenditure on illegal drugs while they were on the program. Importantly, over 60% of participants had their program terminated in less than 12 months. The length of sentence was the only factor predicting treatment retention, with longer sentences being associated with greater program retention.

A major process evaluation of the NSW drug court was undertaken in order to identify the strengths and weaknesses, and outline how these weaknesses should be addressed.¹⁰⁷⁰ Overall, the NSW evaluation data indicates that the court is contributing to a significant improvement in the health and wellbeing of its participants, and a reduction in illicit drug use. The impact on criminality and recidivism is less clear-cut, with the data failing to demonstrate statistically significant reductions in recidivism and criminal re-offending (other than illicit drug use).

Both the Australian and US experiences suggest that initial implementation of a drug court program can be a difficult time.^{1060, 1067} The American literature also demonstrates that evaluations that take place

too early in the process are likely to be unfairly distorted by problems of initial implementation, and will not give a fair picture of the operation of the drug courts.¹⁰⁶¹

A central concern is the issue of the treatment of offenders whose offences involve alcohol rather than illicit drugs. NSW, SA and WA specify that the offender must be, or appear to be, dependent on illicit drugs (excluding alcohol). Queensland merely states that the person must be drug-dependent, without drawing a distinction between licit and illicit drugs. Victoria is the only jurisdiction that has specifically included alcohol-related offences. The widespread exclusion of alcohol is a serious concern in the eyes of some.^{1060, 1061} Many people presenting to the drug court are alcohol-dependent and alcohol has a prominent role in public disorder and violent crime.¹⁰⁶⁰ The exclusion of alcohol from programs is of particular relevance to the Indigenous population. Indigenous people are under-represented in drug courts, despite their over-representation in the criminal justice system.¹⁰⁶¹

Some authors have also raised concerns about the length of involvement in drug courts; while most courts are based on a 12 month program, there is no apparent empirical justification for this time frame.¹⁰⁶⁰ Makkai has suggested that the courts may need to consider longer time frames, which will have significant resource and policy implications.¹⁰⁶⁰

All Australian drug courts are being evaluated and it remains to be seen whether courts in other jurisdictions will have similar outcomes to those found in NSW. It would seem that the opportunity exists for comparative studies to assess which elements, or combinations of elements, of Australian drug courts are the most cost-effective.

13.5 Programs in prison

A variety of strategies are used in prisons to control or reduce the supply of, and demand for, drugs. Many of these include elements of harm reduction. Prison initiatives differ from jurisdiction to jurisdiction but generally include drug detection programs, treatment programs, education and peer support programs and a variety of strategies to minimise harm. In general, little evaluation is available on the effectiveness of these programs.

13.5.1 Drug detection and deterrence programs

Definition: There are drug detection programs in all prisons, typically associated with sanctions when drug use is detected.²⁰⁰ Detection programs include drug sniffer dogs, urine testing, and cell searches.

Summary: Warrants further research 📖

The AIDR summarises reports from corrective service agencies in every Australian jurisdiction on activities designed to reduce the flow of illicit drugs into correctional facilities.²⁰⁰ The range of strategies includes: the use of drug detector dogs, both active and passive, to conduct cell and visitor searches; perimeter patrols; prison searches and barrier controls; intelligence; search and seizure; urine drug testing, both random and targeted; and penalties for prisoners caught trafficking. There are also identified Drug User programs that create incentives for prisoners to reduce drug use by imposing penalties such as loss of contact visits, while encouraging participation in Drug-Free Incentive Programs; drug detection sweat patches; and Prison Health Services prescription and storage protocols for recommended medications.²⁰⁰

There is very limited evidence on the effectiveness of these programs. The Queensland Department of Corrective Services reports that urinalysis data for offenders in custody indicate far less ongoing drug use within correctional centres, as the result of preventive action by staff, than in the community. The NSW Department of Corrective Services describes drug detector dog teams as ‘one of the most effective means of locating drugs’ but there is no quantification of this.¹⁰⁷¹ The South Australian Department for Correctional Services reports on the number of drug searches conducted by the dog squad during 1999/2000 and 2000/01 and their outcomes: recovery of drugs, pills, drug use implements and home brew.¹⁰⁷² In Victoria the percentage of prisoners testing positive for an illicit drug diminished from 4.7% in 1998/99 to 4.4% in 1999/2000.²⁰⁰

13.5.2 Differential penalties for cannabis use

Summary: Warrants further research 📖

The Victorian and South Australian prison systems are conducting trials of differential penalties of cannabis use, such that prisoners caught using cannabis will receive less severe penalties than users of more harmful drugs, in an attempt to limit the extent of switching from smokeable to injectable drugs.^{1073, 1074}

13.5.3 Provision of drug treatment

Summary: Evidence for implementation ★

All Australian prisons offer drug treatment, in some form. However, these appear to be mainly limited to counselling services³⁸⁰ and there is great variation in the availability of access.¹⁰⁷⁵ Treatment in the wider community is generally effective⁸⁰⁴ and prison offers an excellent opportunity to engage drug users in drug treatment programs.³⁸⁰ However, little is known about the actual nature and quality of prison-based treatment services and no evaluations of their effectiveness are available.³⁸⁰

Methadone maintenance treatment (MMT) in prisons is surprisingly rare, given that it is the most effective heroin treatment approach in the general community^{381, 804} and that its effectiveness and relative lack of risk as a treatment modality is no longer seriously questioned.¹⁰⁷⁶ Because of these facts, numerous expert groups, worldwide, have called for its widespread use in prisons.¹⁰⁷⁶ A 2001 research review identified only two evaluated programs, one in New York, and the other in NSW.¹⁰⁷⁶

The NSW prison MMT program began in 1986.³⁸⁰ Evaluations noted that MMT reduced injecting risk behaviour but only with an appropriately high dose of methadone, and only when the methadone was provided for the duration of the sentence.³⁸⁰ Other Australian States offer very limited methadone programs^{1073, 1074, 1077, 1078} and with a variety of restrictions on availability: to specific prisoner groups, such as those who were using methadone at the time of admission, or those who are nearing release.¹⁰⁷⁸ Some systems offer methadone on a compulsory dose-reduction model whereby prisoners with sentences longer than six months have their methadone gradually reduced,^{1073, 1078} which is less effective than maintenance programs.⁸⁰⁴ Discontinuation of methadone treatment while in prison has been shown to be a risk factor for unsafe injection practices.¹⁰⁷⁶

Overall, the limited and often restricted availability of methadone programs in Australian prisons is a concern, as is the provision of ineffective dose-reduction programs in preference to more effective maintenance-orientated programs. It should be noted that the Victorian prison system has recently undertaken to increase the number of prisoners being offered methadone or buprenorphine treatment on a compulsory gradual withdrawal model.¹⁰⁷³

13.5.4 Drug-free units

Definition: Drug-free units provide support, including counselling, for abstinence from drug use. Various incentive and punishment regimes are utilised, usually including a strict no-use criterion. Typically in return for continued abstinence, prisoners gain access to various extra privileges.²⁰⁰ Some jurisdictions have drug-free units and others are considering putting them into place.^{200, 1073}

Summary: Warrants further research P

There are no Australian evaluations; an evaluation of a US Therapeutic Community (TC) within a prison, which is a similar model, suggests that in prison TC alone may not be sufficient and is more effective when followed with re-entry work release TC.¹⁰⁷⁹

13.5.5 Reward programs

Summary: Warrants further research P

There is a general evidence base suggesting that management of behaviour problems in prisons is best accomplished by systems of incentive for positive behaviour, rather than a reliance on punitive responses for negative behaviours.¹⁰⁷⁴ In recent times, some Australian prisons have adopted this strategy to include rewards and privileges as a result of staying drug-free.¹⁰⁷³ While there is no specific evidence of the impact of this policy on drug consumption, there is evidence that at a general level this approach is effective.¹⁰⁷⁴

13.5.6 Education

Summary: Warrants further research P

Education programs on the risks of drug use are frequently offered within Australian prisons.^{200, 1073, 1074} In some jurisdictions, funding is provided for peer support programs within the prison, in light of the success of such programs in the community. No evidence on effectiveness is available.

13.5.7 Improving the environment

Summary: Limited investigation O

Some strategies have proposed that much drug use in prison arises as a response to boredom, despair, separation, and loss of family, friends, and freedom. Policies that aim to normalise the prison experience may reduce stress and, therefore, drug use. These include constructive activities such as education and training, humane and courteous treatment of prisoners, and efforts to humanise the physical environment as much as possible.¹⁰⁷⁴ There is no evidence of the effectiveness of such approaches.

13.5.8 Transitional support and release preparation

Definition: Transitional support upon release from prison that might involve drug treatment agencies and attention to post-release income support, education, employment and health.

Summary: Warrants further research P

Whilst there is no direct evidence for effectiveness, many programs are using these approaches in an attempt not only to improve the chances of released prisoners staying drug-free, but to generally improve the chances for them successfully adapting to life in the community following a period of incarceration.^{200, 1073, 1074} Concerns about the high level of heroin overdose in WA have led to the introduction of a program involving extensive collaboration with external agencies to support prisoners leaving jail, including education on low levels of tolerance and risk of overdose, and to enhance the likelihood that they continue treatment on release.²⁰⁰ No evaluation is available.

13.5.9 Provision of bleach to decontaminate injecting equipment

Summary: Warrants further research P

Bleach is available for sterilisation purposes in some Australian prisons. These programs have been reported to have the potential to reduce risk in regard to HIV/AIDS.³⁸⁰ A major concern, however, is that whilst bleaching injecting equipment may be effective against HIV, it is not known whether it is effective against hepatitis C.¹⁰⁸⁰ A trial of the provision of bleach has been discussed in WA.

13.5.10 Needle and syringe exchange

Summary: Evidence for implementation ★

Needle provision in prisons has been advocated by various groups as a harm reduction initiative. Prison officers have generally been strongly opposed to such programs, threatening industrial action.³⁸⁰ Internationally, there are 19 prisons offering syringe exchange services.¹⁰⁷⁶ Evaluations of these programs have consistently reported that levels of drug consumption either remained stable or reduced,^{381, 1076} syringe sharing was dramatically reduced, there have been no reports of syringes being used as a weapon and only one report of needlestick injury. There were no known incidences of BBV transmission in any of these prisons.^{381, 1076} Implementation typically met with initial staff resistance but, in most cases, once the program was established staff displayed favourable attitudes towards it.¹⁰⁷⁶

13.5.11 Evaluations of prison programs

Current evaluations of prison programs appear to be primarily internal and as yet there do not appear to be independent studies on the effectiveness of these programs in deterring or otherwise reducing drug use in Australian prisons. The Victorian Prison Drug Strategy is planning current and forthcoming research and evaluation which will be: scientifically valid, meet Department of Justice ethical guidelines, and be integrated with existing corrections research and evaluation. Research results will be widely communicated, published for scrutiny in peer review journals and presented at forums.¹⁰⁷³ One initiative is being evaluated by the University of Melbourne's Department of Criminology.

It follows that there is little evidence of benefit from drug testing programs in Australian prisons. Some international evaluation studies have reported that the introduction of testing programs made no difference to consumption levels,³⁸¹ but an English study reported that random mandatory drug testing, which plays a central role in reducing the supply of drugs in Australian prisons, promoted inmates switching from cannabis to heroin use, because cannabis has a much longer urinary half-life than heroin.¹⁰⁸¹ Such a switch, however, raises concerns about injecting and the transmission of blood borne viruses. The switch from smokeable to injectable drugs, as a consequence of random urine testing, is apparent in Queensland where the Illicit Drug Use Action Plan states:

An additional and disturbing aspect of illicit drug taking within prisons is an emerging trend for further adverse effects from prisoners tending to move from using 'soft' drugs which are more easily detected than 'hard' drugs, including those taken intravenously, which are less easily detected (p4).¹⁰⁸²

In Western Australia, an internal evaluation of a pilot program was undertaken to test the operational effectiveness of using sweat patches in a community-based setting. Sweat patches are a way of overcoming some of the problems associated with urinalysis. The pilot revealed that using sweat patches could be an effective tool in managing clients under community supervision, but is conditional on resolution of administrative and operational processes.¹⁰⁸³

13.5.12 Summary

The two main foci in prison drug and alcohol programs are: drug detection and deterrence, and treatment provision. At the outset, it should be noted that prisons can be considered as 'revolving doors' for some drug users. Relationships in the DUMA dataset between arrest, imprisonment and opiate use demonstrate that there is a subset of offenders 'enmeshed in a revolving door through the criminal justice system and heroin use' (p1806).²³⁸ There is little evidence available on the actual impact on inmate drug consumption of most prison policies, other than self-report from the prisons involved.²⁰⁰ Whilst there are noted exceptions, in general, methadone in Australian prisons seems to have limited availability despite its demonstrated efficacy in both the international literature and in the NSW prison system. Deterrence and detection programs are being modified in some jurisdictions in order to address the issue of differential penalties for cannabis, a policy that receives general support from the literature. Deterrence programs appear to work best when accompanied by a corresponding system of rewards for appropriate behaviour.¹⁰⁷⁴ Overall, there is no independent evidence to suggest that deterrence-based programs are effective, with some international research suggesting that they make no impact on consumption levels.³⁸¹

Attitudes and beliefs of staff within the prison system are traditionally described as 'zero tolerance', and in the past this has been an obstacle to provision of demand and harm reduction approaches.¹⁰⁷⁷ Harm minimisation is limited in most jurisdictions to education and peer support programs, methadone maintenance in some prisons, and the provision of bleach for decontamination for which there is as yet no evaluation. The provision of sterile needles to inmates in Australian prisons does not appear to be likely despite there being international evidence that it is not associated with increased drug use, reduces sharing of injecting equipment, and does not appear to give rise to hostile behaviour using needles as weapons. Given the high levels of BBVs, particularly hepatitis C in Australia prisons, it seems that a trial should be considered.

CHAPTER 14: HARM REDUCTION

14.1 Summary

Harm reduction strategies are those that seek to minimise or limit the harms associated with drug use, without necessarily seeking to eliminate use. Such strategies have been part of Australian national drug policy since the first policy was developed. Harm reduction strategies are often thought of mainly in terms of reducing the spread of blood-borne viruses among injecting drug users, but there is a much wider range than this, with initiatives relating to the use of tobacco, alcohol, illicit drugs and pharmaceuticals.

This chapter reviews these strategies, including regulations to reduce passive smoking; approaches to reducing drink driving; thiamine supplementation to reduce alcohol-related brain disease; night patrols and sobering up shelters, particularly in Indigenous communities; the reduction of violence and the effect of violence in licensed drinking environments; reducing opiate overdose and blood-borne viruses, including safe injecting centres and retractable syringes; and limiting harms associated with so-called 'dance drugs' (phenethylamines, LSD and ketamine). Finally, approaches to reducing the use of benzodiazepines in drug assisted sexual assault are reviewed.

Intervention	Strength of evidence	Nature of evidence	Comment
Tobacco harm reduction			
Light cigarettes	O	US Surgeon General report: smokers inhale harder, to compensate	Unlikely to increase harm; concern about misleading promotions
Alternative nicotine delivery systems	Ⓟ	Theoretical case that they could be useful; reports of successful national implementation elsewhere	Swedish experience: snuff has taken market share from cigarettes
Regulation to reduce passive smoking	★★★	Passive smoking clearly toxic; systematic reviews demonstrate that legislation reduces environmental tobacco smoke exposure to non-smokers	Environmental tobacco smoke exposure is reduced
Alcohol harm reduction: drink-driving			
Lower BAC limits for young drivers	★ ^{3/6}	Systematic review reported 3 of 6 primary studies show significant benefits	Some evidence of benefits; evidence base inconsistent
Random breath testing	★★★	Systematic reviews; national implementation, positive impacts	Australia's existing practice is a noted worldwide example of best practice; high visibility and a perception that one will be detected is required
Ignition interlocks	★★ ^{2/2}	Few but large scale studies with positive outcomes and sound rationale	Effectiveness limited to period device fitted to car, re-offending high after removal
Designated driver schemes	★	Sound rationale; modest success in US studies; successful Australian implementation	Some studies have reported compliance problems; modest benefits, no opportunity costs
Alcohol harm reduction: other			
Thiamine supplementation	★★	Known biological mechanism; national implementation; observation of reduced prevalence	Supplementing beer is the most cost-effective strategy NB Cognitive impairments wider than W-K syndrome (section 14.5.2)

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Intervention	Strength of evidence	Nature of evidence	Comment
Alcohol harm reduction: other			
Harm reduction through licensing codes of conduct	★ ^{3/4}	Evidence for short-term reductions in violence in 3/4 studies	Sustainability and possible displacement are a concern; need to combine with genuine deterrence re liquor laws
Staggered closing times	x ^{0/1}	Limited evidence from observations and one intervention only	Increases harm if results in overall extension of trading hours
Plastic (or tempered) glasses	★	No research evidence of effectiveness; anecdotal evidence from remote Indigenous communities of reductions in injuries; sound theoretical rationale	Little potential for adverse outcomes
Food service	★	Known biological mechanism and evidence-based rationale; not specifically evaluated.	Some liquor licenses only permit alcohol service with food
Harm reduction educational approaches	★ ^{1/1}	One well-controlled school-based Australian study	Great potential for wide dissemination
Alcohol harm reduction strategies in Indigenous communities			
Night patrols	⊞	No outcome studies; sound rationale, wide implementation	Strong community support. Significant potential
Sobering up shelters	⊞	Process outcome studies only; well accepted, widely implemented	Strong community support. Significant potential
Illicit drug harm reduction			
Education to users about preventing heroin overdose	★ ^{0/0}	No outcome studies; evidence of acceptance and implementation	
Emergency services and police protocols for overdose (OD)	★ ^{1/1}	Improvements in OD callout rates noted; broadly implemented	
Treatment for opiate dependence	★★★	Analysis of coronial data; RCT studies	Engagement in treatment, especially methadone, protective for OD; concerns re naltrexone treatment reducing tolerance to opiates and increasing risk
Provision of naloxone for peer administration	⊞	Sound theoretical case promising international data but more evidence required	Medico-legal concerns need to be addressed by governments, to support a trial
Needle and syringe distribution	★★★	Cochrane and other systematic reviews; international and Australian literature including economic evaluation	Reduced HIV; no increase in use; hepatitis C still a problem; increased funding gives greater impact; need for better access for Indigenous people
Supervised injection centres	★	Sound rationale; interim Australian evidence suggests lives saved	Australian evaluation underway, only rigorous evaluation of such a centre anywhere
Hepatitis B vaccination	★★★	Strong rationale; widely implemented	Need to improve means of reaching injecting drug users
Retractable syringes	⊞	Weak rationale; comprehensive Australian and international reviews	Initially and superficially appealing; detailed examination of issues suggests that there is no possibility for benefits even if they can be developed
Information campaigns for users of 'dance drugs'	⊞	Sound rationale; no formal evaluation	

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Intervention	Strength of evidence	Nature of evidence	Comment
Illicit drug harm reduction			
Guidelines for provision of safe venues at dance parties/nightclubs	Ⓟ	Harm is often a function of environment such as over-heating; sound theoretical rationale for guidelines	
Pill testing at venues	Ⓟ ^{0/0}	Sound rationale; consumer acceptance; widely implemented internationally; no evaluation	Addresses the major risk factor, at least in part
Pill testing at home	O	No evidence	Some concerns about accuracy of testing kits
Dyes in benzodiazepines (BZs)	O	No evidence; prevalence of BZs in assault unknown	Cannot do harm, plausible rationale
Harm minimisation drug education	Ⓟ	Evidence for effectiveness re alcohol	

Key:

- O Limited investigation
- ⓧ Evidence is contra-indicative
- Ⓟ Warrants further research
- ★ Evidence for implementation
- ★★ Evidence for outcome effectiveness
- ★★★ Evidence for effective dissemination

14.2 Harm reduction in Australian drug policy

Since the mid 1980s, the stated aim of Australia's national responses to drug use, The National Campaign Against Drug Abuse and the National Drug Strategic Framework, has been one of 'harm minimisation'. Until the late 1990s, this was defined as an approach that:

aims to reduce the adverse health, social and economic consequences of alcohol and other drugs by minimising or limiting the harms and hazards of drug use for both the individual and the community, without necessarily eliminating use (emphasis added) (p4).¹⁰⁸⁴

In its review of the 1998 National Drug Strategic Framework, from 1998/99 to 2002/03, the Australian Government restated its commitment to 'harm minimisation' but couched this as policies and procedures that aim to reduce drug-related harm and improve health, social and economic outcomes by employing a range of measures including: (1) *supply reduction* strategies aimed to disrupt the production and supply of illicit drugs; (2) *demand reduction* strategies designed to prevent the uptake of harmful drug use, including abstinence-oriented strategies to reduce use; and (3) a range of targeted *harm reduction* strategies designed to reduce drug-related harm for particular individuals and

communities.¹³ This separation of the terms harm reduction and harm minimisation was partly a political re-emphasis of the importance of supply reduction and abstinence approaches in Australia's national strategy.

Despite these definitional changes, it was evident that from the mid 1980s to the mid 1990s, the main focus of harm reduction or harm minimisation in Australia, and elsewhere, was on reducing the harm of drug use itself, particularly that associated with injecting drug use and the transmission of HIV/AIDS.¹⁰⁸⁵ However, in their review of the *National Drug Strategy*, Single and Rohl saw one of the key underlying principles of the harm reduction approach as that, in reducing drug-related harm, consideration should also be made of the 'unintended harms which may result from the drug control strategy itself' (p47).¹⁰⁸⁶ Recent introduction of cautioning schemes for illicit drugs in all Australian states and territories (except cannabis in jurisdictions where civil penalties apply), is in part reflective, if not a consequence of, this recognition of the need to consider the harms caused by drug control strategies themselves.

Australia's pragmatic response to drug policy has been internationally recognised, mainly for its success in minimising the spread of HIV among injectors, their sexual partners and the general community.

14.3 Tenets of harm reduction

The main goal of harm reduction is to reduce drug-related harm, rather than the use of drugs *per se*. 'Use reduction may be a strategy to achieve harm reduction but when the goal of an intervention becomes the reduction of use, then a program, policy or intervention should not be described as one of harm reduction' (pp51–2).²¹⁵

Harm reduction strategies assume that many people will continue to use drugs and do not require, necessarily, that this use is ceased. Harm reduction approaches concern the harms that are associated with continuing drug use, and attempt to reduce these harms.

Lenton and Single have noted that in recent times there have been at least three main uses of the term harm reduction in the drug research literature: (1) narrow definitions, which only apply the term to policies and programs (such as needle exchange) that aim to reduce the harm for those who continued to use drugs; (2) broad definitions which include any policy or program that aims to reduce drug-related harm; and (3) empirical definitions, which limit the use of the term harm reduction to policies and programs where a reduction in harm can be empirically demonstrated.¹⁰⁸⁷ Having articulated the shortcomings in each of these definitions, these authors offer an alternative socioempirical definition.

A policy, programme or intervention should be called harm reduction if, and only if:

- (1) *The primary goal is the reduction of drug-related harm rather than drug use per se;*
- (2) *where abstinence oriented strategies are included, strategies are also included to reduce the harm for those who continue to use drugs; and,*
- (3) *strategies are included which aim to demonstrate that, on the balance of probabilities, it is likely to result in a net reduction in drug-related harm (p219).¹⁰⁸⁷*

14.4 Tobacco

There are few strictly harm reducing policies relating to tobacco, because the broad consensus is that there is no safe level of use. The only harm reducing strategies in the literature relate to low tar or 'light' cigarettes, supposedly safer alternatives to smoking cigarettes. These include snuff and nicotine nasal sprays, and measures to reduce passive smoking by non-smokers.

14.4.1 Light cigarettes

Summary: Limited investigation O

The US Surgeon General has raised concerns about low tar and so-called 'light' cigarettes.⁹⁴⁴ It has been found that smokers used to mid and high tar cigarettes tend to compensate by inhaling harder if given a low tar cigarette to smoke. Terms such as 'light' and 'ultra light' are misleading in that such cigarettes are not necessarily any less harmful to consumers. There appears an implied promise of reduced toxicity in such promotions, and there have been proposals to regulate against misleading promotional terms, but no trace of the latter could be found.

14.4.2 Alternative nicotine delivery systems

Summary: Warrants further research P

Some authors have proposed that other, less harmful nicotine delivery systems could be an effective harm reduction strategy for tobacco.¹⁰⁸⁸ Given that a proportion of the harm from smoking is associated with smoke inhalation, some have proposed that products may be developed in the future that allow delivery of nicotine to smokers without the need to inhale smoke. Australia has a national policy of not encouraging the development of safer alternatives to cigarettes for fear that these may encourage non-smokers to take up the habit, or ex-smokers to relapse. By contrast, Sweden has permitted the sale and promotion of a type of tobacco for nasal ingestion ('snuff'), which has taken a significant market share away from tobacco cigarettes (Simon Chapman, personal communication). There is some concern that such products may increase the risk of cancer of the mouth but this is likely to be less of a serious health issue than lung cancer.

14.4.3 Restrictions to prevent passive smoking

Definition: A diverse range of legislative and regulatory approaches, worldwide, that have the effect of restricting smoking in public places in order to prevent passive smoking.

Summary: Evidence for effective dissemination ★★

Systematic reviews have demonstrated that, generally, these interventions appear to accomplish their aim of preventing smoke exposure in certain environments,⁹⁴⁴ and thereby act to reduce passive

smoking in public places.^{468, 783} The protection of non-smokers from the effects of environmental tobacco smoke, by restricting the places where smoking is permitted, is clearly a harm reduction measure.

Clean-air regulations contribute to a different social climate regarding the acceptability of smoking, and this may indirectly influence the prevalence of smoking⁹⁴⁴ but there is no direct evidence that these regulations reduce overall smoking prevalence. Public support for such legislative and regulatory approaches appears to be high, even among smokers.⁹⁴⁴ There is no evidence of adverse consequences resulting from such policies and support for them is generally high.⁹⁴⁴ Enactment of such policies is simple, effective and inexpensive.

14.5 Alcohol and harm reduction

Drinking to intoxication is a major contributor to short-term harm from alcohol, and accordingly, there are many policies aimed at reducing the harmful impact of intoxication. As outlined previously, the harms related to alcohol can often stem from the acute consequences of one session of intoxication, and this is an especially predominant problem in the younger population. It has recently been estimated, on the basis of the 1998 NDSHS, that 90% of all alcohol consumed by 18 to 24 year old Australians was consumed in a manner that placed the drinker at risk of acute and/or chronic harm from alcohol.⁹⁶² Reducing levels of intoxication is discussed earlier in this document. In this section, we present the methods and approaches that aim to reduce the levels of harm to those already intoxicated. In addition, some interventions, such as thiamine replacement, seek to reduce the impact of long-term chronic alcohol consumption.

14.5.1 Drink-driving policy

There are a number of approaches that are effective in reducing drink-driving mortality and morbidity. Four main strategies have been used.⁹⁶⁰

- **Reducing overall levels of consumption:** a strong effect of reducing population-level, or local-level, consumption of alcohol is a reduction in alcohol-related crashes. Reducing overall consumption has been discussed earlier.
- **Separating drinking from driving:** this includes advertising and promotional campaigns, increasing use of public transport, designated driver programs, and similar initiatives. There is little direct evidence for either the effectiveness, or the lack thereof, of such approaches.

- **Removing drunk drivers from the road:** this includes a variety of approaches, including sobriety tests, breath testing, training police in identifying drunken drivers and similar programs. In the Australian context, this mainly involves random breath testing (RBT).
- **Preventing recurrence:** preventing drink-drivers from repeating their offences is another key approach. This includes specific deterrence effects of fines and legal sanctions for offenders, the jailing of repeat offenders, and other programs such as interlock devices.

The diversion of drink-drivers into brief treatment interventions, usually based on educating the offender about ways of avoiding drinking and driving, is widely practiced in the US.¹⁰⁵⁷ A US review of such diversion programs found a modest effect of an 8 to 9% reduction in repeated drink-driving offences,¹⁰⁸⁹ although individual evaluations tend to be hampered by lack of, or inadequately matched, control groups. Nevertheless, a recent review of the effectiveness of court procedures applying to drink-drivers found that diversion to educative and treatment interventions and incapacitation were the most effective means of reducing drink-driving recidivism, when compared to punishment via incarceration and fines.¹⁰⁹⁰

Lower BAC limits for young drivers

Definition: Because of the increased likelihood of fatalities in teenage and younger drivers,⁹⁶⁰ many places throughout the world have trialled and researched lower maximum permitted BAC levels for young and probationary drivers.

Summary: Evidence for implementation ★ ^{3/6}

The evidence base for the effectiveness is tentative but it appears that having a lower permitted BAC for young drivers reduces risk of fatalities. A systematic review identified six studies, of which only three reached significance.⁷⁷⁵ One of the studies reporting significance claimed that the effect was the most powerful for a BAC limit of 0, and effectiveness was reduced for limits of 0.02 and 0.04 respectively.⁷⁷⁵

Random breath testing

Summary: Evidence for effective dissemination ★ ★ ★

Random breath testing has been shown to be effective, in Australia and the US.⁷⁷⁵ It reduces fatalities, injuries and crashes. A key factor in the success of RBT is the principle of general deterrence. For RBT to be effective in preventing people from driving drunk, it requires that there is a

public perception that there is a high chance of being caught.^{186, 1091} In Australia, this has been achieved by a combination of high-visibility policing (roadblocks, 'booze buses') and frequent public advertising campaigns emphasising the likelihood of drink-drivers being detected.

A Cochrane review concluded that random screening (a broader definition than RBT) was effective in reducing fatalities and injuries from road crashes.⁷⁸³ The review also determined that the community perception of being caught may be a key factor in the success of such campaigns. Australia's screening program (RBT) was singled out for being particularly successful, in comparison to other nations. The success of Australia's RBT program is attributed to the way it is implemented, including the fact that all stopped drivers are tested, community perceptions of the chance of being caught is high, and high intensity of implementation.

Ignition interlocks

Definition: Ignition interlock devices require drivers to provide a breath sample before starting their vehicle. Interventions where drink-driving offenders are required to have such devices fitted to their cars have been trialled in a variety of jurisdictions, internationally.

Summary: Evidence for outcome effectiveness ★★^{2/2}

Although the evidence base is relatively small, it appears that the fitting of ignition interlock devices reduces the risk of re-offending, while they are fitted. A systematic review identified only one randomised controlled trial on this issue, which reported a relative risk of re-offending of 0.36 for the group with interlocks.⁷⁷⁵ Re-offending is often an issue after the interlocks are removed.

Furthermore, drivers will frequently only accept having an interlock fitted if the alternative is prison or a heavy fine.⁹⁶⁰ However, during the period that the interlock is fitted, there is strong evidence that re-offending is at extremely low levels.^{1092, 1093}

Designated driver schemes

Summary: Evidence for implementation ★

Various locations around the world have run promotional and educational campaigns on designated driver schemes. The evidence base is limited, however, and a US review concluded that such strategies are not particularly effective in producing behaviour change.⁹⁶⁰ However, an Australian evaluation of a designated driver

intervention for young adults, known as Pick-a-Skipper, was shown to at least achieve its basic aim of persuading a significant number of young drinkers who were intending to drive to and from their location of drinking, to select non-drinking drivers as 'skippers', before they began consuming alcohol.^{851, 1094} This finding is also replicated in the international literature, which reports a rise in the prevalence of designated drivers, as measured by roadside surveys, from 5% to 25% between 1986 and 1996.⁹⁶⁰ The US literature has also reported that in a sample of 600 people convicted of drink driving, 'many' had identified a designated driver, and this driver reneged on the agreement and as a result, 'drunk-driving' took place. Australian studies have reported that 26% of respondents appointed as designated drivers had driven in this role while under the effects of alcohol.¹⁰⁹⁵ Studies of US establishments with designated driver programs (offering free soft drinks) found that participation was low.⁹⁶⁰ The evidence base is weak and firm conclusions cannot be drawn. However, it is hard to sustain an argument that providing free soft drinks to drivers can increase the risk of drink-driving and it is likely they contribute, to a limited degree, in reducing risk. Since the cost of such schemes is borne by the retail alcohol industry, there is no opportunity cost of recommending such schemes.

General issues with licensing and licensed venues

Across a diverse range of contexts, it has typically been shown that self-regulation of licensed drinking venues in the absence of traditional law enforcement is ineffective.¹⁰⁹⁶ Where practice is regulated by law (not serving under age patrons, not serving intoxicated patrons, restrictions on discounting), regulatory enforcement is generally required to create compliance. The liquor market is fiercely competitive and it is often profitable to violate the regulations. For example, it is difficult for one hotel to comply with a no-discounting approach while their competitors host crowded 'happy hours'.⁵²⁴

A generally recommended policy has been partnership approaches that include industry consultation in program design, in conjunction with legal frameworks providing deterrence to violation of regulations.⁵²⁴ Intelligence-driven policing has also been recommended, based on the repeated findings that a small minority of licensed venues is associated with the majority of incidences of alcohol-related harm.^{973, 975}

14.5.2 Thiamine supplementation

Definition: Wernicke-Korsakoff's syndrome is a form of serious brain damage primarily caused by long-term heavy alcohol use. A substantial part of its causation is a thiamine deficiency brought on both as a direct consequence of heavy consumption of alcohol over many years, and as an indirect result of the poor diet typically associated with heavy alcohol consumption. Prevention is possible with thiamine supplementation.

Summary: Evidence for outcome effectiveness ★★

There are two main contenders for thiamine enrichment—bread-making flour and alcoholic beverages. In 1991, Australia decided to supplement flour with thiamine. Thiamine fortification of beer and flagon wine rather than bread was originally recommended by the NHMRC, in 1987, but opposition from government and nutritionists led to the compromise position of supplementation of bread.¹⁰⁹⁷ However, Wernicke-Korsakoff's syndrome occurs mainly in alcohol dependent drinkers, and as beer and bulk wine (casks and flagons) is the preferred beverage of patients with Wernicke-Korsakoff's syndrome, beer and bulk wine supplementation is more likely to improve thiamine intake in heavy drinkers than supplementation of bread.¹⁰⁹⁷

A number of arguments for and against the supplementation of different products have been presented, including the concern that alcoholic beverages might be promoted and seen as 'health foods' if they were supplemented with thiamine, and this might impact adversely on overall consumption.¹⁰⁹⁸ Against that is the concern that the diet of very heavy drinkers is so poor that they are unlikely to obtain enough thiamine through food alone.¹⁰⁹⁹

Australian work reviewed by Ludbrook indicates that thiamine supplementation of beer would be a cost-effective way of preventing the incidence of Korsakoff's syndrome.⁷⁷⁵ It was found that the most cost-effective method was fortifying full-strength beer; the second most cost-effective involves supplementation of beer and cask and flagon wines; whilst the least cost effective method was fortifying bread-making flours with thiamine.¹⁰⁹⁹ This research utilised dietary and drinking histories to estimate potential benefits from the three various supplementation approaches, in terms of reducing Wernicke-Korsakoff's. However, there is suggestive evidence from studies of hospital admissions, that thiamine supplementation of bread in Australia in the late 1980s led to reduced prevalence of Wernicke-Korsakoff's syndrome over time.¹¹⁰⁰

14.5.3 Staggered closing times for bars and clubs

Summary: Evidence is contra-indicative ☒ ^{0/1}

As noted previously, there is strong Australian evidence that changes to trading hours can significantly impact on levels of violence in and around licensed premises.⁹⁷² Violence is often associated with closing times of drinking venues in entertainment areas, believed to be associated with the gathering of large numbers of intoxicated people in the same physical space.⁵²⁵ For this reason, authors have proposed that staggered closing times may reduce violence by reducing the potential for large numbers of intoxicated people to gather. Other complementary measures proposed have included ensuring efficient transport is available to remove intoxicated patrons, and more extensive police monitoring of locations with a great number of licensed premises.⁵²⁵ A recent Scandinavian experiment with staggering trading hours for nightclubs, by allowing all-night trading, did result in a more even flow of problem incidents for emergency services to deal with but, unfortunately, at a much higher level than when clubs were required to close earlier.⁹⁷⁴ It is possible that staggered closing hours might be beneficial if they do not result in an overall extension of trading time, which in practice may be hard to achieve.

14.5.4 Licensee codes of conduct to reduce violence

Summary: Evidence for implementation ★ ^{2/3}

There is a substantial body of risk and protective factors associated with the risk of violence in and around licensed premises. Many risk factors that are statistically associated with increased or reduced risk of harm are modifiable. Therefore, the argument has been proposed that changing these risk factors may modify the chance of harm.

One mechanism for modifying drinking environments with a view to reducing alcohol-related harm is through licensee codes of conduct, negotiated with police and other interested parties such as public health and local government personnel. These are usually referred to as Alcohol Accords. There are many possible components to such agreements such as responsible alcohol service, drink discounting bans, trained security personnel, provisions of food, use of safe glassware and alcohol containers, environmental modifications to reduce conflict and frustration and thereby risk of violence.

The Surfer's Paradise Safety Action project was one of the first examples of a comprehensive intervention involving alcohol service venues. It involved encouraging a code of conduct for bars and clubs in a popular entertainment area (on the Gold Coast) that had developed a reputation for violence. Interventions included regulating serving staff, security staff, advertising, alcohol use and entertainment. Managers were regulated through a risk assessment system, and were 'rehabilitated' into the local business community. Managers from other cities who had demonstrated a commitment to reform were involved. On top of this, a key factor was observed to be the significant interpersonal skills of the project officer involved.⁵²⁴ This project was demonstrably successful, overall, in reducing alcohol-related harms including physical and verbal aggression. Consumption and drunkenness declined, and the physical environment improved substantially. None of these improvements can be attributed to any one factor but as a package the program was successful. However, the benefits were not maintained when the research team driving the project moved on, and conditions deteriorated after two years. There was also some evidence that improvements were, to a degree, a result of displacement of problem patrons to other locations.⁵²⁴ For local level interventions, this may only be an issue for communities that do not have an ongoing active program.

Later work by the same team⁹⁷⁶ replicated the Surfers' Paradise model, across two years, in three north Queensland towns. It was found that there were striking reductions in physical violence in and around licensed drinking environments, which could be causally linked to the intervention. The authors remain committed to the robustness of the model but acknowledge that this was a preliminary evaluation and that a wider range of data are needed before firmer conclusions can be drawn.⁹⁷⁶

There have been two other published evaluations of Australian licensing Accords.^{1101, 1102} The evaluation of the Geelong Accord found positive outcomes on some evaluation criteria and not others, whilst the evaluation of the Fremantle Accord found no evidence of effectiveness against a number of hard outcome criteria. One of the differences between the two projects may have been the extent of credible enforcement of liquor laws that accompanied the Geelong Accord.¹⁰⁹⁶ There are clearly a number of implementation issues such as this but there is no doubt that Accords can be an effective vehicle for introducing some harm reducing practices into licensed drinking venues. It is recommended that such voluntary regulation is

accompanied by effective liquor law enforcement, as discussed earlier.

14.5.5 Plastic or tempered glass

Summary: Evidence for implementation ★

The observation that some of the more severe injuries from bar fights were linked to using drinking glasses as weapons has led to the suggestion that using tempered or plastic glass would reduce harm.⁵²⁴ There is no direct research on success or failure of this intervention; however, many drinking venues have implemented this strategy and it is highly likely to be effective on practical grounds alone. Similar arguments apply to seeking alternatives to glass beer bottles, which have also been used as dangerous weapons.

14.5.6 Food service

Definition: Encouraging eating with drinking has been proposed on the basis that the service of food is a protective factor.⁵²⁴

Summary: Evidence for implementation ★

It is well established that drinking alcohol with a full meal can reduce BAC substantially—by up to 60%.⁴² Provision of food in bars has been a component of some Alcohol Accords. In some Australian jurisdictions, it is a requirement that restaurant licences restrict alcohol sales only to people who are eating. There is Australian data showing that these are low-risk licensed premises, both for violence and subsequent drinking and driving.¹¹⁰³ However, the precise contribution to food service, as opposed to type of clientele and other environmental factors, cannot be determined. There is also the contrary and commonly used practice of serving salty snacks, which increase alcohol consumption by increasing thirst.

14.5.7 Harm reduction in Indigenous communities

Night patrols

Definition: The most common harm reduction strategy in Indigenous communities is the use of night patrols, which provide transport to safe locations for intoxicated persons.

Summary: Warrants further research 📖

There were 69 patrols operating in various locations in 1999/2000.⁸⁵⁹ Most were designed to reduce alcohol-related conflicts and harm. Mosey provided an overview and largely qualitative assessment of the operation and effectiveness of remote area night

patrols in Central Australia.¹¹⁰⁴ Sputore and her colleagues have conducted qualitative and limited quantitative evaluations of patrols in Kununurra, Wyndham and Halls Creek, in WA.^{867, 868} While the quantitative measures were equivocal—because of confounding factors—people in the WA communities generally rated the patrols as effective in reducing alcohol-related violence and getting intoxicated people off the streets.

Sobering-up shelters

Definition: Sobering-up shelters provide a temporary haven for, and supervision of, intoxicated people at risk of causing harm to themselves or others, and divert intoxicated people from police custody.

Summary: Warrants further research

In 1999/2000 there were 23 shelters.⁸⁵⁹ Daly and Gvozdenovich conducted a qualitative evaluation of shelters in three WA towns and found that the shelters were well-accepted by both clients and police.¹¹⁰⁵ Evaluation of a shelter in Kununurra, Western Australia, found that it was well accepted and led to a significant reduction in police detentions of intoxicated people.⁸⁶⁷

14.6 Reducing opiate overdose

Interventions to reduce mortality and morbidity associated with heroin-related overdose are of two types: strategies to prevent the occurrence of heroin overdoses, and strategies to improve the management of overdoses when they occur. The former include educating users about risk factors for overdose (e.g. poly-drug use, using opiates when alone, reduced tolerance with abstinence, etc.) and how to minimise the risk factors, and expanding treatment options, especially methadone. The latter include improving user response to overdose by encouragement to call an ambulance, and training in resuscitation; establishing protocols between police, ambulance services and user representatives (e.g. that police will not routinely attend ambulance calls to overdose); setting up peer outreach, such as that targeted through hospital emergency departments; and making naloxone hydrochloride (Narcan) available to users, peers, family members and outreach workers. Since, in Australia and elsewhere, many of these interventions are still being expanded, it is too early to see any impact on the number of deaths.

14.6.1 Educational interventions

Summary: Evidence for implementation ★

There are many behavioural risk factors for opiate overdose. These include injecting when alone, injecting while under the influence of alcohol and/or benzodiazepines, and injecting after a period of abstinence or otherwise reduced tolerance.^{230, 1106} Accordingly, consideration has been given to educating heroin users about overdose risk behaviours. While such programs have been conducted in many locations, actual evaluations of their impact are scarce. A South Australian study involved a comprehensive education campaign, and liaison with police and ambulance.¹¹⁰⁶ Research demonstrated that the target audiences were well aware of the key messages of the intervention and there was tentative evidence that this was associated with an increased rate of ambulance attendance at overdose, resulting in lower death rates.

14.6.2 Protocols for emergency services attendance at overdose

Definition: Concerns have been expressed that police attendance at heroin overdoses will reduce the likelihood that users will call an ambulance.¹¹⁰⁷

Summary: Evidence for implementation ★ ^{1/1}

An inherent part of the South Australian intervention, referred to above, was developing ambulance and police protocols for overdose attendance, ensuring that police did not attend overdoses unless required, and then distributing information about this to heroin users. The National Heroin Overdose Strategy includes two key recommendations.¹¹⁰⁸

- Develop protocols between police and ambulance services that clarify the circumstances under which ambulance services may call on police to attend drug overdoses.
- Develop police protocols for attendance at overdose (whether called by ambulance or other means), including use of discretion.

The National Strategy, therefore, reflects the principles that police policy should not act to reduce the likelihood that users will call an ambulance, and that police need the flexibility to exercise discretion in order to avoid harm.

14.6.3 Better availability of treatment for opioid dependence

Summary: Evidence for effective dissemination ★★★

The evidence shows that treatment, particularly methadone maintenance treatment, substantially reduces the risk of heroin overdose.²³⁴ Heroin users not in treatment have a risk of mortality 13 times that of non-using aged peers, compared to 3.4 times for those who are in methadone maintenance treatment.⁴⁰⁸ Hall recommended that expansion of the treatment options available should be a major strategy for reducing opioid overdose mortality. This should include alternative pharmacotherapies, such as LAAM and buprenorphine, which may be more attractive to older, long-term users.¹¹⁰⁹

14.6.4 Provision of naloxone for peer administration

Definition: Naloxone administration instantly reverses both intoxication and overdose.

Summary: Warrants further research 📖

Treatment of heroin overdose by the use of heroin antagonists, such as naloxone (Narcan), is almost universally indicated in medical settings.²³⁰ Naloxone administration is safe and reliable. One initiative that has been proposed to reduce the rate of opiate overdose is the distribution of naloxone to users.^{230, 1110, 1111} To date, no Australian trial has been conducted of such an intervention.

There is an international literature on naloxone provision to users which appears to support this use as a preventive measure. Naloxone has been available over-the-counter to users in Italy since 1995 and is also available in a variety of other locations. However, no comprehensive evaluations have been performed on its effectiveness for this use.

Possible benefits of naloxone administration are given.

- Naloxone administration is a simple, easy-to-use method for immediately and effectively treating heroin overdose.
- Naloxone has no effect in the absence of heroin, and cannot be used as a recreational drug.
- Overdoses rarely occur alone, meaning that there is potential for others to provide aid.
- There is a minimal risk of adverse reactions to naloxone

Possible complications include the following.

- Naloxone administration often requires first aid to maintain breathing until the naloxone takes effect. Therefore, it is recommended that training in first aid take place in conjunction with naloxone distribution to users.
- There are legal complications surrounding making naloxone more available.

There are some criticisms and concerns about the proposition, as follows.

- It has been suggested that more hazardous opiate use may occur as a result of the security of naloxone being available for peer administration. Given that naloxone administration is quite unpleasant, this seems unlikely.
- Naloxone will be little use to those injecting alone (40% of fatal overdoses).
- Naloxone follow-up care may be lacking, in contrast to situations where medical professionals have been involved.

There have been no Australian trials and a well-controlled, well-designed and cautious trial to assess the use of such a strategy in preventing overdose deaths is warranted.^{1110, 1111}

14.7 Reducing harms associated with injecting

The major harms associated with injecting are the transmission of blood-borne viruses (BBVs), overdose, and the reduction of public amenity relating to visible injecting and discarded used injecting equipment. Accordingly, programs have been developed to address these concerns.

14.7.1 Needle and syringe distribution programs

Definition: Needle and syringe programs (NSP) have been the cornerstone of Australia's response to BBVs in injecting drug users.¹¹¹² NSPs include not only dedicated needle exchange programs, but also pharmacy sales of injecting equipment.

Summary: Evidence for effective dissemination ★★★

The key aspect of successful BBV harm reduction for injectors is that they should have easy access to clean injecting equipment—predominantly needles and syringes but also swabs, spoons and sterile water. Sharing non-needle elements of injecting equipment is believed to be implicated in the transmission of hepatitis C.¹¹¹³

The initial impetus for the development of NSPs was the HIV/AIDS epidemic. While there has been considerable concern in the US about the effect of NSPs, the US Centres for Disease Control have failed to find any evidence that needle exchange programs affect either frequency of injection among users or rates of recruitment to injecting drug use, while concluding that the programs significantly reduce needle sharing.^{1114, 1115} A wide body of other international research, including Cochrane reviews, confirms the finding that NSPs are effective in preventing HIV infection and do not cause any increase in drug use.^{783, 804, 1116, 1117}

The early and rapid establishment of needle distribution programs in Australia is one of the foremost reasons why the rate of HIV infection among Australian injectors has remained at less than 3%. This is borne out in a report of the economic effectiveness of NSPs in Australia. The Return on Investments study investigated the effectiveness and cost-effectiveness of needle and syringe programs (NSPs) in Australia, from 1991 to 2000, and found that NSPs were effective in reducing rates of HIV infection and hepatitis C. It was estimated that in Australia, by the year 2010, 4500 HIV-related deaths and 90 HCV-related deaths, will have been prevented, as well as 25 000 HIV infections and 21 000 hepatitis C infections. In treatment costs, this would amount to savings of \$2.4 to \$7.7 billion for an investment of almost \$150 million. In addition, benefits for consumers in number of life years gained and improved quality of life are demonstrated.¹¹¹⁸

The prevention of hepatitis C among injectors is a greater challenge than the prevention of HIV/AIDS because this epidemic was well established before the introduction of NSPs. It has been recommended that NSPs be expanded in sufficient quantity to meet distribution targets of injectors always using sterile injecting equipment. The demand for needles and syringes has been rising exponentially, but funding has not always been available to meet this continually increasing demand.¹¹¹²

A common community concern about NSP programs is that they increase the number of needles and syringes discarded in public places. However, ANCD research reviews have concluded that, in general, NSP programs do not increase the numbers of inappropriately discarded syringes.⁸⁰⁴

Other elements of Australia's harm reduction approach to BBVs in injectors are outreach and

education, and the provision of methadone maintenance treatment (MMT). NSPs often offer a variety of ancillary services, including treatment linkage, education, information, screening and testing services, and advocacy services.¹¹¹⁶ In general, outreach programs have been shown to promote treatment entry and encourage some degree of change in levels of risk behaviour.⁸⁰⁴ Rates of needle sharing have decreased steadily over this decade, and it is plausible that these programs have contributed to this behavioural change.¹¹¹² Some US studies have indicated that outreach-based education programs were effective in reducing risk behaviours in injectors, including needle sharing and unsafe sex.¹¹¹⁹

Needle and syringe exchanges in Indigenous communities

The provision of free or cheap needles and injecting equipment is a key strategy in attempts to reduce the spread of BBVs among people who inject drugs. In 1999/2000, there were six needle exchanges specifically for Indigenous people and an unknown number of Indigenous health services also provided clean needles and other injecting equipment.⁸⁵⁹

14.7.2 Methadone maintenance therapy (MMT)

It is clear that MMT assists in the reduction of HIV-risk behaviour and can reduce the incidence of HIV infection. Participation in MMT is related to less frequent injecting, less frequent sharing, fewer sharing partners and lower HIV seroprevalence.¹¹²⁰ In a review of literature addressing the impacts of MMT on BBVs, Ward, Mattick and Hall concluded that there was considerable evidence that methadone protects against HIV infection, because it reduces risk behaviours such as injecting and needle sharing.¹¹²¹ The same level of confidence cannot be applied to reductions in the risk of hepatitis C—partly because many injectors will have contracted hepatitis C before entering treatment. To state the obvious, if MMT reduces the prevalence of injecting, the occasions in which there is a risk of HCV transmission are reduced. Since hepatitis C prevalence is closely linked to duration of injecting, methadone and other treatments would be more effective against hepatitis C if they were undertaken earlier in the injector's career.

14.7.3 Supervised injecting centres

Definition: Legally sanctioned environments where drug users can inject under some degree of supervision.

Summary: Evidence for implementation ★

Other approaches to the reduction of harms associated with injecting include the introduction of supervised injecting centres. The evidence base related to the potential prevention benefits of Australian supervised injecting centres is sparse as these centres are a relatively recent Australian development. There are a number of reviews of international experiences; and six month and 12 month progress reports of evaluations of Australia's only medically supervised injecting centre (MSIC), in Kings Cross.

Supervised injecting centres have been used in a variety of major city locations across the world in an attempt to reduce some of the harms associated with injecting drug use.^{1124–1126} While there are numerous variants, the basic notion is that a legally sanctioned environment is provided where drug users can inject under some degree of supervision. Clean needles and syringes are usually available, surroundings are typically far more hygienic than normal injecting environments, and staff are available to provide immediate resuscitation after an overdose.

There are four main purported benefits of supervised injecting centres.¹¹²⁴

1. Reduction in harms to the general public (reductions in: discarded syringes, visibility of street injection scenes, frequency of public injection and public intoxication).
2. Reduction in risk of overdose, both fatal and non-fatal.
3. Reduction in risk of BBV transmission.
4. Improved access to treatment and other social welfare services.

There are three main criticisms of the general concept of injecting rooms.¹¹²⁴

1. Being seen to condone drug use, and thereby 'sending the wrong message'.
2. Causing a congregation of drug dealers around the site—the 'honey pot' effect.
3. Concern that use of the centre will result in delays in entry to treatment.

The international (largely European) evidence suggests that:

- the presence of injection rooms appears to reduce (but not eliminate) the visibility of injecting drug use,¹¹²⁴
- users see the rooms as a positive experience and welfare and treatment access by users also appears to improve, with consequent improvements in general health and functioning,^{1124–1126}
- overdose rates and risks of fatality appear to be improved in supervised injection centres. To date, there has not been a single recorded death at any injection centre worldwide.^{1124–1126} Given the sheer numbers of centres in operation (over 45 in Europe alone), this is a significant feat. It also seems that the rate of non-fatal overdoses is lower than would normally be expected,
- whilst it is not possible to measure the impact of supervised injecting centres on rates of BBV transmission, it appears that centres are associated with substantially fewer risky injection practices.^{1124–1126}

Despite these positive findings, the review literature is clear that there have been few thorough impact evaluations on the European sites, and the majority of the published literature does not appear in English.¹¹²⁴ Evidence of outcome effectiveness is, therefore, not yet available.

The MSIC in Sydney's Kings Cross was established on the recommendation of the NSW Wood Royal Commission, and an 18 month trial is underway. Currently, only the 6¹¹²² and 12¹¹²³ month evaluation reports are available. The following is a summary of the key findings from both documents.

- Over the first 12 months, 2279 individuals were assessed and registered to use the centre, making a total of 31 675 visits.
- Most clients were male but female clients had a higher average number of visits per client.
- For the first six months, cocaine was the most commonly injected drug (47%), followed by heroin (45%). At 12 months, heroin was the most common at 50% of visits, with cocaine at 42% of visits.
- Clients made an average of 12 visits per 12 months, although the range was wide at one to 535 visits.
- After 12 months, one in 31 visits generated a referral to other health care services for further

assistance. This is a total of 1007 referrals. Forty-four percent of these referrals were for drug dependence treatment, 31% were for primary health care services, and 25% were for welfare services.

- One-third of client visits led to medical services other than supervision of injection, being provided to clients.
- Only a small percentage of visits (0.8%) resulted in drug-related clinical incidents. These included 184 heroin overdoses (resulting in zero fatalities), 50 cases of cocaine-related toxicity, eight benzodiazepine overdoses, and eight non-heroin opioid overdoses.
- The six month report noted that all overdoses were managed successfully, with no adverse consequences.
- A total of 5958 sterile syringes were dispensed for take-away use by clients at the six-month point, in addition to the sterile equipment provided for each instance of injection.

The report that 184 heroin overdoses had occurred with no fatalities attests to the efficacy of the approach. Previous research has estimated that under normal Australian heroin usage conditions, one in 20 heroin overdoses is fatal.²³⁰ This would roughly translate to nine lives saved as a result of the supervised injecting centre.

In relation to the three concerns described above, the centre does not appear to have had any significant adverse impact on public order or public amenity in the area. Evaluation of loitering and other criminal activity has been conducted by the NSW Bureau of Crime Statistics and Research. They reported that there has been no observable impact on crime rates, loitering rates, pedestrian traffic levels, and there was no indication that the MSIC had any effect on either theft or violent acquisitive offences in Kings Cross Local Area Command based on the COPS database from 1 May 2000 to 30 December 2001.¹¹²⁷ It seems likely that MSIC has enhanced access to treatment and welfare services by at least some its clients.

The final (18 month) report of the evaluation of the MSIC had not been completed at the time of writing, so that final judgements on its efficacy cannot be made.

14.7.4 Vaccination against hepatitis B

Summary: Evidence for effective dissemination ★★★

In Australia, the NHMRC recommendation of universal vaccination to prevent hepatitis B has been adopted but the uptake of vaccination by high-risk populations, such as injectors, is far from complete for a number of reasons. These include limited knowledge about vaccine among injectors, and cost to the recipient. Better means of making vaccine available to all injectors, including programs of free vaccine, are needed.¹¹²⁸

14.7.5 Retractable syringes

Definition: Retractable syringes are intended to be used only once, after which the needle retracts into the barrel of the syringe, preventing it from being used for further injections, or, from causing needlestick injury.

Summary: Evidence is contra-indicative ☒

The Australian Government has recently announced its intention to develop and introduce retractable syringe technology, and has allocated 27.5 million dollars in funding. The media release for the project lists two main reasons for this proposal: public concern over needlestick injury from discarded syringes in public places, and the risk of disease transmission through needlestick injuries in health care settings.¹¹²⁹

No syringe design can ever totally prevent sharing by injecting drug users. It is always possible to fully load the syringe, and then administer partial doses to two or more people.¹¹³⁰ This may actually increase BBV risk, since conventional syringes can at least be cleaned in between injections but retractable syringes cannot. A US research team has concluded that conventional needles will always be superior to retractable needles in regard to reducing the risk of BBV infection.¹¹³¹ Retractable syringes are also likely to be very expensive. There is a currently significant lack of data in regard to feasibility of using retractable needles in Australia.

14.8 'Dance drugs' (phenethylamines, LSD, ketamine)

Harm reduction programs relating to the use of so-called 'dance drugs' have been of three main sorts: information campaigns aimed at users and in the form of guidelines for club owners and dance event promoters to help minimise environmental risks; employing trained outreach workers to provide

support and links to appropriate emergency interventions for those experiencing problems at dance events; and sites at events where users can have their pills ‘tested’ or checked against a register of previously tested pills and capsules.¹¹³²

14.8.1 Information campaigns

Summary: Warrants further research 

Information campaigns have focused on providing advice about proper hydration, managing body temperature, and avoiding risky behaviours, such as unsafe sex or driving whilst intoxicated by dance drugs. In Australia, these have included the RaveSafe project, which has since become a generic name for programs in this country aiming to promote safety in the dance club or ‘rave’ environment.²²⁶

14.8.2 Guidelines for dance events

Summary: Warrants further research 

In Australia, as internationally, various groups and organisations have attempted to establish conduct guidelines for dance parties or similar nightclub venues.¹¹³³ These guidelines involve aspects such as adequate availability of cold drinking water, having chill-out rooms, and hiring professional security staff. There is no direct evidence to say if they reduce harm, or not. However, they are certainly evidence-based in that acute drug-related harm in this environment is often a function of overheating, and therefore ready availability of water and chill-out environments appears a sensible strategy.

14.8.3 On-site testing of pills

Definition: Programs that aim to identify the contents of ecstasy tablets and to provide this information to users.

Summary: Warrants further research 

As discussed earlier, some of the harms associated with ecstasy use are caused by the fact that pills often contain a wide variety of psychoactive substances other than MDMA. Some of these substances are inherently more harmful, such as PMA. Others, such as GHB and ketamine, require a different approach to manage and reduce risk.²²⁶ In addition, there is a distinct lack of quality Australian scientific data on the actual content of street-level ecstasy pills.¹¹³⁴ Various countries and organisations have advocated or implemented various on-site pill testing programs in an attempt to reduce the risk associated with ecstasy use, and to inform the knowledge base on managing ecstasy-related risks.

On-site pill testing programs are used widely throughout the European Union (EU).¹¹³⁵ Typically, these programs involve the provision of short informational sessions on safer use strategies while pill testing takes place.¹¹³⁵

An argument often advanced against the provision of timely pill testing data to users is that it gives an impression of safety to the consumption of MDMA, which it is held may lead to increased consumption.¹¹³⁴ There is no evidence to either support or refute this statement.¹¹³⁵

The level of evaluation that has taken place in the various EU pill testing programs is generally very poor, and little conclusive information is known about the effects of these programs.¹¹³⁵ There is a need for more research and evaluation studies on the entire range of effects of on-site pill testing interventions.

The Australian Bureau of Criminal Intelligence conducts some degree of off-site pill testing in Australia, based on seized tablets,^{165, 168} but the data are not made available to the research community. Adequate and timely access to these data would provide further insight into the nature of ecstasy markets in Australia and would allow far more informed research and assessment on the impact of any future changes in legislation or supply control approaches regarding ecstasy.

There has been some media and community debate in Australia about the availability of home-testing kits for ecstasy pills. Typically, concerns have been raised about the availability of such kits, either being perceived as condoning use or as possibly increasing use. There is no evidence available allowing comment on the impact of availability of testing kits on consumption levels.

14.9 Benzodiazepines

Harm reduction programs relating to the use of benzodiazepines have focused on the injecting of temazepam gel capsules and the use of flunitrazepam (e.g. Rohypnol) in drug-assisted sexual assault. Temazepam gel capsules have recently been moved to Schedule 8 of the National Drugs and Poisons Schedule, in order to reduce their use by injectors.²⁴⁷ Flunitrazepam has also been moved to Schedule 8 and there is evidence from the IDRS that its availability and usage by injectors has decreased markedly since its rescheduling, in 1998.¹¹³⁶

14.9.1 Dyes in benzodiazepines

Summary: Limited investigation O

In response to concerns about drinks being spiked with drugs in nightclubs and bars, Roche introduced a blue dye to Rohypnol, which was intended to make it more difficult to administer to someone's drink without them noticing. However, Rohypnol has since been withdrawn from the market, although it is believed that flunitrazepam is still available under the brand name Hypnodorm (Malcolm Dobbins, Dept of Human Services, Victoria, personal communication). It is not possible to comment on the effectiveness of adding a dye to the product, particularly in a poorly lit venue such as a nightclub. However, it is hard to imagine any disadvantage of adding such a dye other than, perhaps, the extra cost to the manufacturer.

14.10 Petrol

Until the phasing out of leaded petrol, harm reduction strategies also included the substitution of unleaded for leaded petrol. When this was introduced in Maningrida, it led to a significant reduction in the number of hospital admissions due to petrol sniffing.¹¹³⁷

14.11 Harm minimisation drug education

Summary: Limited investigation O

Australia and Europe, in contrast to the US, have more of a focus on harm minimisation strategies for drug education. The systematic review by White and Pitts did not include any evaluations of harm minimisation approaches (13 considered) because studies did not meet criteria for methodological rigour.⁶⁵⁴ The authors attribute this to approaches usually targeting hard-to-reach groups and, therefore, having problems with program implementation and evaluation. However, a major recent Western Australian controlled study supports the view that school-based drug education based on a harm minimisation framework can be effective for reducing youth alcohol use, and related risk and harm associated with alcohol.¹⁵⁵ In addition, Baer and others have demonstrated effectiveness of harm reduction approaches with US college age youth,⁷⁵³

and Newman and colleagues have shown that a harm reduction approach to drink-driving education in year 9 was successful in increasing knowledge and reducing the rate of riding with a drinking driver.¹¹³⁸ It did not, however, change alcohol consumption. Many of the prevention programs from the US are based on an aim of abstinence and therefore evaluate effectiveness in terms of statistically significant delay in onset of use. Further research is required, with long-term follow-up, to establish whether programs can achieve a clinically significant (as well as statistically significant) reduction in the harms associated with drug use.

14.12 Conclusions

Harm reduction is often thought of only as needle and syringe programs, but many more strategies are used and, in many cases, have been shown to be effective. Programs with the strongest evidential support are as follows:

- regulations to reduce passive smoking,
- random breath testing,
- needle and syringe distribution,
- treatment of opiate dependence to reduce risk of overdose and blood-borne viruses,
- hepatitis B vaccination.

By contrast, evidence does not support 'light' cigarettes, staggered closing times and retractable syringes, and these programs are contra-indicated.

PART 6

SYNTHESIS AND IMPLICATIONS

CHAPTER 15: INCREASING PROTECTION AND REDUCING RISK ACROSS THE LIFE COURSE

15.1 Summary

This chapter presents an overview of policy and future investment implications for the prevention of early developmental problems, early age drug use, risky use and harm. A Protection and Risk Reduction Approach to Prevention is presented, acknowledging that broad social determinants influence drug use. The approach incorporates the developmental risk and protective factors conceptualisation of youth problem behaviours, and the brief intervention and harm reduction frameworks used with adults. An approach to prevention is outlined, emphasising the local community as an important setting for ensuring the coordinated development and delivery of the Protection and Risk Reduction Approach to Prevention across different policy jurisdictions, and spanning appropriate periods of time. The emphasis on the local community flows from the requirement to tailor prevention strategies to varying local conditions, the emerging success of community approaches and the attraction of enhancing community in order to address growing social disconnection.

An examination of patterns of drug use and harms reveals the importance of continuing efforts to reduce tobacco use. The need to increase investment relevant to alcohol is also identified, with escalating levels of youth alcohol use of particular concern. It is noted that illicit drug use is responsible for disproportionate harms in some populations.

Continued and enhanced investment is recommended in the following four broad areas, with maximum benefit obtained from the simultaneous delivery of complementary strategies.

Universal interventions to prevent tobacco use and risky alcohol use: legal drugs generate the great bulk of health, economic and social drug problems in contemporary Australia. The bulk of problems are found within mainstream society among persons with average levels of developmental risk. Early use of legal drugs predicts later problematic alcohol and other drug use, as well as mental health problems. Parental and community role models encourage use among children and adolescents, suggesting the requirement for ‘whole population strategies’ to address overall levels of use and to break inter-generational patterns.

Universal interventions to reduce the supply of, and demand for, licit and illicit drugs: law enforcement strategies are necessary to protect the community against the crime and social disorders that flow from the use of prohibited drugs. Law enforcement plays a critical role in prevention by: reinforcing community values against illicit drug use, controlling the supply of licit drugs, and diverting early offenders to preventive interventions.

Targeted interventions to address vulnerable and disadvantaged groups, with particular attention to Indigenous Australians: interventions should provide evidence-based support to families at the key developmental stages of infancy, pre-primary and primary school. The interventions have the potential to address the bulk of harms associated with the use of illicit drugs as well as a significant proportion of problems with legal drugs.

Treatment, brief intervention and harm reduction approaches for adolescents and adults with emerging, or developed, risky drug use patterns: investment in proven treatment methods, whether abstinence-oriented or harm-reducing, reduce drug-related harm at the population level. Brief screening interventions have an untapped potential for widespread application in primary health care and community settings. Family members, particularly children, need to be involved in treatment programs to help break inter-generational patterns of substance use and related harm.

15.2 Introduction

In this final chapter, we describe what we have been able to glean from our readings on drug-related harm. The overarching aim of this document is to provide the evidence basis for a comprehensive national agenda for the prevention of problems relating to drug use.

The evidence we have reviewed relates to:

- the nature and extent of the major drug-related harms,
- the underlying patterns of drug use,
- the social and developmental antecedents of these patterns, as well as for other problem behaviours, and
- the evidence base for interventions to reduce risk and increase protection, throughout the life course.

In what follows, we summarise and synthesise what is known in each of the above areas in order to frame conclusions and consider future directions. A number of unifying principles and concepts relevant to the Protection and Risk Reduction Approach to Prevention were outlined in the introduction of Chapter 1. The first implication flowing from our review is that there are opportunities for a more coordinated national prevention agenda, through the adoption of an integrative policy framework. This approach integrates knowledge of developmental processes throughout the life course, with knowledge of broader macro-social and environmental influences on behaviour and health outcomes. The Protection and Risk Reduction Approach emphasises the importance of reducing the known developmental risk factors that lead children and young people to become involved with risky drug use and harm, while also enhancing protective factors. The framework acknowledges that targeted, early intervention strategies focused on strengthening protective factors will be useful for children and youth with a high number of developmental risk factors. The approach should also emphasise brief interventions and treatment and harm reduction strategies, acknowledging that such strategies can reduce drug-related harm for drug users that have a high number of risk factors, while also improving developmental opportunities for children. Effective regulation and law enforcement should be considered as essential elements of this approach to prevention, not just in controlling the supply of drugs, but also in influencing community values about drug use, diverting early offenders and acting to protect the community from crime and social disorder.

The favoured approaches to prevention are based on an examination of both early risk factors (e.g. social and early developmental risks) and late risks relating to patterns and circumstances of drug use. With regard to late risk factors, we have identified some basic concepts regarding the pharmacological and psychological effects of different drugs, their dose-response effects, toxicity, associated behavioural changes and drug dependence. All of the harms related to drug use can be attributed to: the interplay between these psychobiological processes, individual behaviour, drug use settings and broad social influences. A national prevention agenda needs to seek opportunities across many sectors to reduce both distal and proximal risks for drug-related harm.

The second implication of our overview leads us to emphasise a systems approach to drug prevention which acknowledges the:

- many levels of society in which there are influences on patterns of drug use and harm,
- many levels in which interventions may be delivered, and
- importance of consistency across diverse levels and sub-systems in terms of influences and interventions.

There are many opportunities for synergies across diverse areas of action. For example, investment in treatment and brief interventions is likely to diminish crime, road trauma, disease and other serious harms associated with drug use. Law enforcement practices can affect entry to treatment facilities. Judicial processes have the capacity to divert illicit drug users, at an early stage in their drug using career, into effective intervention programs. There are also issues around attempting to reconcile inconsistent influences on patterns of drug use, such as the powerful role modelling of smoking, drinking and sometimes drug use provided by the media, as opposed to the less frequent mass media campaigns to deter risky drug use. It is important to review the many opportunities for reducing risk and increasing protection for individuals, families and communities across all levels and sub-systems of modern society.

To better organise the systems approach to prevention, we have emphasised the local community as one of the primary levels for integrating and coordinating planning within a Protection and Risk Reduction Approach to Prevention. An emphasis on the local community offers prospects for addressing some of the broad

social determinants related to both social disadvantage and disconnection that underlie aspects of drug-related harm. A structured approach to local community organisation also offers a promising method for the coordinated application of evidence-based prevention strategies aimed at the reduction of developmental risk factors and enhancement of protective factors. By emphasising the community level, the implications of the systems model for a coordinated approach to prevention across different jurisdictions become clearer. Policy and research opportunities flowing from the evidence reviewed were summarised for each of several sub-systems and jurisdictions within which interventions can be implemented. It is critical that national and state policies, legislative models and regulations are based on evidence about drug-related risk and harm, and enable and empower local communities to develop effective prevention strategies.

Prior to considering the range of opportunities for intervention and prevention, it is important to have a clear picture of: a) the overall patterns of drug-related harm as they currently impact on Australians; and b) the overall patterns of risky drug use that underlie these harms.

15.3 Patterns of drug-related harm in Australia (Chapter 3)

It is easier to quantify the health, safety and economic costs of drug use than the social and legal costs. An overview was presented of key indices of health and economic costs, by drug type and broad age groups, using most recent available data.

The key points revealed by this overview are as follows.

- Tobacco is the leading cause of premature death and hospitalisation among Australians. Most (77.8%) of tobacco-caused deaths involve persons over 64 years of age. However, tobacco-caused deaths involving children and adults up to 64 years of age are still greater in total than all deaths caused by alcohol and illicit drugs combined for all age groups. The economic costs of tobacco reflect this fact.
- Alcohol causes the deaths and hospitalisation of slightly more children and young people than do all the illicit drugs combined and many more than does tobacco. These deaths are almost all caused by either intentional or unintentional injuries. While alcohol is also responsible for the deaths of many more adults and elderly people than are the illicit drugs, there are a much larger number of deaths believed to be

saved among older people as a result of, mainly, low-risk alcohol consumption, principally among older women.

- The estimates of economic costs are updated for 1998 and demonstrate an important contribution to the costs of illicit drug use from law enforcement and crime.

It is important to note that there are also likely future health costs associated with current drug use that are hard to estimate. However, it is inevitable that given the wide prevalence of hepatitis C among injecting drug users in Australia, there will be substantial mortality, morbidity and associated economic costs as a result of higher incidence of liver disease in this group, in future years. In addition, there are known to be social harms impacting on individual users of illicit drugs who receive criminal convictions.

15.4 Patterns of risky drug use in Australia (Chapter 4)

The patterns of risky drug use underlying the above harms can be classified into those caused by adverse influences on: the development of children and youth (e.g. through role-modelling, exposure to passive smoking, impairment to parenting), early age use (resulting in developmental problems), regular use (e.g. liver disease and cancers), intoxication (e.g. injuries, overdoses and poisonings), unsafe means of administration (e.g. BBVs from dirty needles, septicaemia), and dependence (e.g. withdrawal symptoms, treatment costs). Some types of harm straddle these categories, such as suicide and some strokes associated both with intoxication and regular use of alcohol, in particular. Social harms, such as loss of employment and impairment of personal relationships, can also be a function of the combined effects of a long-term pattern of heavy use, frequent episodes of intoxication, and time and resources expended acquiring drugs.

The main features of risky drug use patterns in Australia are as follows.

- There has been a dramatic reduction in levels of smoking in Australia in recent decades, such that rates of daily adult smoking fell below 20% for the first time in the 2001 NDSHS.²² Smoking rates by young people, and young women in particular, have been less resistant to change in recent years and are a concern for future levels of tobacco-caused mortality and morbidity.

- Alcohol consumption in Australia has recently increased slightly overall, and more markedly among young people. Two-thirds of Person Years of Life Lost through risky alcohol use are due, at least in part, to the short-term or acute effects from alcohol intoxication. A very conservative estimate from the 1998 NDSHS is that 67% of all alcohol consumed in Australia is done so in a manner inconsistent with the latest NHMRC National Alcohol Guidelines.⁴² For young adults that figure is 90%.
- Cannabis is the most widely used illicit drug in Australia, though its use may have declined very recently. In most jurisdictions, any use at all of cannabis poses the risk of receiving a criminal record. Around 10% of people become regular heavy users of cannabis and risk long-term health consequences and dependence. Combining cannabis with depressant drugs, such as alcohol, appears to interact to pose extra short-term safety risks (e.g. before driving). Cannabis use during adolescence is associated with later mental health and conduct problems, though the causal processes remain unclear.
- Injection is the main risk behaviour in relation to health-related harms from other illicit drugs. The 2001 NDSHS indicates that less than 2% of the adult population report injecting illicit drugs at some time in the last 12 months.²² Injection of opiates delivers a usually unknown quantity of the drug rapidly and poses a risk of overdose, especially if other CNS depressant drugs (alcohol and benzodiazepines) have also been consumed. Sharing of injecting equipment and associated paraphernalia is a major risk factor for the spread of BBVs.
- Heavy 'binges' on amphetamine-type drugs are associated with reckless and aggressive behaviour and, when sustained over days, may precipitate a psychosis. The risks of use of other illicit drugs, such as phenethylamines, are poorly understood.
- Finally, there are marked temporal and developmental sequences concerning the ages of first use and the order of onset of use of drugs. It is apparent that early use of tobacco and alcohol is predictive of later problems with tobacco dependence, alcohol and illicit drugs. It is also clear from longitudinal research that use of alcohol and tobacco at an early age predicts progression to heavier drug use, even after adjusting for the influence of a range of known developmental risk factors. The mechanisms by which legal drugs serve as 'gateways' in some

sense for illegal drugs are not clear. Adolescent use of cannabis significantly increases the risk of later use of other illicit drugs, but nonetheless, only around 10% of cannabis users progress to use other illicit drugs.

15.5 Social determinants of drug use and related problems (Chapter 5)

Patterns of drug use and related harms are not distributed randomly across the population; there are defined groups in contemporary Australia that are over-represented in the statistics. Given the substantial contribution of tobacco, alcohol and illicit drug use to the total 'burden of disease' in Australia, and worldwide, it is not surprising that these groups are usually also those that are over-represented in statistics on general ill-health. Firstly, across all drug types, being male and being young are each independently highly predictive of involvement in risky drug use and harm. Secondly, almost any measure of disadvantage will be similarly associated with increased risk and harm from drugs, regardless of gender and age. In relation to legal drugs, however, there is evidence of a U-shaped relationship such that, for example, both low and high income can be predictive of greater consumption and related harm. It is likely, however, that there are different underlying patterns, such as less frequent but higher intake drinking associated with higher rates of acute alcohol-related harm among disadvantaged groups. This latter pattern of drinking and related harm is most clearly expressed among Indigenous Australian populations who also have very high rates of smoking and a host of other health risk behaviours. The association of drug use and measures of social disadvantage is strongest for the illicit drugs versus the licit, and also for more intensely problematic patterns of drug use, including dependence. Addressing social disadvantage in all its forms has come to be seen as a central issue for modern drug policy to address.

Related to findings of social disadvantage, there are indications that social disconnection is increasingly a modern driver underlying drug-related harm. Family breakdown, loss of community, increasing mobility and weakened religious institutions are structural determinants undermining social stability that have been identified as developmental risk factors for drug-related harm. The emerging calls within mental health promotion for a focus on social and community wellbeing are pertinent to efforts to address these more pervasive and insidious determinants of drug-related harm.

15.6 Risk and protective factors (Chapter 6)

The social determinants perspective on health and health risk behaviours is one traditional approach informing an important emerging perspective on the genesis of youth drug use. Comprehensive reviews of longitudinal and other studies examining significant influences on the drug use of young people have identified factors and variables such as family functioning, school performance, peer influences, temperament and local drug availability as predictive of who will use drugs. This literature was discussed in depth in Chapter 6. The variables highlighted above were combined to form overall survey measures of risk for, and protection against, a variety of problem behaviours, including drug use. Children with high scores on the risk scale and low scores on the protection scale are more likely to drink in a risky fashion, smoke, use illicit drugs, experience mental health problems and exhibit conduct disorders. It is noteworthy that some elements of risk include adult modelling of drug use and the extent of community availability of licit and illicit drugs.

Evidence suggests that both early initiation and frequency of youth drug use are most clearly predicted by the cumulative number of elevated risk factors, rather than by any specific risk factor. For youth on trajectories characterised by a high number of risk factors, there is evidence that elevating the number of protective factors can reduce the likelihood of a range of adverse outcomes. This knowledge emphasises the importance of prevention activities and strategies focused on reducing risk factors and enhancing protective factors within specific communities. When the examination of protective factors is extended beyond adolescence into adulthood, it becomes apparent that many harm reduction strategies are in concert with this community emphasis on enhancing protective factors for those with a high number of risk factors.

15.7 Where should we target prevention investment? Risk, protection and the prevention paradox (Chapter 6)

The economic consideration of prevention investment leads to a search for methodology to assess the optimal way to combine approaches to prevention. To date, little economic evidence has been forthcoming to ensure that an 'efficient' use of society's resources is being made across the drug

policy arena. Much evidence still rests on the individual impact and effectiveness of programs, without specifying the resources needed to bring this about. Most evaluations still do not focus on the personal and social resources required and this partial approach leads to a potential waste of scarce resources. Within each section of this report, we have presented data relevant to cost-benefits, where this was available.

The report has focused particularly on costing the economic benefits accruing through the impact of programs and strategies in reducing harmful drug use. It is important to reiterate that such costings are likely to be conservative, particularly in the area of developmental prevention. This is because there are additional social benefits beyond reduction of harmful drug use that can be expected to flow from programs that more generally improve the developmental opportunities of children and their community social environments. For example, the reduction of a risk factor such as academic failure is likely to lead to greater completion of high school, increased attendance at college and greater job opportunities, all of which can be costed as benefits of early school-based prevention efforts. Likewise, pre- and postnatal home visits by public/ community health nurses not only reduce maternal substance use and arrest rates, of the mother and eventually the child, but also reduce rates of substantiated child abuse and neglect that represent additional cost savings of this approach. A comprehensive costing of the benefits of a preventative approach is beyond the scope of the present report but more fully accounting benefits should be a longer-term goal in prevention planning.

The present report has provided important information that is relevant to the targeting of prevention investment through further analysis of a major Australian data set on risk, protection and adolescent problem behaviours. The analysis examined the extent to which drug prevention policy should be *universal* in its application, or *targeted* to high-risk populations. It is clear that for regular smoking and heavy alcohol use, most adolescents exhibiting these behaviours by age 16 were either average or low on a cumulative index that summed risk and protective factors. For weekly cannabis use, most youth reporting this behaviour were classified as high-risk, for all age groups. The trend in the data was for the number of low and average-risk children to be weekly cannabis smokers to increase with increasing age, suggesting that if age had increased further, they would have been in the majority. By contrast, for the other illicit drugs

combined, there was a clear tendency for weekly users to be predominantly high-risk children, at all ages. In summary, the prevention paradox holds for the legal drugs, and may hold for older teenagers in relation to cannabis, but does not hold for other illicit drugs.

The above evidence suggests that whole-of-population, or universal strategies, are of particular importance in relation to reducing the more prevalent harms associated with tobacco and alcohol use. However, strategies targeted to high-risk children and adolescents may be necessary in preventing the harms associated with illicit drug use. As high-risk youth generally have high levels of drug use, the more targeted strategies will also benefit the prevention of harms associated with legal drugs and cannabis. To maximise their effectiveness, targeted strategies should be initiated early in the developmental pathway and aim to reduce risk factors, enhance protective factors and prevent or delay drug use. Where drug use is evident, interventions should continue through into protective strategies, aiming to contain the emergence of risky patterns of drug use or to reduce the likelihood of harm.

15.8 The evidence base for drug prevention (PART 4)

Evidence was summarised for the relative effectiveness of interventions and policies, from pre-conception through to prenatal care, antenatal care, infancy, pre-primary, primary school, adolescence, young adulthood, adulthood and old age. The quality of the research was highly variable. The types of outcomes examined ranged from: known risk factors for later drug use, age of onset of use of different drugs, intensity of drug use, to dependence and experiences of problems relating to drug use. In some areas, it was possible to recommend wide implementation with confidence, in others there was theoretical support for recommending that interventions be trialled, and in yet others there was no relevant literature upon which to draw information. In well-researched areas, such as school-based drug education and community action, it is possible to identify principles to guide effective practice as well as descriptions of model projects. In other areas, it was possible to identify individual strategies that, if implemented, would definitely have preventive benefit. The evidence base will now be briefly summarised for each of the major areas examined.

15.8.1 The evidence for investment in early life-stage interventions (Chapter 7)

Information summarised in this report suggests a range of opportunities for encouraging healthy child development, and thereby preventing children's drug use and progression to heavy and harmful use. Prior to birth, and also in childhood, the healthy development of children can be impaired through parental tobacco, alcohol and illicit drug use. Further innovation investment will be required to develop and evaluate health service reorientation programs that can be effectively applied to address these problems.

Programs of structured home visits to support mothers, before and in the first two years after birth, have evidence supporting their effectiveness when targeted to vulnerable families. These programs offer basic advice, practical assistance with nursing, and advocacy for access to services. They show evidence of positive outcomes for maternal drug use and infant health. Some programs targeted specifically at vulnerable (e.g. drug using) mothers have shown benefits for later problem behaviours in childhood and adolescence, including some modest reductions in drug use. A promising yet currently under-utilised approach involves targeting parent education and support within drug treatment populations. A coordinated investment to ensure healthy child development in drug treatment settings is warranted.

There is evidence for positive outcomes (school adjustment and academic attainment) and good cost-benefit ratios from targeted programs to prepare children from high-risk families for primary school. There is also substantial evidence for the value of both universal and selective parenting programs for pre-primary school age children on similar outcome variables.

Strong evidence exists for both universal and targeted programs to support parents and strengthen families of primary school children. Outcomes from these studies have been documented by following children through to adolescence. Results have found reduced smoking and alcohol use as well as reductions in other adolescent problem behaviours.

15.8.2 Investment in adolescent interventions (Chapter 8)

There is now an emerging evidence base for universal interventions focusing on adolescents' use of alcohol and tobacco. A combination of well-designed and executed regulatory approaches supported by other components, such as school-based interventions, holds the most promise. A strong research tradition relates to the evaluation of classroom-based school drug education programs. While once regarded as an area with little promise and a weak evidence base, more recent programs developed in Australia and the US have shown positive outcomes, particularly in terms of reductions in tobacco use. An Australian study has demonstrated reductions in risky alcohol use and alcohol-related harms. A clear set of principles has been developed, based on the international literature, for application in Australian school curricula.

Available evidence revealed very strong support and a sound rationale for the enforcement of laws prohibiting sales of tobacco and alcohol to persons under legal purchasing age for these legal drugs. Similarly, there is evidence for the effectiveness of measures that control the price of alcoholic drinks favoured by young people.

There is evidence encouraging the further evaluation of parent education approaches and for further application and evaluation of family interventions to address illicit drug use. Some evidence provides support for the further evaluation of community mobilisation/community action approaches, social marketing and health service reorientation; and, in particular, of brief intervention approaches for heavy alcohol users. There is more limited evidence, but strong theoretical grounds, for further evaluating school organisation and policy approaches to minimise drug use and harm and encourage alternative drug-free recreational pursuits.

15.8.3 Investment in broad-based interventions with potential benefits across multiple problem areas (Chapter 9)

There are at least three main ways in which common benefits can be obtained through broad-based preventive interventions addressing a wide range of health, social and criminal problem behaviours.

Firstly, there are benefits associated with universal programs to reduce or eliminate the social and

developmental risk factors that predict the development of problem behaviours. For example, broad social and economic policies that seek to improve conditions for the healthy development of children and youth, reduce disadvantage, increase equity, and strengthen community will have a range of benefits including lower rates of use of both illicit and licit drugs and of the attendant consequences. There is a special urgency in relation to addressing these issues as they affect Indigenous Australians.

Secondly, benefits can be obtained through programs that target individuals and groups with a high number of developmental risk factors. Settings include disadvantaged areas, family crisis, police and court contacts, and mental health. Strategies to ensure ready access to services and to reduce risk and enhance protective factors in children, families and communities, are warranted in these settings. As mentioned above, there is particular promise from the wider application of targeted programs to prepare disadvantaged children for school and to enable parents to manage behavioural problems in primary school age children. As these programs have the potential to reduce risk factors that predict the emergence of harmful drug use, investment aimed at reducing drug-related harm should form a component in these investments.

Thirdly, benefits are available through programs for adolescents and adults that have high rates of drug-related harm. Programs for these populations focus on immediate protective strategies and may coordinate to address physical and mental health problems, including levels of drug use. Examples include broad-based health promotion interventions delivered by primary care health professionals such as general practitioners, occupational health workers; community-wide health screening; and brief intervention programs. The potential public health benefits for the broad application of screening and brief intervention programs, targeting a range of health risk behaviours, has not yet been realised in Australia. Programs such as the SNAP initiative are under way to encourage greater dissemination.

Our investigation of broad-based prevention suggested important commonalities between efforts to prevent drug-related harm and other prevention efforts relevant to crime, mental health and physical health. Planning mechanisms that encourage combined prevention investments from jurisdictions concerned with mental health, crime and health would appear warranted, supporting community efforts to prevent youth drug use.

15.8.4 Investment in universal regulatory interventions for legal drugs across all age groups (Chapter 11)

Regulation of the supply of both tobacco and alcohol products, supported by a range of public education measures, is strongly supported in the research literature. Both tobacco and alcohol behave like other products in the market place in that the level of demand is strongly influenced by price. Young people, as well as heavy drinkers and smokers, are most affected by price increases. At present there are consistent taxation policies in place to maintain the high price of cigarettes in Australia that should be sustained. For alcohol, from a public health point of view there are sound policies in place in relation to beer and spirits, in that lower taxes are paid on lower alcohol content drinks (through excise taxes). However, there is a weakness in current policy with the absence of an alcohol content-based tax (excise or other) on wines. This results in the availability of very cheap bulk wines that are favoured by vulnerable groups and problem drinkers.

The use of hypothecated taxes from tobacco and alcohol has a significant tradition in Australia, with a strong rationale and degree of supporting evidence of effectiveness. While a proportion of beer taxes collected in the year 2000/01 was hypothecated to form the Alcohol Education and Rehabilitation Foundation, there is no continuing hypothecation of either tobacco or alcohol taxes at the national level; such taxes are no longer permitted by law at the State/Territory level.

Restrictions of sales of both alcohol and tobacco to minors can be effectively enforced. There is community support for strict enforcement of these laws but also evidence, especially in relation to alcohol, that underage youth access is relatively easy. There is also evidence that enforcing laws on serving intoxicated customers can be achieved effectively. In both cases, law enforcement approaches, with or without education, are more effective than education alone (e.g. through responsible service training). Enforcement of liquor laws is a prerequisite of effective management of licensed establishments, with Accords and responsible service training programs providing a supporting role.

Physical availability of alcohol, in terms of numbers of outlets and hours of sale, has increased in Australia over the last decade. Australian and overseas evidence clearly identifies late night trading for hotels and nightclubs as a source of

alcohol-related violence and road trauma. There is also evidence to support controls on outlet density. No operational model for achieving this has been developed and there are currently inadequate information systems in some licensing authorities to enable identification of high-risk premises, so as to determine whether they should continue trading.

The development and enforcement of laws to punish and deter drink-driving in Australia have been major successes for public health and safety, with uniform laws in place across Australia. Continued implementation and monitoring for quality control is of great importance.

15.8.5 Investment in other universal interventions for legal drugs across all age groups (Chapter 11)

There is strong evidence that includes Cochrane reviews, to show that public education campaigns can contribute to reductions in smoking and risky alcohol use, especially if campaigns support other policy measures such as tax increases and law enforcement. Education about some aspects of tobacco and alcohol use can also be seen as a prerequisite for a range of other system-wide interventions and, as such, are hard to evaluate as isolated strategies. National Alcohol Guidelines are one such example. Advice about low-risk drinking levels and various health risks are fundamental to the delivery of educational messages: through the media, by a range of health professionals in primary, secondary and tertiary care, and in a range of health and community settings. Wide dissemination, therefore, supports other evidence-based activities. Australia introduced standard drink labelling as one dissemination strategy to support drinkers to apply national drinking guidelines, though the current labels need only be 1.5mm high. Labelling is an efficient means of delivering health messages to smokers and drinkers, but it is hard to evaluate as an isolated strategy. The extent to which labelling supports, and could support other evidence-based interventions should be investigated. Similarly, media campaigns need to be developed to facilitate other national strategies, regulatory interventions and core health messages.

There is a developing evidence base, mainly from overseas studies, that the community is an effective location for organising and delivering prevention measures targeted at legal drugs, especially alcohol. This tradition has matured to the extent that a set of guiding principles for sound process, optimal content and good outcomes can be distilled. The weight of published evidence suggests that

community-based interventions that target structural policy change at the local level are more effective than approaches with the less focused aim of community mobilisation. Thus, community action to: restrict trading hours in high-risk communities, increase enforcement of drink-driving and liquor laws, and restrict local alcohol availability, are reported to have achieved the most positive results. This is also one of the few areas of demonstrated benefit for interventions within Indigenous communities. Programs such as Communities That Care are being implemented in Australia and combine elements of community mobilisation and structured community action. By supporting local coalitions to tailor evidence-based prevention strategies to local conditions, these programs hold the promise of encouraging a well-coordinated selection of prevention strategies.

15.8.6 Investment in universal regulatory policies regarding illicit drugs (Chapters 12 and 13)

Laws shape community values and opinions about drug use. On the one hand, laws express social disapproval that reinforces social norms against illicit drug use and, on the other hand, they act as a deterrent against use. The role of law enforcement in prevention thus goes beyond apprehending drug users and dealers. The current Diversion Initiative demonstrates the importance of the law enforcement role in the apprehension of early users and referral to education, treatment or/and support.

The impact of laws prohibiting the sale, supply and use of certain drugs is very hard to ascertain from current scientific evidence. These laws and styles of enforcement have evolved in many countries, mostly over the past 100 years, in response to the increasing availability of a range of psychotropic substances for recreational and non-medical use. When use of a substance is illegal, there are substantial barriers to overcome in order to obtain reliable and valid data about patterns of use. Furthermore, when prevalence of use is quite low, as is the case for opiate drugs, it becomes expensive to obtain accurate prevalence estimates from national surveys. A recent high-level inquiry, conducted by the US Academy of Sciences¹⁷⁶ into the scientific status of US illicit drug policy, could identify very little rigorous research data on patterns of use, impact of prevention programs, drug purity levels, drug-dealing and law enforcement. The report noted that most of what is 'known' about the prevention of illicit drug use and harm is from the better documented experiences with legal drugs.

Economic modelling from black markets in other commodities (tea, coffee and tobacco) suggests that rendering a substance illegal results in substantial increases in its price. A major investment in improved research is emphasised in the present report as a method of improving the future evidence base for illicit drugs policy.

The available Australian research has not been able to identify measurable impacts of law enforcement strategies on levels of drug purity or use, but this is not to say that these effects do not occur. There is evidence that contact with law enforcement can encourage participation in treatment but it may also increase risky drug use practices.

While the published evidence regarding street-level drug law enforcement is weak, there is support for the notion that drug laws may provide a general degree of deterrence to the population who are not engaged in drug use. However, as a consequence of the difficulty of preventing more than a small minority of drug deals, there is little evidence for specific deterrence (i.e. deterring drug users who come into contact with the law from re-offending).

There is a small literature evaluating the impact of changing the precise legal status of cannabis, including some important Australian studies and reviews. These indicate that moving from criminal to civil penalties for use and possession of small quantities of cannabis is not associated with significant increases in prevalence of its use. Along with other European countries, Australian States have variously moved to 'soften' policing of cannabis laws, in some instances introducing cautioning schemes for first time offenders (e.g. Victoria), in others by decriminalised possession of small quantities (SA and ACT). WA proposes to introduce decriminalisation, for which there will be a rigorous evaluation of intended and unintended consequences using baseline data already collected.

In relation to the effectiveness of community-based and educational initiatives in the mass media and in schools regarding illicit drugs, as noted by the recent US Academy of Sciences report, most of what is known has been applied from research focusing on legal drugs. To increase the chances of success, broad principles can be applied from the areas of community action, mass media campaigns and school-based programs, and these have been outlined in earlier chapters. However, when it comes to the issue of the component parts of these programs, there is a dearth of scientific data.

15.8.7 Investment in treatment and brief interventions for adults with drug problems (Chapter 10)

There are important intersections between the aim of population-level prevention of drug-related harm and what has traditionally been considered to be treatment. Emerging evidence suggests that investment in various forms of treatment will have benefits in terms of community-level reductions in crime, road trauma, hospital admissions and other serious drug-related harms.

There is an enormous potential to enhance these savings at the community level, in three main ways:

1. expanding brief intervention programs targeting smoking and risky drinking, to a wide range of primary health care, workplace and other community-based settings,
2. ensuring that treatment programs offered include approaches with the strongest evidence-base and are made widely accessible, perhaps through a greater emphasis on delivery at the community- rather than institutional-level,
3. incorporating interventions to support children in families with drug-using parents, in order to attempt to break inter-generational patterns of transmission of problem drug use.

This last point is important for prevention. Smoking, risky drinking and drug use by parents and other significant adults is associated with increasing developmental risk factors for children. This means that there are important yet currently neglected opportunities to target prevention programs in drug treatment settings (Chapter 8).

If drug treatment programs for adults and families are to realise their potential for preventative benefits for children, then they should be designed with prevention in mind. Treatment activities should include interventions to reduce developmental risk factors and enhance protective factors, and a more careful analysis of treatment impacts on children should be encouraged in evaluations.

15.9 Indigenous people and drug prevention

There have been few formal evaluations of Indigenous intervention projects—a fact highlighted in various reviews summarised earlier. The majority of available evaluations have examined evidence for impacts on patterns of drug use and related harms, but not on fundamental social and environmental conditions that contribute to these problems. However, the evaluations that have been undertaken have reached a number of similar conclusions about what makes an intervention effective.^{233, 869, 988, 989, 1139} First and foremost among these is the support of, and control by, local communities. A prime example relates to the effectiveness of community-initiated local restrictions on alcohol availability. Given the diversity within the Indigenous population, interventions must be tailored to the needs of particular communities. Importantly, interventions need to be adequately resourced and supported. This entails not only funding for project activities, but providing appropriate staff training and support.

In the past 10 years or so, there have also been a number of reports and submissions that include recommendations to address substance misuse among Indigenous Australians.^{292, 331, 1140, 1141} The recommendations contain a wealth of detail that can usefully form the basis for any strategy to prevent substance misuse and related harm among Indigenous Australians. While many recommendations remain to be implemented, several key themes emerge. The first is the need to address the underlying social determinants of Indigenous inequality. This includes the call for real, but appropriate, economic development for Indigenous people. This call is not new but, recently, has been forcefully made by Noel Pearson.²⁹⁴

The second theme emerging is the need for Indigenous people to be involved, as equal partners, at all stages in the development and implementation of strategies to address substance misuse. There is evidence from both Australia and overseas of the efficacy of Indigenous ownership and control of interventions addressing ill-health—this includes the importance of giving preferential employment in government agencies providing services for Indigenous peoples.¹¹⁴²

As important as Indigenous involvement is, it is insufficient without adequate resourcing—the third theme to emerge from recommendations to address substance misuse. The Commonwealth Government

has asserted that there has been an increase in funds expended on Indigenous affairs over the past three decades. However, a substantial amount of the expenditure identified as specifically directed for Indigenous welfare should arguably have been the routine responsibility of other Government departments. In other words, there has been a misleading impression of Indigenous people receiving extra funding over and above that received by other Australians.¹¹⁴³ Whatever the levels of funding for Indigenous affairs over the past three decades, the expenditure has failed to meet the well-documented needs or to remedy the social and economic inequalities that underlie and perpetuate the high levels of substance misuse among Indigenous Australians. This inadequacy of funding has also been identified with regard to funding for both Indigenous health services^{1144, 1145} and Indigenous substance misuse services.^{859, 869}

An important component of adequate resourcing is the building of capacity to continue to provide adequate and appropriate services within communities and community organisations. This includes infra-structural development, research capabilities, and staff development and support. With regard to the latter, despite several project evaluations highlighting the shortage of staff with adequate training,^{869, 1146} in 1999/2000, less than 3% of funds for projects directly targeting Indigenous substance misuse was allocated to staff development and support.⁸⁵⁹

Over the past three decades, government Indigenous health and substance misuse policy has acknowledged a link between substance misuse and underlying social issues. However, despite this acknowledgement, substance misuse policy and service planning has largely been developed in isolation from policies in other portfolio areas, such as land, employment, education and housing. Furthermore, substance misuse services have been implemented inconsistently across different regions of Australia, as attested by the mismatch between regional funding allocations and population levels.⁸⁵⁹ Concerns over such problems underlie the fourth theme to emerge from those reports making recommendations to address Indigenous substance misuse. That is the need for a holistic and coordinated approach that includes Indigenous community-controlled organisations, all levels of government, and all sectors.

In looking to the future, experience with community action frameworks provides a promising approach for integrating future prevention investment within the Indigenous

population. The emphasis within the Communities That Care program on the empowerment of local coalitions, and on evidence-based investment tailored to local evidence of elevated risk factors and depressed protective factors, appears to bring together many of the principles outlined above.

15.10 Conclusions

The present document has been prepared to summarise the existing evidence base regarding 'what works' in the prevention of substance use problems, so that a comprehensive and national prevention agenda can be implemented with synergistic actions across multiple government departments and sectors of society. This agenda must acknowledge the broad social and structural determinants known to influence patterns of drug use and related harm.

It must also acknowledge the:

- various early developmental experiences and circumstances that serve to create risk or protection for the individual later in life,
- extent to which these are common across diverse problem areas, such as mental health, crime, health and welfare,
- nature and extent of the harms associated with the use of different drugs and the patterns of use, and
- circumstances of drug use that create the risk of these harms occurring.

The agenda will then need to identify opportunities for remedying risk and increasing protection across all sectors of society and government, so as to contribute to a national effort to reduce drug-related harm. The evidence for informing this process has been provided in the foregoing pages.

Table 15.1 breaks down different objectives for different policy jurisdictions and operational settings within a Protection and Risk Reduction Approach to Prevention. This table indicates that an important goal for supply reduction strategies is the achievement of a well-coordinated set of operations and activities at the community level. By emphasising integration at the community level, synergies between supply control, demand reduction and harm reduction programs can be established. Program objectives for children include use reduction and may be different from the objectives for adults, where harm reduction goals become more prominent.

Table 15.1 Objectives for different policy jurisdictions and operational settings within a Protection and Risk Reduction Approach to Prevention

Setting	Supply control	Demand reduction / social improvement	Reduction of harm
National and State objectives	Coordinated policies and strategies for supply control. Integrated operation of border control, drug control (policies, laws and regulation), taxes and excise; social marketing and media controls.	Effective and coordinated policies and strategies for reduction of demand and social improvement. Integrated expenditure on health, mental health, welfare, education, prevention.	Effective and coordinated policies and strategies to reduce harm, including police (e.g. drink-drive programs), treatment programs (methadone), courts (diversion), prisons.
Local community objectives	Effectively planned and locally coordinated supply reduction programs.	Well-planned and coordinated strategies for investment in social improvement and prevention. Reduction of local risk factors and enhancement of protective factors.	Effective and coordinated local strategy for reducing drug-related harms.
Local community activities	Licensing and enforcement, policing, distribution (alcohol, tobacco, other drugs).	Targeted early childhood programs. Parent education. Schools drug-education and organisation. Social opportunities, employment.	Community safety, needle exchange, alcohol server training.
Objectives for families and adults	Availability and price of drugs to reflect evidence for their harms.	Enhanced social connection. Patterns of drug use within public health guidelines.	Reduction in risky drug use and harm.
Objectives for children and young people	Drugs unfashionable and difficult to access.	Healthy social development.	Less drug use, delayed age of first drug use, less frequent and more moderate drug use.

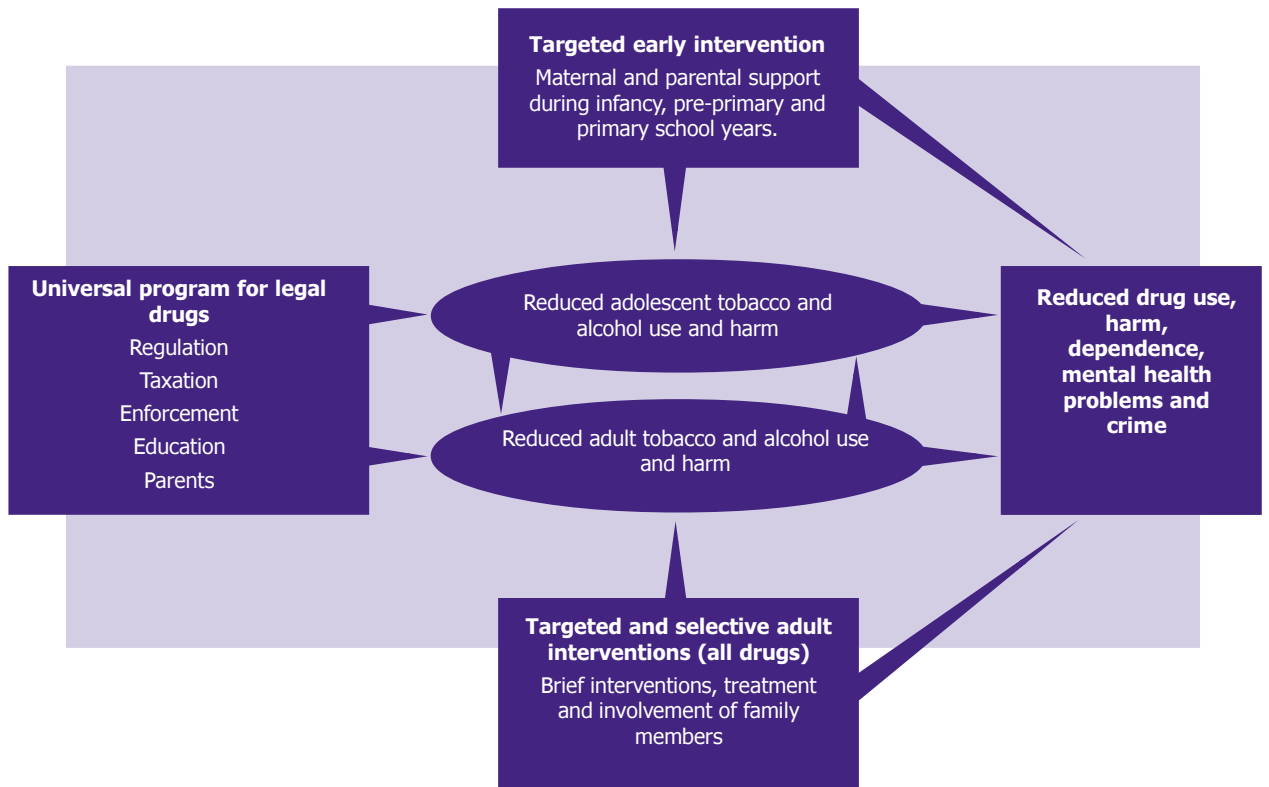
Figure 15.1 (p. 251) also provides a summary of the main opportunities for continued and enhanced investment to prevent drug-related harms. The figure depicts an integrated relationship between children's drug use and the patterns of drug use modelled more broadly by adults. Furthermore, it reflects the literature, which suggests that effective legal drug control influences illicit drug use and harm, and that a carefully coordinated mix of investment, rather than any single service strategy, has the greatest chance of success. The program complexity once again suggests the importance of tailoring the mix of investment to the specific and distinct needs of particular communities.

The Protection and Risk Reduction Approach to Prevention holds advantages, not simply for reducing the harm to Australian society from drug use, but also for broader social improvement goals. Investments in prevention should aim to maximise the potential for early childhood development, while also acknowledging that development and socialisation have ongoing threads in later years. By supporting communities to address both the developmental needs of children and the broader

social conditions relevant to public safety and social connection, a combination of benefits can be achieved. These benefits range from the maximising of human potential through to increasing productivity and achievement, with ultimate outcomes for improving both the wealth and wellbeing of the nation.

There are synergies between the prevention of drug-related use, risk and harm and the prevention of homelessness, crime, cardiovascular disease, cancer, injuries, mental illness and suicide, many of which share underlying theoretical frameworks. The Protection and Risk Reduction Approach to prevention has the potential to integrate these varying frameworks, providing an important basis for improving coordination between different prevention strategies. A closer link between research and service delivery has the potential to strengthen prevention policy by better defining strategy combinations that are effective in reducing drug-related harm.

Figure 15.1 A summary of main categories of intervention recommended for continued and enhanced investment



APPENDICES

APPENDIX A TOBACCO—ADOLESCENTS

Appendix A summarises a selection of behavioural follow-up research studies relevant to the consequences of different patterns of adolescent tobacco use on subsequent development. Note, in interpreting this table, symbols are used to summarise the effect of earlier behaviour on later development. The symbol ‘Y’ indicates a significant effect; ‘N’ a non-significant effect; the letter ‘a’ indicates analyses were adjusted for other factors (i.e. multivariate methods used); and ‘u’ indicates that analyses were unadjusted.

Appendix A Consequences of youth tobacco use for later behaviour and health and social functioning

Baseline age	Tobacco use behaviour	Effect ¹	Follow-up age	Consequences	Reference	Cohort
Alcohol						
Prior to 17	Early use	Nu	prior to 35	Alcohol	Kandel ¹²¹	New York
17	Frequent (not poly-drug)	Na	21	Frequent alcohol use	Newcomb ¹²⁴	Los Angeles
18	Daily	Yu	21	Alcohol dependence	McGee ¹²²	Dunedin NZ
18.5	Dependent	Nu	24.5	Alcohol abuse & dependence	Jackson ¹²⁰	Midwest US
Tobacco						
11	Early use	Yu	15	Tobacco use	Miller-Johnson ¹²⁶	North Carolina
Prior to 13	Early use	Ya	16	Tobacco dependence	Costello ¹¹⁸	Western North Carolina
14.5	Less than daily	Ya	17	Tobacco daily	Patton ¹¹⁹	Australia, VAHC
Cannabis						
14	Daily	Ya	15	Frequent cannabis use	Coffey ¹²³	Australia, VAHC
15	Daily	Nu	16 to 17	Daily cannabis use	Coffey ¹²³	Australia, VAHC
Prior to 17	Early use	Nu	prior to 35	Cannabis use	Kandel ¹²¹	New York
17	Frequent (not poly-drug)	Ya	21	Frequent cannabis use	Newcomb ¹²⁴	Los Angeles
15	Use	Ya	18	Cannabis use	McGee ¹²²	Dunedin NZ
18	Daily	Ya	21	Cannabis use	McGee ¹²²	Dunedin NZ
Illicit drug use						
Prior to 14	Early use	Ya	17.5	Poly-drug use	Guy ¹⁴⁸	Boston
14	Frequent (not poly-drug)	Na	22	Drug problems	Newcomb ¹³³	Los Angeles
16	Use	YuNa	32	Heroin use	Johnson ¹¹⁷	Chicago
17	Frequent (not poly-drug)	Na	21	Frequent illicit use -	Newcomb ¹²⁴	Los Angeles
Prior to 17	Early use	Nu	prior to 35	Illicit drug use	Kandel ¹²¹	New York
Prior to 17	Early use	Yu	prior to 35	Prescribed psychoactive drugs	Kandel ¹²¹	New York
17	Frequent (not poly-drug)	Na	25	Illicit drug problems	Newcomb ¹²⁴	Los Angeles

Baseline age	Tobacco use behaviour	Effect ¹	Follow-up age	Consequences	Reference	Cohort
Health problems						
14	Frequent (not poly-drug)	Na	25.5	Accidents	Guy ¹²⁷	Boston
14	Frequent (not poly-drug)	Ya	25.5	Respiratory problems	Guy ¹²⁷	Boston
14	Frequent (not poly-drug)	Ya	22	Health problems	Newcomb ¹³³	Los Angeles
Mental health						
13 to 16	Use	Ya	21	Difficult temperament	Lerner ¹⁴⁴	New York
14	Frequent (not poly-drug)	Na	25.5	Mental health problems	Guy ¹²⁷	Boston
14	Frequent (not poly-drug)	Ya	22	Emotional distress & psychosomatic problems	Newcomb ¹³³	Los Angeles
15	Daily	Ya	18	Mental health problems	McGee ¹²²	Dunedin NZ
16	Frequent	Ya	22	Antisocial personality disorder	Brook ¹³⁸	Upper New York counties
16	Frequent	Na	22	Anxiety disorder	Brook ¹³⁸	Upper New York counties
16	Frequent	Ya	22	Major depression	Brook ¹³⁸	Upper New York counties
18	Daily	Yu	21	Anxiety/depression	McGee ¹²²	Dunedin NZ
Crime and social problems						
14	Frequent (not poly-drug)	Ya	22	Social problems	Lerner ¹⁴⁴	Los Angeles
17	Frequent with alcohol	Ya	22	Crime – general deviance	Guy ¹²⁷	Los Angeles

¹

Y a significant effect

N not significant

a analyses were adjusted for other factors (i.e. used multivariate methods)

u analyses were unadjusted.

APPENDIX B ALCOHOL—ADOLESCENTS

Research has examined the consequences of adolescent alcohol use for the development of more extreme alcohol use behaviours and also for tobacco use, illicit drug use and cannabis use. The other consequences that have been explored include mental health, health and social problems. Table B summarises the current findings.

Appendix B Follow-up studies examining developmental consequences of adolescent alcohol use behaviours

Baseline age	Alcohol use behaviour	Effect ¹	Follow-up age	Consequences	Reference	Cohort
Alcohol						
Prior to 6	Early use	Ya	15	Alcohol harms	Fergusson ¹²⁵	Christchurch NZ
Prior to 6	Early use	Ya	15	Frequent alcohol	Fergusson ¹²⁵	Christchurch NZ
Prior to 6	Early use	Ya	15	Amount alcohol	Fergusson ¹²⁵	Christchurch NZ
Prior to 9	Early use	Na	16	Alcohol dependence	Costello ¹¹⁸	Western North Carolina
10	Frequent	Na	21	Alcohol abuse/dependence	Guo ¹²⁹	Seattle
10	Frequent	Na	21	Alcohol dependence	Guo ¹²⁹	Seattle
11	Early use	Yu	15	Alcohol use	Miller-Johnson ¹²⁶	North Carolina
13–18	Binge	Ya	21	Alcohol abuse/dependence	Hill ¹³⁰	Seattle
13	Use	Ya	14 to 15	Harms	McBride ¹⁵⁵	Australia, SHAHRP
Prior to 14	Early use	Ya	14	Quantity and Frequency	Fergusson ⁴⁸⁴	Christchurch NZ
14	Frequent (not poly-drug)	Ya	25.5	Alcohol harms - health problems	Guy ¹²⁷	Boston
14	Quantity and frequency	Ya	16	Abuse	Fergusson ⁴⁸⁴	Christchurch NZ
14	Frequent	Ya	21	Alcohol abuse/dependence	Guo ¹²⁹	Seattle
14	Frequent	Ya	21	Alcohol dependence	Guo ¹²⁹	Seattle
16	Frequent	Ya	21	Alcohol abuse/dependence	Guo ¹²⁹	Seattle
16	Frequent	Ya	21	Alcohol dependence	Guo ¹²⁹	Seattle
17	Frequent (not poly-drug)	Ya	25	Alcohol & cannabis problems	Newcomb ¹²⁴	Los Angeles
18	Use	Yu	21	Alcohol dependence	McGee ¹²²	Dunedin NZ
18	Amount	Ya	21	Harms	Casswell ¹²⁸	Dunedin NZ
20	Quantity and frequency	Yu	26	Subsequent pattern of alcohol use	Pape ⁴⁸⁷	Norway
Tobacco use						
9,11,13	Use	Yu	10 to 15	Tobacco 90 days	Casswell ¹²⁸	Western North Carolina
9,11,13	Recent (90 days)	Yu	10 to 15	Tobacco 90 days	Casswell ¹²⁸	Western North Carolina
prior to 17	Early use	Nu	prior to 35	Tobacco use	Kandel ¹²¹	New York
17	Frequent (not poly-drug)	Na	21	Frequent tobacco use	Newcomb ¹²⁴	Los Angeles
18.5	Alcohol abuse & dependence	Yu	24.5	Tobacco dependence	Jackson ¹²⁰	Midwest US
Cannabis use						
9,11,13	Use	Yu	10 to 15	Recent cannabis use (last 90 days)	Casswell ¹²⁸	Western North Carolina

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Baseline age	Alcohol use Effect ¹ behaviour		Follow-up age	Consequences	Reference	Cohort
Cannabis use						
9,11,13	Recent (90 days)	Yu	10 to 15	Recent cannabis use (last 90 days)	Casswell ¹²⁸	Western North Carolina
14	Frequent	Ya	15	Frequent cannabis use	Coffey ¹²³	Australia, VAHC
14	Amount	Ya	15	Frequent cannabis use	Coffey ¹²³	Australia, VAHC
14	Amount	Ya (Females)	16 to 17	Daily cannabis use	Coffey ¹²³	Australia, VAHC
prior to 17	Early use	Yu	prior to 35	Marijuana	Kandel ¹²¹	New York
17	Frequent (not poly-drug)	Na	21	Frequent cannabis use	Newcomb ¹²⁴	Los Angeles
18	Use	Yu	21	Cannabis use	McGee ¹²²	Dunedin NZ
18	Use	Yu	21	Cannabis dependence	McGee ¹²²	Dunedin NZ
18	Dependence	Yu	21	Cannabis or alcohol dependence	Krueger ¹³²	Dunedin NZ
Illicit drugs						
14	Frequent (not poly-drug)	Na	22	Drug problems	Newcomb ¹³³	Los Angeles
16	Use	YuNa	32	Heroin use	Johnson ⁴⁶⁴	Chicago
prior to 17	Early use	Yu	prior to 35	Psychoactive pharmaceutical	Kandel ¹²¹	New York
prior to 17	Early use	Yu	prior to 35	Illicit drug use	Kandel ¹²¹	New York
17	Frequent (not poly-drug)	Na	21	Frequent illicit drug use	Newcomb ¹²⁴	Los Angeles
17	Frequent (not poly-drug)	Na	25	Illicit drug problems	Newcomb ¹²⁴	Los Angeles
Health problems						
14	Frequent (not poly-drug)	Na	25.5	Health problems	Guy ¹²⁷	Boston
14	Frequent (not poly-drug)	Na	22	Health problems	Newcomb ¹³³	Los Angeles
Mental health						
9,11,13	Use	Yu	10 to 15	Psychiatric diagnosis	Federman ¹³¹	Western North Carolina
prior to 14	Early use (mother or father)	Yu(males)	Next generation 14	Externalising disorders (CD, ODD)	McGue ⁴⁹⁰	Minnesota
prior to 14	Early use (mother or father)	Nu	Next generation 14	Internalising disorders (depression, anxiety)	McGue ⁴⁹⁰	Minnesota
14	Frequent (not poly-drug)	Na	25.5	Mental health problems	Guy ¹²⁷	Boston
14	Frequent (not poly-drug)	Na	22	Mental health problems	Newcomb ¹³³	Los Angeles
15	Use	YuNa	18	Mental health problems	McGee ¹²²	Dunedin NZ
16	Heavy use	Ya	22	Antisocial personality disorder	Brook ¹³⁸	Upper New York counties
16	Heavy use	Na	22	Major depression	Brook ¹³⁸	Upper New York counties
16	Heavy use	Ya	22	Anxiety disorder	Brook ¹³⁸	Upper New York counties
18	Use	Nu	21	Anxiety/depression	McGee ¹²²	Dunedin NZ

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Baseline age	Alcohol use behaviour	Effect ¹	Follow-up age	Consequences	Reference	Cohort
Mental health						
13 to 16	Use	?	21	Difficult temperament	Lerner ¹⁴⁴	New York
13 to 18	Frequent	Na	18 to 23	Depression	Chassin ¹⁴⁷	Arizona
13 to 18	Frequent	Na	18 to 23	Anxiety disorder	Chassin ¹⁴⁷	Arizona
13–18	Binge	Na	21	Depression	Hill ¹³⁰	Seattle
Crime						
15	Quantity and frequency	Ya	16	Property offending	Fergusson ¹⁴⁸	Christchurch NZ
15	Quantity and frequency	Ya	16	Violent offending	Fergusson ¹⁴⁸	Christchurch NZ
18	Frequent with tobacco	Ya	22	Crime - general deviance	Newcomb ¹⁴⁵	Los Angeles
13–18	Binge	Na	21	Crime	Hill ¹³⁰	Seattle
School						
11 to 15	Frequent	Na	1 year lags	Attitudes to school	Andrews ¹⁴⁹	Northwest, USA
11 to 15	Frequent	Nu	1 year later	Academic motivation	Andrews ¹⁴⁹	Northwest, USA
13–18	Binge	Ya	21	High school retention	Hill ¹³⁰	Seattle
Social						
13	Quantity and frequency	Yu	14 to 19	Sexual victim	Pederson ¹⁵⁰	Oslo, Norway
13	Use	Yu	14 to 19	Sexual victim	Pederson ¹⁵⁰	Oslo, Norway
14	Frequent (not poly-drug)	Na+	22	Social problems	Newcomb ¹³³	Los Angeles

¹

- Y a significant effect
N not significant
a analyses were adjusted for other factors (i.e. used multivariate methods)
u analyses were unadjusted.

APPENDIX C CANNABIS—ADOLESCENTS

Research has examined the consequences of adolescent cannabis use for the development of later drug use behaviours, and also for mental health, health and social consequences. Table C summarises the current findings.

Appendix C Follow-up studies examining developmental consequences of adolescent cannabis use behaviours

Baseline age	Cannabis use behaviours	Effect ¹	Follow-up age	Consequences	Reference	Cohort
Alcohol						
15	Earlier age	YuNa	16	Alcohol abuse	Fergusson ¹⁵⁹	Christchurch NZ
15–16	Frequency	Na	16–18	Alcohol abuse/dependence	Fergusson ¹⁵⁶	Christchurch NZ
prior to 17	Earlier age	Nu	prior to 35	Alcohol use	Kandel ¹²¹	New York
17	Frequent (not poly-drug)	Ya	25	Cannabis & alcohol problems	Newcomb ¹²⁴	Los Angeles
17	Frequent (not poly-drug)	Na	21	Frequent alcohol use	Newcomb ¹²⁴	Los Angeles
18	Cannabis or alcohol dependence	Yu	21	Cannabis or alcohol dependence	Krueger ¹³²	Dunedin NZ
Tobacco use						
15	Earlier age	YuNa	16	Tobacco use	Fergusson ¹⁵⁹	Christchurch NZ
prior to 17	Earlier age	Nu	prior to 35	Tobacco use	Kandel ¹²¹	New York
17	Frequent (not poly-drug)	Na	21	Frequent tobacco use	Newcomb ¹²⁴	Los Angeles
Cannabis Use						
11	Earlier age	Yu	15	Cannabis use	Miller-Johnson ¹²⁶	North Carolina
Prior to 13	Earlier age	Na (females) Ya (males)	16	Cannabis abuse & dependence; effect reversed for females	Costello ¹¹⁸	Western North Carolina
14	Weekly	Ya	16 to 17	Daily cannabis use	Coffey ¹²³	Australia, VAHC
15	Frequency	Ya	16 to 17	Daily cannabis use	Coffey ¹²³	Australia, VAHC
15	Earlier age	Ya	16	Cannabis use	Fergusson ¹⁵⁹	Christchurch NZ
17	Frequent (not poly-drug)	Ya	25	Cannabis & alcohol problems	Newcomb ¹²⁴	Los Angeles
18	Cannabis or alcohol Dependence	Yu	21	Cannabis or alcohol dependence	Krueger ¹³²	Dunedin NZ
Illicit drug use						
14	Frequent (not poly-drug)	Ya	25.5	Drug harms	Guy ¹²⁷	Boston
14	Frequent (not poly-drug)	Na	22	Drug problems	Newcomb ¹³³	Los Angeles
15	Frequency	Ya	16	Illicit drug use	Fergusson ⁴⁹²	Christchurch NZ
16	Use	Ya	32	Heroin use	Johnson ¹¹⁷	Chicago
prior to 17	Earlier age	Yu	prior to 35	Illicit drug use	Kandel ¹²¹	New York
prior to 17	Earlier age	Yu	prior to 35	Psychoactive pharmaceuticals	Kandel ¹²¹	New York
17	Frequent (not poly-drug)	Na	21	Frequent illicit drug use	Newcomb ¹²⁴	Los Angeles

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Baseline age	Cannabis use behaviours	Effect ¹	Follow-up age	Consequences	Reference	Cohort
Health problems						
14	Frequent (not poly-drug)	Na	25.5	Health problems - respiratory	Guy ¹²⁷	Boston
14	Frequent (not poly-drug)	Ya	22	Health problems	Newcomb ¹³³	Los Angeles
Mental Health						
13 to 19	Use	Ya	21	Difficult temperament	Lerner ¹⁴⁴	New York
14	Frequent (not poly-drug)	Na	25.5	Mental health problems	Guy ¹²⁷	Boston
14	Frequent (not poly-drug)	Na	22	Mental health problems	Newcomb ¹³³	Los Angeles
15–16	Frequency	Na	16–18	Anxiety disorder	Fergusson ¹⁵⁶	Christchurch NZ
15–16	Frequency	Ya	17–18	Major depression	Fergusson ¹⁵⁶	Christchurch NZ
15–16	Frequency	Na	16–18	Suicide attempts	Fergusson ¹⁵⁶	Christchurch NZ
15	Earlier age	YuNa	16	Mental health problems - depression, suicide, anxiety	Fergusson ¹⁵⁹	Christchurch NZ
15	Use	Na	18	Mental health problems	McGee ¹²²	Dunedin NZ
16	Heavy use	Ya	22	Antisocial personality disorder	Brook ¹³⁸	Upper New York counties
16	Heavy use	Na	22	Anxiety disorder	Brook ¹³⁸	Upper New York counties
16	Heavy use	Na	22	Major depression	Brook ¹³⁸	Upper New York counties
18	Use	Ya	21	Mental health problems	McGee ¹²²	Dunedin NZ
School						
15	Earlier age	YuNa	16	School drop out	Fergusson ¹⁵⁹	Christchurch NZ
15–16	Frequency	Ya	16–18	Early school drop out	Fergusson ¹⁵⁶	Christchurch NZ
16 and prior	Earlier age	Ya	18	School drop out	Bray ¹⁶⁰	South East US
Social						
14	Frequent (not poly-drug)	Ya	22	Family problems	Newcomb ¹³³	Los Angeles
15–16	Frequency	Ya	16–18	Unemployment	Fergusson ¹⁵⁶	Christchurch NZ
Crime						
15	Earlier age	YuNa	16	Police contact	Fergusson ¹⁵⁹	Christchurch NZ
15–16	Frequency	Ya	17–18	Violent offending	Fergusson ¹⁵⁶	Christchurch NZ
15–16	Frequency	Ya	17–18	Property offending	Fergusson ¹⁵⁶	Christchurch NZ

¹

Y a significant effect
N non-significant
a analyses were adjusted for other factors (i.e. used multivariate methods)
u analyses were unadjusted.

REFERENCES

1. Collins DJ, Lapsley HM. *Counting the Costs: Estimates of the Social Costs of Drug Abuse in Australia in 1998-9*. National Drug Strategy Monograph Series No. 49. Canberra: Commonwealth of Australia, 2002.
2. House of Representatives, Standing Committee on Family and Community Affairs. *Where to next? - A Discussion Paper. Inquiry Into Substance Abuse in Australian Communities*. Canberra: Commonwealth of Australia, September 2001.
3. Thorley A. Medical responses to problem drinking. *Medicine* 1980; 35:1816–1822.
4. Epstein EE. Classification of alcohol-related problems and dependence. In Heather N, Peters TJ, Stockwell T (eds) *International Handbook of Alcohol Dependence and Problems*. Chichester: John Wiley and Sons, 2001;47–70.
5. Edwards G, Marshall EJ, Cook CCH. *The Treatment of Drinking Problems: A Guide for the Helping Professions*. 3rd ed. Cambridge: Cambridge University Press; 1997.
6. Lenton S. The essence of prevention. In Wilkinson C, Saunders B (eds) *Perspectives on Addiction, Making Sense of the Issues*. Perth: William Montgomery, 1996;73–80.
7. Holder HD. Prevention of alcohol-related problems. *Alcohol Health and Research World* 1989; 13(4):339–342.
8. Institute of Medicine, Committee on Prevention of Mental Disorders. *Reducing Risks for Mental Disorders: Frontiers for Preventive Intervention Research*. Mrazek PJ, Haggerty RJ (Eds). Washington, DC: National Academy Press, 1994.
9. National Crime Prevention - Attorney-General's Department. *Pathways to Prevention - Developmental and Early Intervention Approaches to Crime in Australia - Full Report*. Canberra: National Crime Prevention - Attorney-General's Department, 1999.
10. Hawkins DJ, Catalano RF, Miller JY. Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychological Bulletin* 1992; 112(1):64–105.
11. Kreitman N. Alcohol consumption and the preventive paradox. *British Journal of Addiction* 1986; 81(3):353–363.
12. McDonald D, Moore R, Norberry J, Wardlaw G, Ballenden N. *Legislative Options for Cannabis in Australia (Monograph No. 26)*. Canberra: Australian Government Printing Service, 1994.
13. Ministerial Council on Drug Strategy. *National Drug Strategic Framework 1998-99 to 2002-03; Building Partnerships. A Strategy to Reduce the Harm Caused by Drugs in our Community*. Canberra: Commonwealth of Australia, November 1998.
14. Toumbourou J, Patton G, Sawyer S, Olsson C, Web-Pullmann J, Catalano R, et al. *Evidence-Based Health Promotion: Resources for Planning No. 2*. Melbourne: Adolescent Health, Health Development Section, Public Health Division, Department of Human Services, 2000.
15. Cochrane Collaboration. Cochrane brochure, nd. Viewed 22 May 2002, <<http://www.cochrane.org/cochrane/cc-broch.htm>>.
16. White JM. Cochrane reviews and evidence-based practice. In Roche A, MacDonald J (eds) *Systems, Settings, People: Workforce Development Challenges for the Alcohol and Other Drugs Field*. Adelaide: National Centre for Education and Training on Addiction, 2001;87–92.
17. Clarke M, Oxman AD. Cochrane Reviewers' Handbook 4.1.1. In *The Cochrane Library, Issue 4*. Oxford: Update Software, 2000.
18. Rehm J. Review papers in substance abuse research. *Addiction* 1999; 94(2):173–176.
19. Oxman AD. Checklists for review articles. *British Medical Journal* 1994; 309:648–651.
20. Oxman AD, Guyatt GH. Validation of an index of the quality of review articles. *Journal of Clinical Epidemiology* 1991; 44:1271–1278.

21. Higgins K, Cooper-Stanbury M, Williams P. *Statistics on Drug Use in Australia 1998*. Drug Statistics Series AIHW Catalogue No. PHE 16. Canberra: Australian Institute of Health and Welfare, 2000.
22. Australian Institute of Health and Welfare. *2001 National Drug Strategy Household Survey. First Results*. Canberra: Australian Institute of Health and Welfare, May 2002.
23. Kabesch M, von Mutius E. Adverse health effects of environmental tobacco smoke exposure in childhood. *ACI International* 2000; 12:146–152.
24. Weitzman M, Byrd RS, Aligne A, Moss M. The effects of tobacco exposure on children's behavioral and cognitive functioning: implications for clinical and public health policy and future research. *Neurotoxicology and Teratology* 2002; 24:397–406.
25. Kramer MS. Intrauterine growth and gestational duration determinants. *Pediatrics* 1987; 80:502–511.
26. Kleinman JC, Madans JH. The effects of maternal smoking, physical stature and educational-attainment on the incident of low birthweight. *American Journal of Epidemiology* 1985; 121:843–855.
27. MacArthur C, Knox EG. Smoking in pregnancy: effects of stopping at different stages. *British Journal of Obstetrics and Gynaecology* 1988; 95:551–555.
28. MacMahon B, Alpert M, Salber EJ. Infant weight and prenatal smoking habits. *American Journal of Epidemiology* 1965; 82:247–261.
29. Lumley J, Oliver S, Waters E. Smoking cessation programs implemented during pregnancy. In *The Cochrane Library*. Oxford: Update Software, 2001.
30. Kline J, Stein M, Hutzler M. Cigarettes, alcohol and marijuana. Varying associations with birthweight. *International Journal of Epidemiology* 1987; 16:44–51.
31. Chang G, Wilkins-Haug L, Berman S, Goetz MA. Brief intervention for alcohol use in pregnancy: a randomized trial. *Addiction* 1999; 94(10):1499–1508.
32. Dunn HG, McBurney AK, Ingram S, Hunter CM. Maternal cigarette smoking during pregnancy and the child's subsequent development: physical growth to the age of six and a half years. *Canadian Journal of Public Health* 1976; 76:499–505.
33. Barrow FC, Huttly SRA, Victoria CG, Kirkwood B, Vaughan JP. Comparison of the causes and consequences of prematurity and intrauterine growth retardation: A longitudinal study in southern Brazil. *Pediatrics* 1992; 90:238–244.
34. Breslau N, Chilcoat HD. Psychiatric sequelae of low birthweight at 11 years of age. *Biological Psychiatry* 2000; 47:1005–1011.
35. Pharoah POD, Stevenson CJ, Cooke RWI, Stevenson RC. Prevalence of behavior disorders in low birthweight infants. *Archives of Disease in Childhood* 1994; 70:271–274.
36. Breslau N, Chilcoat HD, Johnson EO, Andreski VC, Lucia VC. Neurologic soft signs and low birthweight: their association and neuropsychiatric implications. *Biological Psychiatry* 2000; 47:71–79.
37. Johnson EO, Breslau N. Increased risk of learning disability in low birthweight boys at age 11 years. *Biological Psychiatry* 2000; 47:490–500.
38. Olds D. Tobacco exposure and impaired development: a review of the evidence. *Mental Retardation and Developmental Disabilities Research Reviews* 1997; 3:257–269.
39. Dunn HG, McBurney AK, Ingram S, Hunter CM. Maternal cigarette smoking during pregnancy and the child's subsequent development:II. Neurological and intellectual maturation to the age of 6 1/2 years. *Canadian Journal of Public Health* 1977; 68:43–50.
40. Picone TA, Allen LH, Olsen PN, Ferris ME. Pregnancy outcome in North American women:II. Effects of diet, cigarette smoking, stress and weight gain on placentas and on neonatal physical and behavioral characteristics. *American Journal of Clinical Nutrition* 1982; 36:1214–1224.
41. Mattson S, Calarco KE, Chambers CD, Lyons Jones K. Interaction of maternal smoking and other in-pregnancy exposures: analytic consideration. *Neurotoxicology and Teratology* 2002; 24:367.
42. National Health and Medical Research Council. *Australian Alcohol Guidelines: Health Risks*

- and Benefits. Canberra: NHMRC, October 2001.
43. Claren SK, Smith DW. The fetal alcohol syndrome. *New England Journal of Medicine* 1978; 298:1063–1067.
 44. Habbick BF, Nanson JL, Snyder RE, Casey RE. Mortality in foetal alcohol syndrome. *Canadian Journal of Public Health* 1997; 88(3):181–183.
 45. Aronson M, Kyllerman M, Sabel KG, Sandin B, Olegard R. Children of alcoholic mothers: Developmental, perceptual, and behavioral characteristics as compared to matched controls. *Acta Paediatrica Scandinavica* 1985; 74:27–35.
 46. Coles CD, Smith IE, Lancaster JS, Falek A. Persistence over the first months of neurobehavioral differences in infants exposed to alcohol prenatally. *Infant Behavior and Development* 1987; 10:23–37.
 47. Gusella J, Fried P. Effects of maternal social drinking and smoking on offspring at 13 months. *Neurobehavioral Toxicology and Teratology* 1984; 6:13–17.
 48. O'Connor MJ, Brill N, Sigman M. Alcohol use in elderly primips: Relation to infant development. *Pediatrics* 1986; 78:444–450.
 49. Streissguth AP, Aase JM, Clarren SK, Randels SP, LaDue RA, Smith DF. Fetal alcohol syndrome in adolescents and adults. *Journal of the American Medical Association* 1991; 265:1961–1967.
 50. Zuckerman B, Frank DA. Prenatal cocaine and marijuana exposure: Research and clinical implications. In Zagon IS, Slotkin TA (eds). Boston: Academic Press, 1992;125–154.
 51. Harclerode J. *The Effect of Marijuana on Reproduction and Development*. NIDA Research Monograph No. 31: National Institute of Drug Abuse, 1980.
 52. Fried PA. Marijuana use by pregnant women and effects on offspring: An update. *Neurobehavioral Toxicology and Teratology* 1982; 4:451–454.
 53. Zuckerman B, Frank DA, Hingson R, Amaro H, Levenson S, Kayne H. Effects of maternal marijuana and cocaine use on fetal growth. *New England Journal of Medicine* 1989; 320:762–768.
 54. Hingson R, Alpert JJ, Day N, Dooling E, Kayne H, Morelock S, et al. Effects of maternal drinking and marijuana use on fetal growth and development. *Pediatrics* 1989; 70:539–542.
 55. O'Connell CM, Fried PA. An investigation of prenatal cannabis exposure and minor physical anomalies in a low risk population. *Neurobehavioral Toxicology and Teratology* 1984; 6:345–350.
 56. Fried PA. Marijuana use by pregnant women: Neurobehavioral effects in neonates. *Drug and Alcohol Dependence* 1980; 6:451–454.
 57. Fried PA, Makin JE. Neonatal behavior correlates of prenatal exposure to marijuana, cigarettes, and alcohol in a low-risk population. *Neurotoxicology and Teratology* 1987; 9:1–7.
 58. Levy M, Koren G. Clinical toxicology of the neonate. *Seminars in Perinatology* 1992; 16:63–75.
 59. Scher MS, Richardson GA, Coble PA, Day NL, Stoffer DS. The effects of prenatal alcohol and marijuana exposure: Disturbances in neonatal sleep cycling and arousal. *Pediatric Research* 1988; 24:101–105.
 60. Day NL, Richardson GA. Prenatal marijuana use: Epidemiology, methodologic issues, and infant outcome. *Clinics in Perinatology* 1991; 18:77.
 61. Scragg RK, Mitchell EA, Ford RP, Thompson JM, Taylor BJ, Stewart AW. Maternal cannabis use in the sudden death syndrome. *Acta Paediatrica* 2001; 90(1):57–60.
 62. Lim G, Lovegrove M. The effects of marijuana use on pregnancy, the fetus and the child. In; 1994.
 63. Mayes LC, Granger RH, Bornstein MH, Zuckerman B. The problem of prenatal cocaine exposure. A rush to judgement. *Journal of the American Medical Association* 1992; 267(3):406–408.
 64. Mayes LC, Granger RH. Teratologic and developmental effects of prenatal drug exposure: Alcohol, heroin, marijuana, and cocaine. In Lewis M (ed) *A Comprehensive Textbook of Child and Adolescent Psychiatry*. Philadelphia, PA: Williams and Wilkins, 1995;374–382.

65. Mayes LC, Fahy T. Prenatal drug exposure and cognitive development. In Sternberg RJ, Grigorenko EL (eds) *Environmental Effects on Cognitive Abilities*: Lawrence Erlbaum Associates, 2001.
66. Chao CR. Cardiovascular effects of cocaine during pregnancy. *Seminars in Perinatology* 1996; 20(2):107–114.
67. Singer I, Farkas K, Kliegman R. Childhood medical and behavioral consequences of maternal cocaine use. *Journal of Pediatric Psychology* 1992; 17(4):389–406.
68. Neuspil DR. The problem of confounding in research on prenatal cocaine effects on behavior and development. In Lewis M, Bendersky M (eds) *Mothers, Babies and Cocaine: The Role of Toxins in Development*. New York: Lawrence Erlbaum Associates, 1995;95–109.
69. Desmond MM, Wilson GS. Neonatal abstinence syndrome: Recognition and diagnosis. *Addictive Diseases* 1975; 2:113–121.
70. Finnegan LP. Clinical effect of pharmacologic agents on pregnancy, the fetus, and the neonate. *Annals of the New York Academy of Sciences* 1976; 281:74–89.
71. Hans SL. Maternal opioid use and child development. In Zagon IS, Slotkin TA (eds) *Maternal Substance Abuse and The Developing Nervous System*. San Diego, CA: Academic Press, 1992;177–214.
72. Kaltenbach K, Finnegan LP. Perinatal and developmental outcome of infants exposed to methadone in-utero. *Neurotoxicology and Teratology* 1987; 9:311–313.
73. Zagon IS, McLaughlin P. An overview of the neurobehavioral sequelae of perinatal opioid exposure. *Neurobehavioral Teratology* 1984:194–233.
74. Rosen TS, Johnson HL. Drug-addicted mothers, their infants, and SIDS. *Annals of the New York Academy of Sciences* 1988; 533:533–595.
75. Jeremy RJ, Hans SL. Behavior of neonates exposed in utero to methadone as assessed on the Brazelton scale. *Infant Behavior and Development* 1985; 8:323–336.
76. Hans SL. Developmental consequences of prenatal exposure to methadone. *Annals of New York Academy of Sciences* 1989; 562:195–207.
77. Hans SL, Marcus J. Motor and attentional behavior in infants of methadone maintained women. *National Institute of Drug Abuse Research Monogram* 1983; 43:287–293.
78. Hans SL, Marcus J, Jeremy RJ. Neurobehavioral development of children exposed in utero to opioid drugs. In Yanai J (ed) *Neurobehavioral Teratology*. New York: Elsevier, 1984;249–273.
79. Bauman P, Levine SA. The development of children of drug addicts. *International Journal of Addiction* 1986; 21:849–863.
80. Sowder BJ, Burt MR. *Children of Heroin Addicts: An Assessment of Health, Learning, Behavioral, and Adjustment Problems*. New York: Praeger; 1980.
81. Wilson GS. Clinical studies of infants and children exposed prenatally to heroin. *Annals of the New York Academy of Sciences* 1989; 562:183–194.
82. Perez-Reyes M, Wall ME. Presence of 89-tetrahydrocannabinol in human milk. *New England Journal of Medicine* 1982; 307:819–820.
83. Astley SJ, Little RE. Maternal marijuana use during lactation and infant development at one year. *Neurotoxicology and Teratology* 1990; 12:161–168.
84. Mejta C, Lavin R. Facilitating healthy parenting among mothers with substance abuse or dependence problems: Some considerations. *Alcoholism Treatment Quarterly* 1996; 14(1):33–46.
85. CASA. *No Safe Haven: Children of Substance Abusing Parents*. New York: National Center on Addiction and Substance Abuse at Columbia University, 1998.
86. Kelleher K. Alcohol and drug disorders among physically abusive and neglectful parents in a community-based sample. *American Journal of Public Health* 1994; 84(10):1586–1590.
87. Angus G, Hall G. *Child Abuse and Neglect Australia 1994–1995*. Child Welfare Series No. 16. Canberra: Australian Institute of Health and Welfare, 1996.
88. Hans SL, Bernstein VJ, Henson LG. The role of psychopathology in the parenting of drug-dependent women. *Development and Psychopathology* 1999; 11:957–977.

89. Farkas K, Parran TV. Treatment of cocaine addiction during pregnancy. *Clinical Perinatology* 1993; 20:29–45.
90. Finkelstein N. Treatment of programming for alcohol and drug-dependent women. *International Journal of Addiction* 1993; 28:1275–1309.
91. Finnegan LP, Oehlberg SM, Regan DO, Rudrauff ME. Evaluation of parenting, depression and violence profiles in methadone maintained women. *Child Abuse and Neglect* 1981; 5:267–273.
92. Baker B, Heller T. Preschool children with externalizing behaviors: experience of fathers and mothers. *Journal of Abnormal Child Psychology* 1996; 24:513–532.
93. Bellinger DC. Interpreting the literature on lead and child development: The neglected role of the “experimental system”. *Neurotoxicology and Teratology* 1995; 17:201–212.
94. Hans SL. Studies of prenatal exposure to drugs. Focusing on parental care of children. *Neurotoxicology and Teratology* 2002; 24:329–337.
95. United States Environmental Protection Agency. *Respiratory Health Effects of Passive Smoking: Lung Cancer and Other Disorders*. Report No. EPA/600/6-90/006F. Washington (DC): United States Environmental Protection Agency, Office of Health and Environmental Assessment, Office of Research and Development, December 1992.
96. Dybing E, Sanner T. Passive smoking, sudden infant death syndrome (SIDS) and childhood infections. *Human and Experimental Toxicology* 1999; 18(4):202–205.
97. Schenker MB, Samur JM, Speizer FE. Risk factors for childhood respiratory disease: the effect of host factors and home environmental exposures. *American Review of Respiratory Disease* 1983; 128:1038–1043.
98. Strachan D, Jarvis MJ, Feyerabend C. The relationship of salivary cotinine to respiratory symptoms, spirometry and exercise induced bronchospasm in seven-year old children. *American Review of Respiratory Disease* 1990; 142:147–151.
99. Rylander E, Pershagen G, Eriksson M, Bermann G. Parental smoking, urinary cotinine and wheezing bronchitis in children. *Epidemiology* 1995; 6:289–293.
100. Nafstad P, Jaakkola JJK, Hagen JA. Breastfeeding, maternal smoking and lower respiratory tract infections. *European Respiratory Journal* 1996; 9:2623–2629.
101. Strachan D, Jarvis MJ, Feyerabend C. Passive smoking, salivary cotinine concentrations and middle ear effusion in 7 year old children. *British Medical Journal* 1989; 298:1549–1552.
102. Klonoff-Cohen HS, Edelstein SL, Lefkowitz ES, Srinivasan AP, Kaegi D, Chang JC, et al. The effect of passive smoking and tobacco exposure through breast milk on sudden infant death syndrome. *Journal of the American Medical Association* 1995; 273:795–798.
103. Hiley CMH, Morley CJ. Risk factors for sudden infant death syndrome: further change in 1992-93. *British Medical Journal* 1996; 312:1397–1398.
104. Tager IB, Weiss ST, Munoz A, et-al. Longitudinal study of the effects of maternal smoking on pulmonary function in children. *New England Journal of Medicine* 1983; 309:699–703.
105. Rona RJ, Chinn S, Du Ve Florey C. Exposure to cigarette smoking and children’s growth. *International Journal of Epidemiology* 1985; 14:402–409.
106. Woodward A, Douglas RM, Graham NMH, Miles H. Acute respiratory illness in Adelaide children: breastfeeding modifies the effect of passive smoking. *Journal of Epidemiology and Community Health* 1990; 44:224–230.
107. Maran AGD, Wilson JA. Glue ear and speech development. *British Medical Journal* 1986; 293:713–714.
108. Samet JM, Tager I, Speizer F. The relation between respiratory illness in childhood and chronic airflow obstruction in adulthood. *American Review of Respiratory Disease* 1983; 127:523.
109. Shaheen SO, Barker JP, Shiell AW, et-al. The relationship between pneumonia in early childhood and impaired lung function in late adult life. *American Journal of Respiratory Critical Care Medicine* 1994; 149:616–619.

110. Kandel DB, Wu P, Davis M. Maternal smoking during pregnancy and smoking by adolescent daughters. *American Journal of Public Health* 1994; 84:1407–1413.
111. Chassin L, Presson CC, Todd M, Sherman SJ, Rose J. Maternal socialization of adolescent smoking: the intergenerational transmission of parenting and smoking. *Developmental Psychology* 1998; 34:1269–1273.
112. Jackson C, Henriksen L, Dickinson D, Messer L, Robertson S. A longitudinal study predicting patterns of cigarette smoking in late childhood. *Health Education and Behaviour* 1998; 24:436–447.
113. Doll R. Effect of environmental tobacco smoke on adults. In Stockwell T (ed) *Drug Trials and Tribulations: Lessons for Australian Drug Policy. Proceedings of an International Symposium*. Perth: National Centre for Research into the Prevention of Drug Abuse, 1998; 1–14.
114. National Health and Medical Research Council. *The Health Effects of Passive Smoking*. Canberra: National Health and Medical Research Council, 1997.
115. White V. *Australian Secondary Students' Use of Over-the-counter and Illicit Substances in 1999*. National Drug Strategy Monograph Series No. 46. Canberra: Commonwealth Department of Health and Aged Care, 2001.
116. White VM, Hill DJ, Letcher TR. Alcohol use among Australian secondary students in 1996. *Drug and Alcohol Review* 2000; 19(4):371–379.
117. Johnson EO, Schutz CG, Anthony JC, Ensminger ME. Inhalants to heroin: a prospective analysis from adolescence to adulthood. *Drug and Alcohol Dependence* 1995; 40:159–164.
118. Costello EJ, Erkanli A, Federman E, Angold A. Development of psychiatric comorbidity with substance abuse in adolescents: effects of timing and sex. *Journal of Clinical Child Psychology* 1999; 28(3):298–311.
119. Patton GC, Carlin JB, Coffey C, Wolfe R, Hibbert M, Bowes G. The course of early smoking: a population based cohort study over three years. *Addiction* 1998; 93:1251–1260.
120. Jackson KM, Sher KJ, Wood PK. Trajectories of concurrent substance use disorders: a developmental, typological approach to comorbidity. *Alcoholism: Clinical and Experimental Research* 2000; 24(6):902–913.
121. Kandel DB, Yamaguchi K, Chen K. Stages of progression in drug involvement from adolescence to adulthood: further evidence for the gateway theory. *Journal of Studies on Alcohol* 1992; (September):447–457.
122. McGee R, Williams S, Poulton R, Moffitt T. A longitudinal study of cannabis use and mental health from adolescence to early adulthood. *Addiction* 2000; 95(4):491–503.
123. Coffey C, Lynskey M, Wolfe R, Patton G. Initiation and progression of cannabis use in a population-based Australian adolescent longitudinal study. *Addiction* 2000; 95(11):1679–1690.
124. Newcomb MD, Felix-Ortiz M. Multiple protective and risk factors for drug use and abuse: cross-sectional and prospective findings. *Journal of Personality and Social Psychology* 1992; 63(2):280–296.
125. Fergusson DM, Lynskey MT, Horwood LJ. Childhood exposure to alcohol and adolescent drinking patterns. *Addiction* 1994; 89:1007–1016.
126. Miller-Johnson S, Lochman JE, Coie JD, Terry R, Hyman C. Comorbidity of conduct and depressive problems at sixth grade: substance use outcomes across adolescence. *Journal of Abnormal Child Psychology* 1998; 26(3):221–232.
127. Guy SM, Smith GM, Bentler PM. Adolescent socialization and use of licit and illicit substances: impact on adult health. *Psychology and Health* 1993; 8:463–487.
128. Casswell S, Zhang J-F. Access to alcohol from licensed premises during adolescence: a longitudinal study. *Addiction* 1997; 92(6):737–745.
129. Guo J, Hawkins JD, Hill KG, Abbott RD. Childhood and adolescent predictors of alcohol abuse and dependence in young adulthood. *Journal of Studies on Alcohol* 2001; 62:754–762.
130. Hill KG, White HR, Chung I, Hawkins JD, Catalano RF. Early adult outcomes of adolescent binge drinking: person and variable centered analyses of binge drinking trajectories. *Alcoholism: Clinical and Experimental Research* 2000; 23(6):892–901.

131. Federman EB, Costello EJ, Angold A, Farmer EM, Erkanli A. Development of substance use and psychiatric comorbidity in an epidemiologic study of white and American Indian young adolescents the Great Smoky Mountains Study. *Drug and Alcohol Dependence* 1997; 44(2-3):69-78.
132. Krueger RF. Personality traits in late adolescence predict mental disorders in early adulthood: a prospective-epidemiological study. *Journal of Personality* 1999; 67(1):39-65.
133. Newcomb MD, Bentler PM. Impact of adolescent drug use and social support on problems of young adults: a longitudinal study. *Journal of Abnormal Psychology* 1988; 97(1):64-75.
134. Williams P. *Alcohol-related social disorder and rural youth: Part 2 - Perpetrators*. Trends and Issues in Crime and Criminal Justice Series No. 149. Canberra: Australian Institute of Criminology, March 2000.
135. Brook JS, Whiteman M, Finch SJ, Cohen P. Young adult drug use and delinquency: childhood antecedents and adolescent mediators. *Journal of the American Academy of Child & Adolescent Psychiatry* 1996; 35(12):1584-1592.
136. Brook JS, Whiteman M, Finch S, Cohen P. Mutual attachment, personality, and drug use: pathways from childhood to young adulthood. *Genetic, Social and General Psychology* 1998; 124(4):492.
137. Stacy AW, Newcomb MD. Adolescent drug use and adult drug problems in women: direct, interactive and mediational effects. *Experimental and Clinical Psychopharmacology* 1999; 7(2):160-173.
138. Brook JS, Cohen P, Brook DW. Longitudinal study of co-occurring psychiatric disorders and substance use. *Journal of the American Academy of Child and Adolescent Psychiatry* 1998; 37(3):322-330.
139. Bewley BR, Bland JM. Smoking and respiratory symptoms in two groups of school children. *Preventive Medicine* 1976; 5:63-69.
140. Adams L, Lonsdale D, Robinson M, Bawbone R, Guz A. Respiratory impairment induced by smoking in children in secondary schools. *British Medical Journal* 1984; 288:891-895.
141. U.S. Department of Health and Human Services. *The Health Consequences of Smoking: Chronic Obstructive Lung Disease: A Report of the Surgeon General*. Report No. PHS 84-50204. United States: Public Health Service. Office on Smoking and Health, 1984.
142. Royal College of Physicians of London. *Smoking and the Young*. London: Royal College of Physicians, 1992.
143. Townsend J, Wikes H, Haines A, Jarvis M. Adolescent smokers seen in general practice: health, lifestyle, physical measurements, and response to antismoking advice. *British Medical Journal* 1991; 303:947-950.
144. Lerner JV, Vicary JR. Difficult temperament and drug use: analyses from the New York longitudinal study. *Journal of Drug Education* 1984; 14(1):1-8.
145. Newcomb MD, McGee L. Influence of sensation seeking on general deviance and specific problem behaviors from adolescence to young adulthood. *Journal of Personality and Social Psychology* 1991; 61(4):614-628.
146. Commonwealth Department of Health and Aged Care. *National Tobacco Strategy 1999 to 2002-03. A Framework for Action*. Canberra: Commonwealth Department of Health and Aged Care, June 1999.
147. Chassin L, Pitts SC, DeLucia C, Todd M. A longitudinal study of children of alcoholics: predicting young adult substance use disorders, anxiety, and depression. *Journal of Abnormal Psychology* 1999; 108(1):106-119.
148. Fergusson DM, Lynskey MT, Horwood LJ. Alcohol misuse and juvenile offending in adolescence. *Addiction* 1996; 91(4):483-494.
149. Andrews JA, Duncan SC. Examining the reciprocal relation between academic motivation and substance use: effects of family relationships, self-esteem, and general deviance. *Journal of Behavioral Medicine* 1997; 20(6):523-549.
150. Pedersen W, Skrondal A. Alcohol and sexual victimization: a longitudinal study of Norwegian girls. *Addiction* 1996; 91(4):565-581.
151. Heale P, Stockwell T, Dietze P, Chikritzhs T, Catalano P. *Patterns of Alcohol Consumption in Australia, 1998*. National Alcohol Indicators

- Project Bulletin No. 3. Perth: National Drug Research Institute, Curtin University of Technology, 2000.
152. Lemmens P. Relationship of alcohol consumption and alcohol problems at the population level. In Heather N, Peters TJ, Stockwell T (eds) *International Handbook of Alcohol Dependence and Problems*. Chichester: John Wiley and Sons, 2001; 395–412.
 153. White V. *Australian Secondary Students' Use of Alcohol in 1999*. National Drug Strategy Monograph No. 45. Canberra: Commonwealth of Australia, 2001.
 154. Moon L, Meyer P, Grau J. *Australia's Young People: Their Health and Wellbeing, the first report on the health of young people aged 12-24 years*. Catalogue No. PHE 19. Canberra: Australian Institute of Health and Welfare, 1999.
 155. McBride N, Midford R, Farringdon F, Phillips M. Early results from a school alcohol harm minimization study: the School Health and Alcohol Harm Reduction Project. *Addiction* 2000; 95(7):1021–1042.
 156. Fergusson DM, Horwood LJ. Early onset cannabis use and psychosocial adjustment in young adults. *Addiction* 1997; 92(3):279–296.
 157. Fergusson DM, Horwood LJ, Swain-Campbell N. Cannabis dependence and psychotic symptoms in young people. *Psychological Medicine* 2003; 33(1):15–21.
 158. Fergusson DM, Horwood LJ, Swain-Campbell N. Cannabis use and psychosocial adjustment in adolescence and young adulthood. *Addiction* 2002; 97(9):1123–1135.
 159. Fergusson DM, Lynskey MT, Horwood LJ. The short-term consequences of early onset cannabis use. *Journal of Abnormal Child Psychology* 1996; 24(4):499–512.
 160. Bray JW, Zarkin GA, Ringwalt C, Junfeng Q. The relationship between marijuana initiation and dropping out of high school. *Health Economics* 2000; 9:9–18.
 161. Lynskey M, Hall W. The effects of adolescent cannabis use on educational attainment: a review. *Addiction* 2000; 95(11):1621–1630.
 162. Kandel DB, Simcha-Fagan O, Davies M. Risk factors for delinquency and illicit drug use from adolescence to young adulthood. *Journal of Drug Issues* 1986; 16(1):67–90.
 163. Brook JS, Whiteman M, Cohen P, Shapiro J, Balka E. Longitudinally predicting late adolescent and young adult drug use: childhood and adolescent precursors. *Journal of the American Academy of Child & Adolescent Psychiatry* 1995; 34(9):1230–1238.
 164. Bachman JG, O'Malley PM, Johnston LD. Drug use among young adults: the impacts of role status and social environment. *Journal of Personality and Social Psychology* 1984; 47(3):629–645.
 165. Australian Crime Commission. *Australian Illicit Drug Report 2001-02*. Canberra: Commonwealth of Australia, 2003.
 166. Darke S, Ross J, Hando, J, Hall W, Degenhardt L. *Illicit Drug Use in Australia: Epidemiology, Use Patterns and Associated Harm*. National Drug Strategy Monograph Series No. 43. Canberra: Commonwealth Department of Health and Aged Care, 2000.
 167. Ridolfo B, Stevenson C. *The Quantification of Drug-caused Mortality and Morbidity in Australia, 1998*. Cat. No. PHE 29. Canberra: Australian Institute of Health and Welfare, 2001.
 168. Australian Bureau of Criminal Intelligence. *Australian Illicit Drug Report 2000-01*. Canberra: Commonwealth of Australia, 2002.
 169. Kaye S, Darke S, Topp L. *An Examination of Cocaine Dependence Among Injecting and Non-Injecting Drug Users in Sydney*. Technical Report No. 116. Sydney: National Drug and Alcohol Research Centre, 2001.
 170. Kaye S, Darke S, McKetin R. *The Prevalence, Patterns and Harms of Cocaine Use Among Injecting and Non-Injecting Drug Users in Sydney*. Technical Report No. 99. Sydney: National Drug and Alcohol Research Centre, 2000.
 171. Australian Bureau of Statistics. 1998: *Causes of Death*. Canberra: Australian Bureau of Statistics, 1999.
 172. Hall W, Degenhardt L, Lynskey M. *Trends in Opioid Overdose and Suicide Mortality in Young Adults in Australia 1964-1997*. Technical Report No. 67. Sydney: National Drug and Alcohol Research Centre, 1999.
 173. Lenton S, Humeniuk R, Heale P, Christie P. Infringement versus conviction: The social impact of a minor cannabis offence in South

- Australia and Western Australia. *Drug and Alcohol Review* 2000; 19:257–264.
174. Saggers S, Gray D. *Dealing with Alcohol: Indigenous Usage in Australia, New Zealand and Canada*. Melbourne: Cambridge University Press; 1998.
 175. McAllister I, Makkai T. The prevalence and characteristics of injecting drug users in Australia. *Drug and Alcohol Review* 2001; 20(1):29–36.
 176. Manski CF, Pepper JV, Petrie CV. *Informing America's Policy on Illegal Drugs: What We Don't Know Keeps Hurting Us*. Washington, DC: National Academy Press, 2001.
 177. Hillman SD, Silburn RS, Green A, Zubrick S. *Youth Suicide in Western Australia Involving Cannabis and Other Drugs*: Western Australian Drug Abuse Strategy Office, 2000.
 178. Stockwell T, Bolderston H. Alcohol and phobias. *British Journal of Addiction* 1987; 82:971–979.
 179. Teeson M. Comorbidity in mental health and substance use: causes, prevention and treatment. Paper presented at National Workshop on Comorbidity. Canberra, 6–7 March 2000.
 180. Centers for Disease Control and Prevention. National Tobacco Information Online System (NATIONS), 2001. Viewed July 19 2002, <<http://apps.nccd.cdc.gov/nations/>>.
 181. Fitzsimmons G, Cooper-Stanbury M. 1998 National Drug Strategy Household Survey; State and Territory Results. Drug Statistics Series No. 5. Canberra: Australian Institute of Health and Welfare, 2000.
 182. Australian Customs Service. *Australian Customs Service Annual Report 2001-02*. Canberra: Commonwealth of Australia, 2002.
 183. Ryder D, Salmon A, Walker N. *Drug Use and Drug-related Harm: A Delicate Balance*. Melbourne: IP Communications; 2001.
 184. Miller M, Draper G. *Statistics on Drug Use in Australia 2000*. Drug Statistics Series No. 8. AIHW Cat. No. PHE 30. Canberra: Australian Institute of Health and Welfare, 2001.
 185. Peto R, Darby S, Deo H, Silcocks P, Whitley E, Doll R. Smoking, smoking cessation, and lung cancer in the UK since 1950: combination of national statistics with two case-control studies. *British Medical Journal* 2000; 321:323–329.
 186. Stockwell T, Gruenewald P. Controls on the physical availability of alcohol. In Heather N, Peters TJ, Stockwell T (eds) *International Handbook of Alcohol Dependence and Problems*. Chichester: John Wiley and Sons, 2001;699–720.
 187. Stockwell TR. *Alcohol misuse and violence: an evaluation of the appropriateness and efficacy of liquor licensing laws across Australia*, report No. 5. Canberra: Australian Government Publishing Service; 1995.
 188. Stockwell T, Crosbie D. Supply and demand for alcohol in Australia: Relationships between industry structures, regulation and the marketplace. *International Journal of Drug Policy* 2001; 12:139–152.
 189. Catalano P, Chikritzhs T, Stockwell T, Webb M. *Trends in Per Capita Alcohol Consumption in Australia, 1990/91-1998/99*. Monograph No. 4. Perth, Western Australia: National Drug Research Institute, Curtin University of Technology; 2001.
 190. Distilled Spirits Industry Council of Australia Inc. *DSICA Submission to the Senate Economics Legislation Committee*. Melbourne, Australia: DSICA, 2002.
 191. Stockwell T, Heale P, Dietze P, Chikritzhs T, Catalano P. *Patterns of Alcohol Consumption in Australia*. National Alcohol Indicators Project Technical Report No. 3. Perth: National Drug Research Institute, Curtin University of Technology, 2001.
 192. *World Drink Trends. International Beverage Alcohol Consumption and Production Trends*. Oxfordshire: World Advertising Research Center; 2002.
 193. National Drug Research Institute. *Current Inquiry: Substance Abuse in Australian Communities*. Perth: National Drug Research Institute, Curtin University of Technology, 2000.
 194. Chikritzhs T, Jonas HA, Stockwell TR, Heale PF, Dietze PM. Mortality and life-years lost due to alcohol: a comparison of acute and chronic causes. *Medical Journal of Australia* 2001; 174:281–284.
 195. Chikritzhs T, Jonas H, Heale P, Stockwell T, Dietze P, Hanlin K, et al. *Alcohol-Caused Deaths and Hospitalisations in Australia, 1990-1997*.

- National Alcohol Indicators Project
Technical Report No. 1. Perth: National
Drug Research Institute, 2000.
196. Degenhardt L, Hall W. *The Association Between Psychosis and Problematic Drug Use Among Australian Adults: Findings from the National Survey of Mental Health and Well-Being*. Technical Report No. 93. Sydney: National Drug and Alcohol Research Centre, 2000.
 197. Gilman SE, Abraham HD. A longitudinal study of the order of onset of alcohol dependence and major depression. *Drug and Alcohol Dependence* 2001; 63:277–286.
 198. Greenfield TK. Individual risk of alcohol-related disease and problems. In Heather N, Peters TJ, Stockwell T (eds) *International Handbook of Alcohol Dependence and Problems*. Chichester: John Wiley and Sons, 2001;413–438.
 199. Chikritzhs T, Stockwell T, Jonas H, Stevenson C, Cooper-Stanbury M, Donath S, et al. Towards a standardised methodology for estimating alcohol-caused death, injury and illness in Australia. *Australian and New Zealand Journal of Public Health* 2002; 26(5):443–450.
 200. Australian Bureau of Criminal Intelligence. *Australian Illicit Drug Report 1999-2000*. Canberra: Australian Bureau of Criminal Intelligence, 2001.
 201. Topp L, Kaye S, Bruno R, Longo M, Williams P, O'Reilly B, et al. *Australian Drug Trends 2001: Findings of the Illicit Drug Reporting System (IDRS)*. Monograph No. 48. Sydney: National Drug and Alcohol Research Centre, 2002.
 202. Makkai T, McGregor K. *Drug Use Monitoring in Australia. 2001 Annual Report on Drug Use Among Police Detainees*. *Research and Public Policy Series* 2002; No. 41:1–73.
 203. World Health Organization. *Rational Use of Benzodiazepines*. Geneva: World Health Organization, 1996.
 204. Berbatis C, Lockwood A. *The Utilisation of Drugs to Treat Anxiety, Insomnia and Depression in Australia: Australian Statistics, Associated Morbidity and Mortality, Alternative Treatments and Recommendations for Improved Drug Use*. Perth: National Centre for Research into the Prevention of Drug Abuse, 1988.
 205. Dobbin M. *Flunitrazepam (Rohypnol, Hypnodorm)*. Melbourne: Victorian Department of Human Services, 1997.
 206. Goldberg L, MacKinnon DP, Elliot DL, Moe EL, Clarke G, Cheong J. The adolescents training and learning to avoid steroids program. *Archives of Pediatrics and Adolescent Medicine* 2000; 154:332–338.
 207. Maycock B, Beel A. Anabolic steroid abuse and violence. *Crime and Justice Bulletin*. NSW Bureau of Crime Statistics and Research, 1997. Viewed September 2001, <<http://www.attgendepnt.nsw.gov.au/boscar1.nsf/pages/index>>.
 208. Van de Ven P, Rawstorne P, Crawford J, Kippax S. *Facts and Figures. 2000 Male Out Survey*. Monograph No. 2. Sydney: National Centre in HIV Social Research, 2001.
 209. Yesalis CE, Bahrke MS. Anabolic-androgenic steroids. *Current issues*. *Sports Medicine* 1995; 19(5):326–340.
 210. Beel A, Maycock B, McLean N. Current perspectives on anabolic steroids. *Drug and Alcohol Review* 1998; 17:87–103.
 211. Delalande CL, Aitken CK, Mercuri P, Stanton KA. Risky practices among people who inject steroids. *Medical Journal of Australia* 1998; 169:62.
 212. Maycock B, Howat P. Factors contributing to anabolic androgenic steroid related violence. *Journal of Performance Enhancing Drugs* 1999; 2(3):4–15.
 213. Topp L, Darke S, Bruno R, Fry C, Hargreaves K, Humenuik R, et al. *Australian Drug Trends 2000: Findings from the Illicit Drug Reporting System (IDRS)* Monograph No. 47. Sydney: National Drug and Alcohol Research Centre, 2001.
 214. Swift W, Hall W, Teesson M. *Cannabis use disorders among Australian adults: Findings from the National Survey of Mental Health and Wellbeing*. Technical Report No. 78. Sydney: National Drug and Alcohol Research Centre, 1999.
 215. Lenton S, Heale P, Erickson P, Single E, Lang E, Hawks D. *The Regulation of Cannabis Possession, Use and Supply. A Discussion Document Prepared for the Drugs and Crime Prevention Committee of The Parliament of Victoria*. Monograph No. 3. Perth: National Drug Research Institute, 2000.
 216. Hall W. The public health significance of cannabis use in Australia. *Australian Journal of Public Health* 1995; 19(3):235–242.

217. Hall W, Solowij N. Adverse effects of cannabis. *Lancet* 1998; 352(9140):1611–1616.
218. Solowij N. *Cannabis and Cognitive Functioning*. United Kingdom: Cambridge University Press; 1998.
219. Hall W, Teesson M, Lynskey M, Degenhardt L. *The Prevalence in the Past Year of Substance Use and ICD-10 Substance Use Disorders in Australian Adults: Findings from the National Survey of Mental Health and Well-being*. Sydney: National Drug and Alcohol Research Centre, 1998.
220. World Health Organization. *Amphetamine-Type Stimulants: A report from the WHO Meeting on Amphetamines, MDMA and other Psychostimulants, Geneva, 12-15 November 1996*. Geneva: Division of Mental Health and Prevention of Substance Abuse, World Health Organization (WHO), 1997.
221. Makkai T, McGregor K. *Drug Use Monitoring in Australia: 2000 Annual Report on Drug Use Among Police Detainees*. Canberra: Australian Institute of Criminology, 2001.
222. Degenhardt L, Darke S, Dillon P. GHB use among Australians: characteristics, use patterns and associated harm. *Drug and Alcohol Dependence* 2002; 67:89–94.
223. Topp L. IDRS: Illicit Drug Reporting System April 2001. *Drug Trends Bulletin*. Sydney: National Drug and Alcohol Research Centre, 2001.
224. Curran HV. Is MDMA ('Ecstasy') neurotoxic in humans? An overview of evidence and of methodological problems in research. *Neuropsychobiology* 2000; 42:34–41.
225. Morgan MJ. Ecstasy (MDMA): A review of its possible persistent psychological effects. *Psychopharmacology* 2000; 15:230–248.
226. Dillon P. 10 years of ecstasy and other party drug use in Australia: what have we done and what is there left to do? 2000. Viewed 11 September 2001, <http://www.clubhealth.org.uk/pages/2000/p2_p4.htm>.
227. Turner JJD, Parrot AC. 'Is MDMA a human neurotoxin?': Diverse views from the discussants. *Neuropsychobiology* 2000; 42:42–48.
228. Darke S, Kaye S, Topp L. NSW Drug Trends 2001. *Findings from the Illicit Drug Reporting System (IDRS)*. Technical Report No. 125. Sydney: National Drug and Alcohol Research Centre, 2002.
229. Hall W, Lynskey M, Degenhardt L. *Heroin Use in Australia: Its Impact on Public Health and Public Order*. Monograph No. 42. Sydney: National Drug and Alcohol Research Centre, 1999.
230. Warner-Smith M, Lynskey M, Darke S, Hall W. *Heroin Overdose: Prevalence, Correlates, Consequences and Interventions*. Monograph No. 46. Sydney: National Drug and Alcohol Research Centre, 2000.
231. Degenhardt L. *Opioid Overdose Deaths in Australia*. Sydney: National Drug and Alcohol Research Centre, 2001.
232. Callaly T, Trauer T, Munro L, Whelan G. Prevalence of psychiatric disorder in a methadone maintenance population. *Australian and New Zealand Journal of Psychiatry* 2001; 35:601–605.
233. d'Abbs P, MacLean S. *Petrol Sniffing in Aboriginal Communities: A Review of Interventions*: Cooperative Research Centre for Aboriginal and Tropical Health, 2000.
234. Darke S, Zador D. Fatal heroin 'overdose': a review. *Addiction* 1996; 91(12):1765–1772.
235. Gerostamoulos J, Staikos V, Drummer OH. Heroin-related deaths in Victoria: a review of cases for 1997 and 1998. *Drug and Alcohol Dependence* 2000; 61:123–128.
236. Drug Policy Expert Committee. *Drugs: Meeting the Challenge*. Melbourne: Drug Policy Expert Committee, 2000.
237. Darke S, Kaye S, Ross J. Transitions between the injection of heroin and amphetamines. *Addiction* 1999; 94:1795–1804.
238. Makkai T. Patterns of recent drug use among a sample of Australian detainees. *Addiction* 2001; 96(12):1799–1808.
239. National Centre in HIV Epidemiology and Clinical Research. *Annual Surveillance Report. HIV/AIDS, Viral Hepatitis and Sexually Transmissible Infections in Australia*. Sydney: University of New South Wales, 2001.
240. Darke S, Topp L, Hall W. IDRS: Illicit Drug Reporting System April 2001. *Drug Trends Bulletin, Supplement*. Sydney: National Drug and Alcohol Research Centre, 2001.

241. Ross J, Cohen J, Darke S, Hando J, Hall J. *Transitions Between Routes of Administration and Correlates of Injecting Amongst Regular Amphetamine Users in Sydney*. Monograph No. 18. Sydney: National Drug and Alcohol Research Centre, 1994.
242. Carruthers S, Loxley W. Attitudes of novice heroin injectors towards non-injecting routes of administration to prevent the transmission of blood borne viruses. *International Journal of Drug Policy* 2002; 13:69–74.
243. National Centre in HIV Epidemiology and Clinical Research. *HIV/AIDS, Viral Hepatitis & Sexually Transmissible Infections in Australia. Annual Surveillance Report*. Sydney: National Centre in HIV Epidemiology and Clinical Research, 2001.
244. Darke S, Kay S, Ross J. Geographical injecting locations among injecting drug users in Sydney, Australia. *Addiction* 2001; 96:241–246.
245. Hulse GK, Basso MR, Wodak A. The injecting drug user. In Hulse GK, White J, Cape G (eds) *Management of Alcohol and Other Drug Problems*. Melbourne: Oxford University Press, 2003.
246. Department of Human Services Victoria. *Injecting Temazepam*. Department of Human Services, Victoria, 2001. Viewed 5 November 2001, <<http://www.drugs.vic.gov.au/temazepam/facts.htm>>.
247. Pearson D. Temazepam capsules - PBS Restrictions. In: Haines B, editor. Canberra: UPDATE; 2002.
248. Batey RG, Bollipo J. Hepatitis B. *Drug and Alcohol Review* 1996; 15:289–306.
249. Carruthers S, Loxley W, Phillips M, Bevan JS. The Australian Study of HIV and Injecting Drug Use. Part II: predicting exposure to hepatitis C and hepatitis B. *Drug and Alcohol Review* 1997; 16:215–220.
250. Australian National Council on AIDS Hepatitis C and Related Diseases Hepatitis C Sub-Committee. *Hepatitis C Virus Projections Working Group: Estimates and Projections of the Hepatitis C Virus Epidemic in Australia 2002*. Sydney: National Centre in HIV Epidemiology and Clinical Research, 2002.
251. Brown K, Crofts N. Health care costs of a continuing epidemic of hepatitis C virus infection among injecting drug users. *Australian and New Zealand Journal of Public Health* 1998; 22:384–388.
252. Standing Committee on Social Issues. *Hepatitis C: The Neglected Epidemic. Inquiry into Hepatitis C in New South Wales*. Report No. 16. Sydney: Parliament of New South Wales, 1998.
253. Burrows D, Bassett B. *Meeting the Needs of People in Australia Living with Hepatitis C: National Hepatitis C Councils Education Reference Group*; 1996.
254. Unwin E, Codde J. Trends and patterns of drug-caused mortality in Australia and Western Australia. *Australian and New Zealand Journal of Public Health* 1999; 23(4):352–357.
255. Corrao G, Bagnardi V, Zambon A, Arico S. Exploring dose-response relationship between alcohol consumption and the risk of several alcohol-related conditions: a meta analysis. *Addiction* 1999; 94:1551–1574.
256. Fingerhood M. Substance abuse in older people. *Journal of the American Geriatrics Society* 2000; 48(8):985–996.
257. Powell JE, McInnes E. Alcohol use among older hospital patients: Findings from an Australian study. *Drug and Alcohol Review* 1994; 13:5–12.
258. Schonfeld L, Dupree LW. Antecedents of drinking for early- and late-onset elderly alcohol abusers. *Journal of Studies on Alcohol* 1991; 52:587–592.
259. Olsen-Noll CG, Bosworth MF. Alcohol abuse in the elderly. *American Family Physician* 1989; 39(4):173–180.
260. Dunne FJ. Misuse of alcohol or drugs by elderly people: May need special management. *British Medical Journal* 1994; 308(6929):608–610.
261. Salazar Thomas V, Rockwood KJ. Alcohol abuse, cognitive impairment, and mortality among older people. *Journal of the American Geriatrics Society* 2001; 49(4):415–421.
262. Johnson I. Alcohol problems in old age: A review of recent epidemiological research. *International Journal of Geriatric Psychiatry* 2000; 15:575–581.

263. Australian Bureau of Statistics. *National Health Survey: Summary of Results*. Canberra: ABS, 1995.
264. Jorm AF, Grayson D, Creasey H, Waite L, Broe GA. Long-term benzodiazepine use by elderly people living in the community. *Australian and New Zealand Journal of Public Health* 2000; 24:7–10.
265. Ray WA, Griffin MR, Downey W. Benzodiazepines of long and short elimination half-life and the risk of hip fracture. *Journal of the American Medical Association* 1989; 262:3303–3307.
266. Wang PS, Bohn RL, Glynn RJ, Mogun H, Avorn J. Hazardous benzodiazepine regimens in the elderly: effects of half-life, dosage, and duration on risk of hip fracture. *American Journal of Psychiatry* 2001; 158:892–898.
267. Hemmelgarn B, Suissa S, Huang A, Boivin J-F, Pinard G. Benzodiazepines use and the risk of motor vehicle crash in the elderly. *Journal of the American Medical Association* 1997; 278:27–31.
268. Roughead EE, Gilbert AL, Primrose JG, Sansom LN. Drug-related hospital admissions: A review of Australian studies published 1988-1996. *Medical Journal of Australia* 1998; 168:405–408.
269. Commonwealth Department of Human Services and Health. *National Drug Strategy Household Survey: Urban Aboriginal and Torres Strait Islander Peoples Supplement* 1994. Canberra: Australian Government Publishing Service, 1996.
270. Kamien M. *The Dark People of Bourke: A Study of Planned Social Change*. Canberra: Australian Institute of Aboriginal Studies, 1978.
271. Stephenson J, Lenz P. *Tobacco Smoking by Aboriginal People in Wilcannia, Western NSW*. Health Report No. 3. Dubbo: Health Promotion Unit, NSW Department of Health, 1990.
272. Perkins J, Sanson-Fisher R, Blunden S, Lunnay D, Redman S, Hensley M. The prevalence of drug use in urban Aboriginal communities. *Addiction* 1994; 89:1319–1331.
273. Guest C, O’Dea K, Carlin JB, Larkins RG. Smoking in Aborigines and persons of European descent in southeastern Australia: prevalence and associations with food habits, body fat distribution and other cardiovascular risk factors. *Australian Journal of Public Health* 1992; 16(4):397–402.
274. Hoy WE, Norman RJ, Hayhurst BG, Pugsley DJ. A health profile of adults in a Northern Territory Aboriginal community, with an emphasis on preventable morbidities. *Australian and New Zealand Journal of Public Health* 1997; 21(2):121–126.
275. Watson C, Fleming J, Alexander K. *A Survey of Drug Use Patterns in Northern Territory Aboriginal Communities: 1986-1987*. Darwin: Northern Territory Department of Health and Community Services, 1988.
276. Forero R, Bauman A, Chen JXC, Flaherty B. Substance use and socio-demographic factors among Aboriginal and Torres Strait Islander school students in New South Wales. *Australian and New Zealand Journal of Public Health* 1999; 23:295–300.
277. Dunne MP, Yeo MA, Keane J, Elkins DB. Substance use by Indigenous and non-Indigenous primary school students. *Australian and New Zealand Journal of Public Health* 2000; 24(5):546–549.
278. Gray D, Morfitt B, Ryan K, Williams S. The use of tobacco, alcohol and other drugs by young Aboriginal people in Albany. *Australian and New Zealand Journal of Public Health* 1997; 21(1):71–76.
279. Gray D, Morfitt B, Williams S, Ryan K, Coyne L. *Drug Use and Related Issues Among Young Aboriginal People in Albany*. Perth: National Centre for Research into the Prevention of Drug Abuse, Albany Aboriginal Corporation, November 1996.
280. McLennan W, Madden R. *The Health and Welfare of Australia’s Aboriginal and Torres Strait Islander Peoples*. Catalogue No. 4704.0. Canberra: Australian Bureau of Statistics (ABS), 1999.
281. Kamien M. Aborigines and alcohol: intake, effects and social implications in a rural community in western New South Wales. *Medical Journal of Australia* 1975; 1:291–298.
282. Smith DI, Singh MN. *Survey of Aboriginal Alcohol Consumption and Related Problems at Wiluna, Western Australia*. Typescript. Perth: Western Australian Alcohol and Drug Authority, 1987.

283. Hunter E, Hall W, Spargo R. Patterns of alcohol consumption in the Kimberley Aboriginal population. *Medical Journal of Australia* 1992; 156:764–768.
284. Gray D, Chikritzhs T. Regional variation in alcohol consumption in the Northern Territory. *Australian and New Zealand Journal of Public Health* 2000; 24(1):35–38.
285. Gray D, Saggars S, Atkinson D, Carter M, Loxley W, Hayward D. *The Harm Reduction Needs of Aboriginal People Who Inject Drugs*. Perth: National Drug Research Institute, Curtin University of Technology, September 2001.
286. Larson A, Shannon C, Eldridge C. Indigenous Australians who inject drugs: results from a Brisbane study. *Drug and Alcohol Review* 1999; 18:53–62.
287. Shoobridge J, Vincent N, Allsop S, Biven A. *Using Rapid Assessment Methodology to Examine Injecting Drug Use in an Aboriginal Community*. Bedford Park: National Centre for Education and Training on Addiction, 1998.
288. Brady M. *Heavy Metal: The Social Meaning of Petrol Sniffing in Australia*. Canberra: Aboriginal Studies Press; 1992.
289. Freeman P. Petrol sniffing in Amata, South Australia. In *Nganampa Health Council Health Report 1985/86*. Alice Springs: Nganampa Health Council, 1986;88–97.
290. Burns C, d'Abbs P, Currie BJ. Patterns of petrol sniffing and other drug use in young men from an Australian Aboriginal community in Arnhem Land, Northern Territory. *Drug and Alcohol Review* 1995; 14(2):159–169.
291. Halfpenny N. *Update on the Prevalence of Petrol Sniffing on the Anangu Pitjantjatjara Lands*: Nganampa Health Council, 2000.
292. Royal Commission into Aboriginal Deaths in Custody, Johnston E, Commissioner. *Royal Commission into Aboriginal Deaths in Custody: National Report, 5 vol*. Canberra: Australian Government Publishing Service, 1991.
293. Langton M, Ah Mat L, Moss B, et al. Too much sorry business: the Submission of the Northern Territory Aboriginal Issues Unit. In Commissioner JE (ed) *Royal Commission into Aboriginal Deaths in Custody*. Canberra: Australian Government Publishing Service, 1991.
294. Pearson N. *Our Right to Take Responsibility*. Cairns, Qld: Noel Pearson and Associates, 2000.
295. Measey MA, d'Espaignet ET, Cunningham J. *Adult Morbidity and Mortality Due to Tobacco Smoking in the Northern Territory, 1986-1995*. Darwin: Territory Health Services, 1998.
296. Kunitz SJ, Santow G, Streatfield R, de Craen T. *The Health of Populations on North Queensland Aboriginal Communities: Change and Continuity*. Working Paper No. 30. Canberra: National Centre for Epidemiology and Population Health, Australia National University, 1992.
297. Peever M, Webster I. Deaths in an outback town in New South Wales. *Aboriginal Health Project Information Bulletin* 1984; 5:15–20.
298. Smith L, Thomson N, Gray A. *Aboriginal Mortality in New South Wales Country Regions, 1980-1981*. State Health Publication No. (IDS) 83-169. Sydney: New South Wales Department of Health, 1983.
299. Thomson N, Smith L. An analysis of Aboriginal mortality in NSW country regions, 1980-1981. *Medical Journal of Australia* 1985; 143(Suppl. 1):S49–S54.
300. Khalidi NA. Levels and trends of Aboriginal mortality in Central Australia. In Gray A (ed) *A Matter of Life and Death: Contemporary Aboriginal Mortality*. Canberra: Aboriginal Studies Press, 1990;85–94.
301. Devanesen D, Furber M, Hampton D, et al. *Health Indicators in the Northern Territory*. Darwin: Northern Territory Department of Health, 1986.
302. Dempsey KE, Condon CR. *Mortality in the Northern Territory 1979-97*. Darwin: Territory Health Services, 1999.
303. Hunter E. Changing Aboriginal mortality patterns in the Kimberley region of Western Australia, 1957-86: the impact of deaths from external causes. *Aboriginal Health Information Bulletin* 1989; 11:27–32.
304. Hicks DG. *Aboriginal Mortality Rates in Western Australia*. Perth: Health Department of Western Australia, 1985.
305. O'Neill D, ed. *Aboriginal Morbidity and Mortality in Western Australia*. Perth: Health Department of Western Australia; 1985.
306. Unwin E, Thomson N, Gracey M. *The Impact of Tobacco Smoking and Alcohol Consumption on*

- Aboriginal Mortality and Hospitalisation in Western Australia: 1983-1991. Perth: Health Department of Western Australia, 1994.
307. Brady M, Palmer K. *Alcohol in the Outback: A Study of Drinking in an Aboriginal Community*. NARU Monograph. Darwin: Australian National University, North Australia Research Unit, 1984.
308. Harris MF. Alcohol and physical disease in Bourke Aborigines. *Australian Drug and Alcohol Review* 1989; 8:79–82.
309. Brady M. *Where the Beer Truck Stopped: Drinking in a Northern Australian Town*. NARU Monograph. Darwin: Australian National University, North Australia Research Unit, 1988.
310. Flanagan D, Reece G. *Alcohol Related Problems Among the Alice Springs Hospital Inpatient Population*. Typescript. Sydney: University of Sydney, 1982.
311. Harris MF, Sutherland D, Cutter G, Ballangarry L. Alcohol admissions in a country town. *Australian Drug and Alcohol Review* 1987; 6:195–198.
312. Hunt H. Alcoholism among Aboriginal people. *Medical Journal of Australia* 1981; 1(Suppl.):1–3.
313. Patterson KM, Holman CDJ, English DR, Hulse GK, Unwin E. First-time hospital admissions with illicit drug problems in Indigenous and non-Indigenous Western Australians: an application of record linkage to public health surveillance. *Australian and New Zealand Journal of Public Health* 1999; 23(5):460–463.
314. Cawte JE. Parameters of kava used as a challenge to alcohol? *Australian and New Zealand Journal of Psychiatry* 1986; 20:70–76.
315. Mathews JD, Riley MD, Fejo L, Munoz E, Milns NR, Gardner ID, et al. Effects of the heavy usage of kava on physical health: Summary of a pilot survey in an Aboriginal community. *Medical Journal of Australia* 1998; 148(11):548–555.
316. Gray D, Saggars S. *Submission to the Inquiry by the Director of Liquor Licensing into Proposed Restrictions on the Sale of Packaged Liquor in Port Hedland and South Hedland*. Perth: National Drug Research Institute, Curtin University of Technology, 2002.
317. Task Force on Aboriginal Social Justice, Daube M, (Chairperson). *Report of the Task Force on Aboriginal Social Justice*. Perth: Government of Western Australia; 1994.
318. Harding R, Broadhurst R, Ferrante A, Loh N. *Aboriginal Contact With the Criminal Justice System and the Impact of the Royal Commission into Aboriginal Deaths in Custody*. Annandale, NSW: Hawkins Press, 1995.
319. Lyon P. *What Everybody Knows About Alice: A Report on the Impact of Alcohol Abuse on the Town of Alice Springs*. Alice Springs: Tangentyere Council, 1990.
320. Bolger A. *Aboriginal Women and Violence: A Report for the Criminology Research Council and the Northern Territory Commissioner of Police*. Darwin: Australian National University, North Australia Research Unit, 1990.
321. The Aboriginal and Torres Strait Islander Women's Task Force on Violence. *The Aboriginal and Torres Strait Islander Women's Task Force on Violence Report*. Brisbane: Department of Aboriginal and Torres Strait Islander Policy and Development, Queensland Government, 2000.
322. Gordon S, Hallahan K, Henry D. *Putting the Picture Together: Inquiry into Response by Government Agencies to Complaints of Family Violence and Child Abuse in Aboriginal Communities*. Perth: State Law Publisher, 2002.
323. Kahn M, Hunter E, Heather N, Tebbutt J. Australian Aborigines and alcohol: a review. *Drug and Alcohol Review* 1990; 10:351–366.
324. Edmunds M. *Doing Business: Socialisation, Social Relations and social Control in Aboriginal Societies*. Royal Commission into Aboriginal Deaths in Custody Discussion Paper No. 2. Canberra: Department of Prehistory and Anthropology, Australian National University Press and Australian Institute of Aboriginal and Torres Strait Islander Studies, 1990.
325. Hunter E. *Aboriginal Health and History*. Melbourne: Cambridge University Press; 1993.
326. Brady M. *Giving Away the Grog: Aboriginal Accounts of Drinking and Not Drinking*. Canberra: Commonwealth Department of Health and Family Services, 1995.

327. Dalton V, Edwards R. *Aboriginal Deaths in Prison 1980 to 1998: National Overview*. Trends and Issues in Crime and Criminal Justice. Canberra: Australian Institute of Criminology, 1999.
328. Reser J. Aboriginal mental health. In Reid J, Trompf P (eds) *The Health of Aboriginal Australia*. Sydney: Harcourt Brace Jovanovich, 1991.
329. Steenkamp M, Harrison J. *Suicide and Hospitalised Self-Harm in Australia*. Injury Research and Statistics Series. AIHW Catalogue No. INJCAT 30. Adelaide: Australian Institute of Health and Welfare, 2000.
330. Edwards RW, Madden R. *The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples 2001*. Canberra: Australian Bureau of Statistics, August 2001.
331. National Aboriginal Community Controlled Health Organisation. *NACCHO Submission to the House of Representatives Standing Committee on Family and Community Affairs Inquiry into Substance Abuse in Australian Communities*. Canberra: National Aboriginal Community Controlled Health Organisation, nd.
332. Swan P, Raphael B. *Ways Forward: National Aboriginal and Torres Strait Islander Mental Health Policy National Consultancy Report*. Canberra: Australian Government Publishing Service, 1995.
333. Department of Immigration and Multicultural Affairs. *Population Flows: Immigration Aspects*. Canberra: Department of Immigration and Multicultural Affairs, 2000.
334. Rissel C, McLellan L, Bauman A. Social factors associated with ethnic differences in alcohol and marijuana use by Vietnamese-, Arabic- and English-speaking youths in Sydney, Australia. *Journal of Paediatrics and Child Health* 2000; 36(2):145–152.
335. Rissel C, McLellan L, Bauman A. Factors associated with delayed tobacco uptake among Vietnamese/Asian and Arabic youth in Sydney, NSW. *Australian and New Zealand Journal of Public Health* 2000; 24(1):22–28.
336. Maher L, Dixon D, Lynskey M, Hall W. *Running the Risks: Heroin, Health and Harm in South West Sydney*. Monograph No. 38. Sydney: National Drug and Alcohol Research Centre, 1998.
337. Louie R, Krousos D, Gonzalez M, Crofts N. Vietnamese-speaking injecting drug users in Melbourne: the need for harm reduction programs. *Australian and New Zealand Journal of Public Health* 1998; 22:481–484.
338. Jukic A, Pino N, Flaherty B. *Alcohol and Other Drug Use, Attitudes and Knowledge Amongst Italian-speakers in Sydney*. Sydney: Drug and Alcohol Directorate, NSW Health Department, 1997.
339. Jukic A, Pino N, Flaherty B. *Alcohol and Other Drug Use, Attitudes and Knowledge amongst Arabic-Speakers in Sydney*. Sydney: New South Wales Health Department., 1996.
340. Bertram S, Flaherty B. *Alcohol and Other Drug Use, Attitudes and Knowledge amongst Spanish speakers in Sydney and Wollongong*. Sydney, NSW: NSW Health Department., 1993.
341. Everingham S, Martin A, Flaherty B. *Alcohol and Other Drug Use, Attitudes and Knowledge amongst Greek-speakers in Sydney*. Sydney, NSW: NSW Health Department / Drug and Alcohol Directorate, 1994.
342. Everingham S, Flaherty B. *Alcohol and Other Drug Use, Attitudes and Knowledge amongst Chinese-speakers in Sydney*. Sydney, NSW: NSW Health Department of Health / Drug and Alcohol Directorate, 1995.
343. Thomas DB, Karagas MR. Migrant studies. In Schottenfeld D, Fraumeni JF (eds) *Cancer Epidemiology and Prevention*. 2nd ed. New York: Oxford University Press, 1996.
344. Raftery J, Jones DR, Rosato M. The mortality of first and second generation Irish migrants in the UK. *Social Science and Medicine* 1990; 31(5):577–584.
345. Rahav G, Hasin D, Paykin A. Drinking patterns of recent Russian immigrants and other Israelis: 1995 national survey results. *American Journal of Public Health* 1999; 89(8):1212–1216.
346. Razum O, Zeeb H, Akgun HS, Yilmaz S. Low overall mortality of Turkish residents in Germany persists and extends into a second generation: merely a healthy migrant effect? *Tropical Medicine and International Health* 1998; 3(4):297–303.
347. Gilbert MJ. Alcohol consumption patterns in immigrant and later generation Mexican American Women. *Hispanic Journal of Behavioural Science* 1987; 9(3):299–313.

348. Harding S. The incidence of cancers among second generation Irish living in England and Wales. *British Journal of Cancer* 1998; 78(7):958–961.
349. Harding S, Balajaran. R. Patterns of mortality in second generation Irish living in England and Wales: longitudinal study. *British Medical Journal* 1996; 312:1389–1392.
350. Harding S, Rosato M. Cancer incidence among first generation Scottish, Irish, West Indian and Asian migrants living in England and Wales. *Ethnicity and Health* 1999; 4(1/2):83–92.
351. Young C. Changes in demographic behaviour of migrants in Australia and the transition between generations. *Population Studies* 1991; 45:67–89.
352. Scribner R. Paradox as paradigm - the health outcomes of Mexican-Americans. *American Journal of Public Health* 1996; 86(303–305).
353. British Medical Journal. Style matters: ethnicity, race and culture. *British Medical Journal* 1996; 312:1094.
354. Cavelaars AEJM, Kunst AE, Geurts JJM, Crialesi R, Helmer U, Lahelma E, et al. Educational differences in smoking: international comparison. *British Medical Journal* 2000; 320:1102–1107.
355. Drever F, Whitehead M, Roden M. Current patterns and trends in male mortality by social class, based on occupation. *Population Trends* 1996; 86:15–20.
356. Glendinning A, Shucksmith J, Hendry L. Social class and adolescent smoking behaviour. *Social Science and Medicine* 1994; 38(10):1449–1660.
357. Lee AL, Crombie IK, Smith WCS, Tunstall-Pedoe HD. Cigarette smoking and employment status. *Social Science and Medicine* 1991; 33(11):1309–1312.
358. Romelsjo A, Lundberg M. Changes in the social class distribution of moderate and high alcohol consumption and of alcohol-related disabilities in Stockholm and in Sweden. *Addiction* 1996; 91(9):1307–1323.
359. Rossow I, Amundsen. A. The disadvantage of being advantaged? On a social gradient in excess mortality among alcohol abusers. *Addiction* 1996; 91(12):1821–1829.
360. Townsend J, Roderick P, Cooper J. Cigarette smoking by socio-economic group, sex and age: effects of price, income and health publicity. *British Medical Journal* 1994; 309:923–927.
361. Edwards G, Kyle E, Nicholls P, Taylor C. Alcoholism and correlates of mortality: implications for epidemiology. *Journal of Studies on Alcohol* 1978; 39(9):1607–1617.
362. Harrison L, Gardiner E. Do the rich really die young? Alcohol-related mortality and social class in Great Britain, 1988 - 1994. *Addiction* 1999; 94(12):1871–1880.
363. Jarvis MJ, Wardle J. Social patterning of individual health behaviours: the case of cigarette smoking. In Marmot M, Wilkinson RG (eds) *Social Determinants of Health*. New York: Oxford, 1999;240–255.
364. Mullen K. Religion and health: a review of the literature. *International Journal of Sociology and Social Policy* 1990; 10(85–95).
365. Mullen K, Williams R, Hunt K. Irish descent, religion and alcohol and tobacco use. *Addiction* 1996; 91(2):243–254.
366. Abbotts J, Williams R, Ford G, Hunt K, West P. Morbidity and Irish-Catholic descent in Britain: relating health disadvantage to behaviour. *Ethnicity and Health* 1999; 4(4):221–230.
367. Francis LJ, Mullen K. Religiosity and attitudes towards drug use among 13 to 15 year olds in England. *Addiction* 1993; 88(5):665–672.
368. Klonoff EA, Landrine H. Acculturation and alcohol use among blacks: the benefits of remaining culturally traditional. *Western Journal of Black Studies* 1999; 23(4):211–216.
369. Caetano R, Katsunas L. Changes in drinking patterns among whites, blacks and Hispanics, 1984 - 1992. *Journal of Studies on Alcohol* 1995; 56:558–565.
370. Mueser KT, Kavanagh D. Treating comorbidity of alcohol problems and psychiatric disorder. In Heather N, Peters TJ, Stockwell T (eds) *International Handbook of Alcohol Dependence and Problems*. Chichester: John Wiley and Sons, 2001;627–648.
371. Khantzian EJ. The self-medication hypothesis of addictive disorders: Focus on heroin and cocaine dependence. *American*

- Journal of Psychiatry 1985; 142(11):1259–1264.
372. Kessler R, Nelson C, McGonagle K, Eklund M, Frank R, Leaf P. The epidemiology of co-occurring addictive and mental disorders: implications for prevention and service utilization. *American Journal of Orthopsychiatry* 1996; 66:17–31.
 373. Hall W, Johnston L, Donnelly N. Epidemiology of cannabis use and its consequences. In Kalant H, Corrigall WA, Hall W, Smart RG (eds) *The Health Effects of Cannabis*. Toronto: Centre for Addiction and Mental Health, 1999;71–125.
 374. Ashton H. Benzodiazepine withdrawal: an unfinished story. *British Medical Journal* 1984; 288:1135–1140.
 375. Rehm J, Room R, Monteiro M, Gmel G, Graham K, Rehn N, et al. Alcohol as a risk factor for burden of disease. In World Health Organization (ed) *Comparative Quantification of Health Risks: Global and Regional Burden of Disease Due to Selected Major Risk Factors*. Geneva: World Health Organization, 2004.
 376. Kavanagh DJ. Comorbidity in mental health and substance use: causes, prevention and treatment. Paper presented at National Workshop on Comorbidity. Canberra, 6–7 March 2000.
 377. Andrews G, Hall W, Teesson M, Henderson S. *The Mental Health of Australians*. Canberra: Commonwealth Department of Health and Aged Care, April 1999.
 378. Moeller FG, Dougherty DM. Antisocial personality disorder, alcohol, and aggression. *Alcohol Research and Health* 2001; 25(1):5–11.
 379. Williams P. Windows of opportunity for intervention and prevention in a diversions environment: evidence from DUCO. Paper presented at 2nd Australasian Conference on Drugs Strategy. Perth: Western Australian Police Service, 7–9 May 2002.
 380. Dolan K, Crofts N. A review of risk behaviours, transmission and prevention of blood borne viral infections in Australian prisons. In Shewan D, Davies JB (eds) *Drug Use and Prisons. An International Perspective*. Amsterdam: Harwood Academic Publishers, 2000;215–232.
 381. Jurgens R. HIV/AIDS and drug use in prisons: moral and legal responsibilities of prison. In Shewan D, Davies JB (eds) *Drug Use and Prisons. An International Perspective*. Amsterdam: Harwood Academic Publishers, 2000;1–26.
 382. Watson J. *Hepatitis C. A Study of Prevalence in WA Prisons*. Perth: Hepatitis Council Western Australia, 2002.
 383. Brisbane City Council. The Lord Mayor's Illicit Drug Taskforce Report 1999. Brisbane City Council, 1999. Viewed 30 October 2001, <www.brisbane.qld.gov.au/council_at_work/health_safety/illicit_drugs/pdf/report1.pdf>.
 384. Briscoe S, Donnelly N. *Temporal and Regional Aspects of Alcohol-Related Violence and Disorder*. Report No. 1. New South Wales: National Drug Research Institute, Curtin University of Technology and NSW Bureau of Crime Statistics and Research, May 2001.
 385. Graham K, West P. Alcohol and crime: examining the link. In Heather N, Peters TJ, Stockwell T (eds) *International Handbook of Alcohol Dependence and Problems*. Chichester: John Wiley and Sons, 2001;439–470.
 386. Matthews S, Chikritzhs T, Catalano P, Stockwell T, Donath S. *Trends in Alcohol-Related Violence in Australia, 1991/92-1999/00*. National Alcohol Indicators Draft Bulletin No. 5. Perth: National Drug Research Institute, Curtin University of Technology, January 2002.
 387. Makkai T. Illicit drugs and crime. In Graycar A, Grabosky P (eds) *Cambridge Handbook of Australian Criminology*: Cambridge University Press, 2002.
 388. Makkai T. Drugs and property crime. In ABCI *Australian Illicit Drug Report, 1997-1998*. Canberra: ABCI, 1999;105–113.
 389. Makkai T. Drugs and crime: what does the evidence show? Paper presented at 2nd Australasian Conference on Drugs Strategy. Perth: Western Australian Police Service, 7–9 May 2002.
 390. Christie P. *The Effects of Cannabis Legislation in South Australia on Levels of Cannabis Use*. Adelaide: Drug and Alcohol Services Council, 1991.
 391. Lenton S, Christie P, Humeniuk R, Brooks A, Bennet M, Heale P. *Infringement Versus Conviction: The Social Impact of a Minor Cannabis*

- Offence Under a Civil Penalties System and Strict Prohibition in Two Australian States. Canberra: Commonwealth Department of Health and Aged Care, and the National Drug Strategy, Australian Government Publishing Service, 1999.
392. Abbey A, Zawacki T, Buck PO, Clinton AM, McAuslan P. Alcohol and sexual assault. *Alcohol Research and Health* 2001; 25(1):43–51.
393. Cameron M. *Young Men and Violence Prevention. Trends and Issues in Crime and Criminal Justice Series Report No. 154*. Canberra: Australian Institute of Criminology, June 2000.
394. Mazza D, Dennerstein L, Ryan V. Physical, sexual and emotional violence against women: A general practice-based prevalence study. *Medical Journal of Australia* 1996; 164:14–17.
395. Bennett LW. Substance abuse and the domestic assault of women. *Journal of Addictions Nursing* 1998; 10(1):40–50.
396. Lang E, Stockwell T, Rydon P, Gamble C. *Drinking Settings, Alcohol Related Harm, and Support for Prevention Policies*. Technical Report. Perth: National Centre for Research into the Prevention of Drug Abuse, Curtin University of Technology, 1992.
397. Weatherburn D, Topp L, Midford R, Allsop S. *Drug Crime Prevention and Mitigation: A Literature Review and Research Agenda*. Sydney: New South Wales Bureau of Crime Statistics and Research, 2000.
398. Johnson D. *Age of Illicit Drug Initiation*. Trends and Issues in Crime and Criminal Justice Series Report No. 201. Canberra: Australian Institute of Criminology, March 2001.
399. Friedman AS, Glickman NW, Morrissey MR. What mothers know about their adolescents' alcohol/drug use and problems and how mothers react to finding out about it. *Journal of Drug Education* 1988; 18:155–167.
400. Orford J. Control, confront or collude: how family and society respond to excessive drinking. *British Journal of Addiction* 1992; 87:1513–1526.
401. Velleman R, Bennett G, Miller T, Orford J, Rigby K, Tod A. The families of problem drug users: a study of 50 close relatives. *Addiction* 1993; 88:1281–1290.
402. Orford J, Natera G, Davies J, Nava A, Mora J, Rigby K, et al. Tolerate, engage or withdraw: a study of the structure of families coping with alcohol and drug problems in South West England and Mexico City. *Addiction* 1998; 93:1799–1813.
403. Loxley W, Papadopoulos L. *Forging Alliances with Parent Organisations*. A report to the Research and Development Committee, Division of Health Sciences, Curtin University of Technology. Perth: National Centre for Research into the Prevention of Drug Abuse, February 1999.
404. Allsop S, Bush R, Phillips M, Midford R, Fowler G, Wooden M, et al. *Alcohol and Other Drugs in the Australian Workplace: A Critical Literature Review*. Adelaide: National Centre for Education and Training on Addiction, 1997.
405. Normand J, Lempert RO, O'Brien CP. *Under the Influence? Drugs and the American Work Force*. Washington: National Academy Press; 1994.
406. Hutcheson GD, Henderson MM, Davies JB. *Alcohol in the Workplace: Cost and Responses*. Research Series No. 59. Sheffield: Department for Education and Employment, August 1995.
407. Midford R. The nature and extent of drug-related harm in the community and the implications for the workplace. In Allsop S, Phillips M, Calogero C (eds) *Drugs and Work. Responding to Alcohol and Other Drug Problems in the Australian Workplace*. Melbourne: IP Communications, 2001;42–55.
408. English D, Holman CDJ, Milne E, Winter MG, Hulse GK, Godde JP, et al. *The Quantification of Drug Caused Mortality in Australia*. Canberra: Commonwealth Department of Human Services and Health, 1995.
409. Chikritzhs T, Stockwell T, Heale P, Dietze P, Webb M. *Trends in Alcohol-Related Road Injury in Australia, 1990-1997*. National Alcohol Indicators Project Technical Report No. 2. Perth: National Drug Research Institute, Curtin University of Technology, 2000.
410. Chesher G. Cannabis and road safety. an outline of research studies to examine the effects of cannabis on driving skills and actual driving performance. In Parliament of Victoria Road Safety Committee (ed) *Inquiry into the Effects of Drugs (other than alcohol) on Road*

- Safety. Melbourne: Road Safety Committee, Parliament of Victoria, 1995;67–96.
411. Robbe HWJ. *Influence of Marijuana on Driving*. Maastricht: Institute for Human Psychopharmacology, University of Limburg; 1994.
412. Road Safety Committee. *The Effects of Drugs (Other than Alcohol) on Road Safety*. Report No. 34. Melbourne: Parliament of Victoria, May 1995.
413. Hunter C, Lokan R, Longo M, White J, White M. *The Prevalence and Role of Alcohol, Cannabinoids, Benzodiazepines and Stimulants in Non-Fatal Road Crashes*. Adelaide: Department of Clinical and Experimental Pharmacology, University of Adelaide, 1998.
414. Poyser C, Makkai T, Norman L, Mills L. *Drug Driving Among Police Detainees in Three States of Australia: Final Report*. Australian Institute of Criminology and Queensland Police Service, 2002.
415. Lynch J. Social epidemiology: some observations about the past, present and future. *Australasian Epidemiologist* 2000; 7.3:7–15.
416. Blakely T. Counterfactual challenges to social epidemiology. *Australasian Epidemiologist* 2000; 7(3):28–31.
417. Marmot M. Social determinants of health: from observation to policy. *Medical Journal of Australia* 2000; 172:379–382.
418. Marmot M, Wilkinson RG, eds. *Social Determinants of Health*. New York: Oxford; 1999.
419. Spooner C, Hall W, Lynskey M. *Structural Determinants of Youth Drug Use*. Woden, ACT: Australian National Council on Drugs, 2001.
420. Acheson D, Barker D, Chambers J, Graham H, Marmot M, Whitehead M. *Independent Inquiry into Inequalities in Health Report*. United Kingdom: Secretary of State for Health, November 1998.
421. Wilkinson R. Commentary: liberty, fraternity, equality. *International Journal of Epidemiology* 2002; 31:538–543.
422. Deaton A. Commentary: the convoluted story of international studies of inequality and health. *International Journal of Epidemiology* 2002; 31:546–549.
423. Turrell G. Income inequality and health: in search of fundamental causes. In Eckersley R, Dixon J, Douglas B (eds) *The Social Origins of Health and Well-being*. Cambridge: Cambridge University Press, 2001;83–104.
424. Mackenbach JP. Income inequality and health. *British Medical Journal* 2002; 324:1–2.
425. Deaton A. *Health, Inequality, and Economic Development*. CMH Working Paper Series. Paper No. WG1:3. Geneva: WHO Commission on Macroeconomics and Health, 2001.
426. Brunner E, Marmot M. Social organization, stress, and health. In Marmot M, Wilkinson RG (eds) *Social Determinants of Health*. New York: Oxford, 1999;17–42.
427. Kawachi I. Why social epidemiology? *Australasian Epidemiologist* 2000; 7.3:5–6.
428. Najman JM. A general model of the social origins of health and well-being. In Eckersley R, Dixon J, Douglas B (eds) *The Social Origins of Health and Well-being*. Cambridge: Cambridge University Press, 2001;73–82.
429. Keating DP, Hertzman C. Modernity's paradox. In Keating DP, Hertzman C (eds) *Developmental Health and the Wealth of Nations. Social, Biological, and Educational Dynamics*. New York: Guilford Press, 1999;1–17.
430. Daniels N, Kennedy BP, Kawachi I. Why justice is good for our health: The social determinants of health inequalities. *Daedalus* 1999; 128(4):215–251.
431. Wilkinson RG. *Unhealthy Societies. The Afflictions of Inequality*. London: Routledge; 1996.
432. Mackenbach JP, Cavelaars E, Kunst AE, Groenhouf F. Socioeconomic inequalities in cardio-vascular disease mortality. *European Heart Journal* 2000; 21:1141–1151.
433. Spooner C, Mattick R, Noffs W. *The Nature and Treatment of Adolescent Substance Abuse*. Monograph No. 40. Sydney: National Drug and Alcohol Research Centre, 1999.
434. Kawachi I, Kennedy BP, Glass R. Social capital and self-rated health: A contextual analysis. *American Journal of Public Health* 1999; 89(8):1187–1192.
435. Broom D. Gender and health. In Germov J (ed) *Second Opinion: An Introduction to Health*

- Sociology. Melbourne: Oxford University Press, 1999;39–56.
436. Shaw M, Dorling D, Davey Smith G. Poverty, social exclusion, and minorities. In Marmot M, Wilkinson RG (eds) *Social Determinants of Health*. Oxford: Oxford University Press, 1999;211–239.
437. Spooner C, Mattick R, Howard J. *The Nature and Treatment of Adolescent Substance Abuse*. Final Report of the Adolescent Treatment Research Project. Monograph No. 26. Sydney: National Drug and Alcohol Research Centre, 1996.
438. Eckersley R. Culture, health and well-being. In Eckersley R, Dixon J, Douglas B (eds) *The Social Origins of Health and Wellbeing*. Cambridge: Cambridge University Press, 2001;51–70.
439. Cashmore J. Family, early development and the life course: common risk and protective factors in pathways to prevention. In Eckersley R, Dixon J, Douglas B (eds) *The Social Origins of Health and Well-being*. Cambridge: Cambridge University Press, 2001;216–224.
440. Leeder S. Social epidemiology and health inequalities in Australia (and beyond). *Australasian Epidemiologist* 2000; 7(3):2–4.
441. Eckersley R, Dixon J, Douglas B, eds. *The Social Origins of Health and Well-being*. Cambridge: Cambridge University Press; 2001.
442. Najman JM, Smith GD. The embodiment of class-related and health inequalities: Australian policies. *Australian and New Zealand Journal of Public Health* 2000; 24(1):3–4.
443. Najman JM. Class inequalities in health and lifestyle. In Waddell C, Petersen AR (eds) *Just Health. Inequality in Illness, Care and Prevention*. Melbourne: Churchill Livingstone, 1994;27–46.
444. Turrell G, Mathers CD. Socioeconomic status and health in Australia. *Medical Journal of Australia* 2000; 172:434–438.
445. Kawachi I, Kennedy BP, Wilkinson RG. Crime: social disorganization and relative deprivation. *Social Science and Medicine* 1999; 48(6):719–731.
446. Siggers S, Gray D. *Aboriginal Health and Society: The Traditional and Contemporary Struggle for Better Health*. Sydney: Allen and Unwin; 1991.
447. House of Representatives, Standing Committee on Family and Community Affairs. *Health is Life: Report on the Inquiry into Indigenous Health*. Canberra: House of Representatives, Standing Committee of Family and Community Affairs, 2000.
448. McLennan W, (Australian Statistician). *Census of Population and Housing: Aboriginal and Torres Strait Islander People, Australia 1996*. Catalogue No. 2034.0. Canberra: Australian Bureau of Statistics, 1998.
449. Julian R. Ethnicity, health and multiculturalism. In Germov J (ed) *Second opinion. An Introduction to Health Sociology*. Melbourne: Oxford University Press, 1999;77–95.
450. Wilkinson RG. Putting the picture together: prosperity, redistribution, health, and welfare. In Marmot M, Wilkinson RG (eds) *Social Determinants of Health*. New York: Oxford, 1999;256–274.
451. Corin E. The cultural frame: context and meaning in the construction of health. In Amick BC, Levine S, Tarlov AR, Chapman Walsh D (eds) *Society and Health*. New York: Oxford University Press, 1995.
452. Bartley M, Ferrie J, Montgomery SM. Living in a high-unemployment economy: understanding the health consequences. In Marmot M, Wilkinson RG (eds) *Social Determinants of Health*. New York: Oxford, 1999;81–104.
453. Stockwell T, Dyskin E, O'Connor J. *The Impact of the Tobacco Control Act (WA) 1990 on Perth School Children 1991-1994*. Perth: National Centre for Research into the Prevention of Drug Abuse, Curtin University of Technology, 1995.
454. Stockwell T, Daly A, Phillips A, Masters L, Midford R, Gahegan M, et al. Total versus hazardous per capita alcohol consumption as predictors of acute and chronic alcohol related harm. *Contemporary Drug Problems* 1996; 23(3):441–464.
455. Heale P, Chikritzhs T, Jonas H, Stockwell T, Dietze P. Estimated alcohol-caused deaths in Australia, 1990-97. *Drug and Alcohol Review* 2002; 21(2):121–129.
456. Chikritzhs T, Stockwell T, Heale P, Dietze P, Webb M. *Trends in Alcohol-Related Road Injury in Australia, 1990-1997*. National Alcohol

- Indicators Project Bulletin No. 2. Perth: National Drug Research Institute, Curtin University of Technology, May 2000.
457. Homel R, Elias G, Hay I. Developmental prevention in a disadvantaged community. In Eckersley R, Dixon J, Douglas B (eds) *The Social Origins of Health and Wellbeing*. Cambridge: Cambridge University Press, 2001;269–279.
458. Corin E. The social and cultural matrix of health and disease. In Evans RG, Barer ML, Marmour TR (eds) *Why are Some People Healthy and Others Not? The Determinants of Health of Populations*. New York: Aldine de Gruyter, 1994.
459. Toumbourou J. *Implementing Communities that Care in Australia: A Community Mobilisation Approach to Crime Prevention*. Report No. 122. Canberra: Australian Institute of Criminology, July 1999.
460. Bond L, Carlin JB, Thomas L, Rubin K, Patton G. Does bullying cause emotional problems? A prospective study of young teenagers. *British Medical Journal* 2001; 323:480–484.
461. Williams B, Sanson A, Toumbourou J, Smart D. *Patterns and Predictors of Teenagers use of Licit and Illicit Substances in the Australian Temperament Project Cohort 2000*.
462. Fergusson DM, Horwood LJ, Lynskey MT. The effects of unemployment on psychiatric illness during young adulthood. *Psychological Medicine* 1997; 27(2):371–381.
463. Public Health Division Victorian Department of Human Services. *Drugs in a Multicultural Community: An Assessment of Involvement*. Melbourne: Public Health Division Victorian Department of Human Services, 2000.
464. Groves R. The lost families: refugees and International Year of the Family. *Development Bulletin* 1993; 29:8–9.
465. Kumpfer KL, Olds DL, Alexander JF, Zucker RA, Gary LE. Family etiology of youth problems. In Ashery RS, Robertson EB, Kumpfer KL (eds) *Drug abuse prevention through family interventions, NIDA Research Monograph 177*. Rockville, MD: National Institute on Drug Abuse, 1998;42–77.
466. Madden R, (Acting Australian Statistician). *National Aboriginal and Torres Strait Islander Survey 1994: Detailed Findings*. Catalogue No. 4190.0. Canberra: Australian Bureau of Statistics, 1995.
467. Cunningham J. *Occasional Paper: Cigarette Smoking Among Indigenous Australians, 1994*. Catalogue No. 4701.0. Canberra: Australian Bureau of Statistics, 1997.
468. Ivers R. *Indigenous Australians and Tobacco: A Literature Review*. Darwin: Menzies School of Health Research, 2001.
469. Hogg RS. Variability in behavioural risk factors for heart disease in an Australian Aboriginal community. *Journal of Biosocial Science* 1994; 19(2):159–173.
470. Strauss A, Corbin J. *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*. Newbury Park, CA: Sage Publications; 1990.
471. *National Mental Health Strategy. Promotion, Prevention and Early Intervention for Mental Health*. Canberra: Department of Health and Aged Care, 1999.
472. National Crime Prevention - Attorney-General's Department. *Pathways to Prevention: Developmental and Early Intervention Approaches to Crime in Australia. Appendices*. Canberra: National Crime Prevention - Attorney-General's Department, 1999.
473. Coie JD, Watt NF, West SG, Hawkins JD, Asarnow JR, Markman HJ, et al. The science of prevention: a conceptual framework and some directions for a national research program. *American Psychologist* 1993; 48:1013–1022.
474. Kellam SG, Rebok GW. Building developmental and etiological theory through epidemiologically based preventive intervention trials. In McCord J, Tremblay RE (eds) *Preventing Antisocial Behavior: Interventions from Birth through Adolescence*. New York: Guilford Press, 1992;162–195.
475. Stockwell T. Harm reduction, drinking patterns and the NHMRC Drinking Guidelines. *Drug and Alcohol Review* 2001; 20:121–129.
476. Newcomb MD, Maddahian E, Bentler PM. Risk factors for drug use among adolescents: concurrent and longitudinal analyses. *American Journal of Public Health* 1986; 76:525–531.

477. Glantz MD, Leshner AI. Drug abuse and developmental psychopathology. *Development and Psychopathology* 2000; 12:795–814.
478. Mitchell P, Sanson A, Spooner C, Copeland J, Vimpani G, Toumbourou JW, et al. *The Role of Families in the Development, Identification, Prevention and Treatment of Illicit Drug Problems*. A literature review prepared for the National Illicit Drug Strategy Working Committee and the National Health and Medical Research Council. Canberra: Commonwealth of Australia, March 2001.
479. Catalano RF, Hawkins JD. The Social Development Model: a theory of antisocial behavior. In Hawkins JD (ed) *Delinquency and Crime: Current Theories*. New York: Cambridge University Press, 1996;149–197.
480. Lynskey MT, Fergusson DM. Childhood conduct problems, attention deficit behaviors, and adolescent alcohol, tobacco, and illicit drug use. *Journal of Abnormal Child Psychology* 1995; 23(3):281–303.
481. Fergusson DM, Horwood LJ, Lynskey M. The childhoods of multiple problem adolescents: a 15-year longitudinal study. *Journal of Child Psychology and Psychiatry* 1994; 35(6):1123–1140.
482. McCain MN, Mustard JF. *Early Years Report: Reversing the Real Brain Drain. Final Report*. Ontario: The Canadian Institute for Advanced Research, 1999.
483. Silburn SR, Zubrick SR, Garton A, Gurrin L, Burton P, Dalby R, et al. *Western Australian Child Health Survey: Family and Community Health*. Perth: Australian Bureau of Statistics and TVW Telethon Institute for Child Health Research, 1996.
484. Fergusson DM, Horwood LJ, Lynskey MT. The prevalence and risk factors associated with abusive or hazardous alcohol consumption in 16-year-olds. *Addiction* 1995; 90:935–946.
485. Toumbourou JW, Gregg ME. Impact of an empowerment-based parent education program on the reduction of youth suicide risk factors. *Journal of Adolescent Health* 2002; 31(3):279–287.
486. Weinberg NZ. Adolescent substance abuse: a review of the past ten years. *Journal of the American Academy of Child and Adolescent Psychiatry* 1998; 37(3):252–261.
487. Pape H, Hammer T. How does young people's alcohol consumption change during the transition to early adulthood? A longitudinal study of changes at aggregate and individual level. *Addiction* 1996; 91(9):1345–1357.
488. Holdcroft LC, Iacono WG. Cohort effects on gender differences in alcohol dependence. *Addiction* 2002; 97:1025–1036.
489. Pulkkinen L, Pitkanen T. A prospective study of the precursors to problem drinking in young adulthood. *Journal of Studies on Alcohol* 1994; 55:578–587.
490. McGue M, Iacono WG, Legrand LN, Elkins I. Origins and consequences of age at first drink. II. Familial risk and heritability. *Alcoholism: Clinical and Experimental Research* 2001; 25(8):1166–1173.
491. Moscato BS, Russell M, Zielezny M, Bromet E, Egri G, Mudar P, et al. Gender differences in the relation between depressive symptoms and alcohol problems: a longitudinal perspective. *American Journal of Epidemiology* 1997; 146(11):966–974.
492. Fergusson DM, Horwood LJ. Does cannabis use encourage other forms of illicit drug use? *Addiction* 2000; 95(4):505–520.
493. Prior M, Sanson A, Smart D, Oberklaid F. *Pathways from Infancy to Adolescence: Australian Temperament Project 1983-2000*. Melbourne: Australian Institute of Family Studies, 2000.
494. Werner E, Smith R. *Overcoming the Odds: High-Risk Children from Birth to Adulthood*. New York: Cornell University; 1992.
495. Rutter M. Psychosocial resilience and protective mechanisms. *American Journal of Orthopsychiatry* 1987; 57(3):316–331.
496. Henry B, Feehan M, McGee R, Stanton W. The importance of conduct problems and depressive symptoms in predicting adolescent substance use. *Journal of Abnormal Child Psychology* 1993; 21(5):469–480.
497. Huba GJ, Bentler PM. The role of peer and adult models for drug taking at different stages in adolescence. *Journal of Youth and Adolescence* 1980; 9:449–465.
498. Hansen WB, Graham JW. Preventive alcohol, marijuana and cigarette use among adolescents: peer pressure resistance training versus establishing conservative

- norms. *Preventive Medicine* 1991; 20(3):414–430.
499. Vinson T. *Unequal in Life: The Distribution of Social Disadvantage in Victoria and New South Wales*. Richmond, Vic: Jesuit Social Services, 1999.
500. Smart R, Adlaf E, Walsh G. Neighbourhood socio-economic factors in relation to student drug use and programs. *Journal of Child and Adolescent Substance Abuse* 1994; 3:37–46.
501. Bobashev GV, Anthony JC. Clusters of marijuana use in the United States. *American Journal of Epidemiology* 1998; 148:1168–1174.
502. Petronis KR, Anthony JC. Paths of “transmission” of cocaine use and perceived risk of cocaine use within U.S. neighbourhoods. *American Journal of Epidemiology* 1999; 149:S43.
503. Ward Hinds M. Impact of local ordinance banning tobacco sale to minors. *Public Health Reports* 1992; 107:355–358.
504. Forster JL, Murray DM, Wolfson M, Blaine TM, Wagenaar AC, Hennrikus DJ. The effects of community policies to reduce youth access to tobacco. *American Journal of Public Health* 1998; 88:1193–1198.
505. Jason LA, Ji PY, Anes MD, Birkhead SH. Active enforcement of cigarette control laws in the prevention of cigarette sales to minors. *Journal of the American Medical Association* 1991; 266:3159–3161.
506. Perry CL, Williams CL, Forster JL, Wolfson M, Wagenaar AC, Finnegan JR, et al. Background, conceptualization and design of a community-wide research program on adolescent alcohol use: Project Northland. *Health Education Research Theory and Practice* 1993; 8(125–136).
507. Flynn BS, Worden JK, Secker-Walker RH, Pirie PL, Badger GJ, Carpenter JH. Long-term responses of higher and lower risk youths to smoking prevention interventions. *Preventive Medicine* 1997; 26:389–394.
508. Brody GH, Forehand R. Prospective associations among family form, family processes, and adolescents’ alcohol and drug use. *Behaviour Research Therapy* 1993; 31(6):587–593.
509. Hawkins JD, Lishner D, Catalano RF. Childhood predictors and the prevention of adolescent substance abuse. In Jones CL, Battjes RJ (eds) *Etiology of Drug Abuse: Implications for Prevention*. NIDA Research Monograph No. 56. Washington, DC: U.S. Government Printing Office, 1985;75–126.
510. Loeber R, Dishion TJ. Early predictors of male delinquency: A review. *Psychological Bulletin* 1983; 94:68–99.
511. Spoth R, Redmond C, Hockaday C, Yoo S. Protective factors and young adolescent tendency to abstain from alcohol use: a model using two waves of intervention study data. *American Journal of Community Psychology* 1996; 24:749–770.
512. Hussong AM, Chassin L. Substance use initiation among adolescent children of alcoholics: testing protective factors. *Journal for Studies in Alcohol* 1997; 58:272–279.
513. Wills TA, DuHamel K, Viccaro D. Activity and mood temperament as predictors of adolescent substance use: test of a self-regulation mediational model. *Journal of Personality and Social Psychology* 1995; 68(5):901–916.
514. Campo AT, Rohner RP. Relationships between perceived parental acceptance-rejection. Psychological adjustment, and substance abuse among young adults. *Child Abuse and Neglect* 1992; 16:429–440.
515. Dishion TJ, Capaldi D, Spracklen KM, Li F. Peer ecology of male adolescent drug use. *Development and Psychopathology* 1995; 7:803–824.
516. Blackson CT. Temperament and IQ mediate the effects of family history of substance abuse and family dysfunction on academic achievement. *Journal of Clinical Psychology* 1995; 51(1):113–122.
517. Steele RG, Forehand R, Armistead L, Brody G. Predicting alcohol and drug use in early adulthood: the role of internalizing and externalizing behavior problems in early adolescence. *American Journal of Orthopsychiatry* 1995; 65(3):380–388.
518. Simons RL, Whitbeck LB, Conger RD, Melby JN. The effect of social skills, values, peers and depression on adolescent substance use. *Journal of Early Adolescence* 1991; 11:466–481.

519. Kandel DB, Andrews K. Processes of adolescent socialization by parents and peers. *International Journal of the Addictions* 1987; 22:319–342.
520. Dielman TE. School-based research on the prevention of adolescent alcohol use and misuse: methodological issues and advances. *Journal of Research on Adolescence* 1994; 4(2):271–293.
521. Orford J. *Excessive Appetites. A Psychological View of Addictions*. 2 ed. Chichester: John Wiley and Sons; 2001.
522. Aitken SS, DeSantis J, Harford TC, Fe Caces M. Marijuana use among adults. A longitudinal study of current and former users. *Journal of Substance Abuse* 2000; 12:213–226.
523. White HR, Johnson V, Buyske S. Parental modeling and parenting behavior effects on offspring alcohol and cigarette use. A growth curve analysis. *Journal of Substance Abuse* 2000; 12:287–310.
524. Homel R, McIlwain G, Carvolth R. Creating safer drinking environments. In Heather N, Peters TJ, Stockwell T (eds) *International Handbook of Alcohol Dependence and Problems*. Chichester: John Wiley and Sons, 2001;721–740.
525. Bryant M, Williams P. *Alcohol and Other Drug-related Violence and Non-reporting*. Trends and Issues in Crime and Criminal Justice Series Report No. 171. Canberra: Australian Institute of Criminology, 2000.
526. Bond L, Thomas L, Toumbourou J, Patton G, Catalano R. *Improving the Lives of Young Victorians in our Community: A Summary Report*. Melbourne: Community Care Division, Victorian Department of Human Services, 2000.
527. Hawkins JD, Arthur MW, Catalano RF. Preventing substance abuse. In Farrington D, Tonry M (eds) *Crime and Justice: A Review of Research: Vol. 18. Crime Prevention*. Chicago: University of Chicago Press, 1995.
528. Loeber R, Stouthamer-Loeber MS, Van Kammen W, Farrington DP. Initiation, escalation, and desistance in juvenile offending and their correlates. *Journal of Criminal Law and Criminology* 1991; 82:36–82.
529. Rose G. Sick individuals and sick populations. *International Journal of Epidemiology* 1985; 14:32–38.
530. Stockwell T, Hawks D, Lang E, Rydon P. Unravelling the preventive paradox for acute alcohol problems. *Drug and Alcohol Review* 1996; 15(1):7–15.
531. Gmel G, Klingemann S, Muller R, Brenner D. Revising the preventive paradox: The Swiss case. *Addiction* 2001; 96(2):273–284.
532. Chabon SS, Lee-Wilkerson D, Green TJ. Drug-exposed infants and children: living with a lethal legacy. *Clinics in Communication Disorders* 1992; 2(2):32–51.
533. Ettlinger T. In harm's way: recognizing and addressing alcohol risk for rural disadvantaged pregnant mothers. *Public Health Nursing* 2000; 17(3):207–210.
534. Olds DL, Henderson CR, Kitzman HJ, Eckenrode JJ, Cole RE, Tatelbaum RC. Prenatal and infancy home visitation by nurses: recent findings. *The Future of Children* 1999; 9(1):44–65.
535. Olds DL, Eckenrode JJ, Henderson CR. Long-term effects of home visitation on maternal life course and child abuse and neglect. Fifteen-year follow-up of a randomized trial. *Journal of American Medical Association* 1997; 278:637–643.
536. Olds DL, Henderson CR, Cole RE. Long-term effects of nurse home visitation on children's criminal and antisocial behavior. Fifteen-year follow-up of a randomized trial. *Journal of American Medical Association* 1998; 280:1238–1244.
537. World Health Organization. *Tobacco Free Initiative. International Consultation on Environmental Tobacco Smoke (ETS) and Child Health*. Geneva, Switzerland: World Health Organization, 11–14 January 1999.
538. Rikard-Bell G, Waters E, Ward J. Smoking related issues and paediatricians: a systematic review of the literature. 2001.
539. Waters E, Campbell R, Webster P, Spencer NJ. The effects of smoking cessation and prevention programs for families and carers on child health outcomes (Protocol). In *The Cochrane Library*. Oxford: Update Software, 1999.

540. Copeland J, Hall W. A comparison of predictors of treatment drop-out of women seeking drug and alcohol treatment in a specialist women's and two traditional mixed-sex treatment services. *British Journal of Addiction* 1992; 87(6):883–890.
541. Nakamura K, Takano T. Family involvement for improving abstinence rates in the rehabilitation process of female alcoholics. *International Journal of the Addictions* 1991; 26(10):1055–1064.
542. Armstrong KL, Fraser JA, Dadds MR, Morris J. A randomised controlled trial of nurse home visiting to vulnerable families with newborns. *Journal of Paediatrics and Child Health* 2002; 35:237–244.
543. Meager I, Milgrom J. Group treatment for postpartum depression: a pilot study. *Australian and New Zealand Journal of Psychiatry* 1996; 30:852–860.
544. Feldman MA, Sparks B, Case L. Effectiveness of home-based early intervention on the language development of children of mothers with mental retardation. *Research in Developmental Disabilities* 1993; 14:387–408.
545. Serketich WJ, Dumas JE. The effectiveness of behavioral parent training to modify antisocial behavior in children: a meta-analysis. *Behavior Therapy* 1996; 27:171–186.
546. Patterson GR, Reid JB, Dishion TJ. *Antisocial Boys*. Eugene, OR: Castalia Publishing; 1992.
547. Dadds MR, Schwartz S, Sanders MR. Marital discord and treatment outcome in behavioral treatment of child conduct disorders. *Journal of Consulting and Clinical Psychology* 1987; 55(3):396–403.
548. Webster-Stratton C. Predictors of treatment outcome in parent training for conduct disordered children. *Behavior Therapy* 1985; 16:223–243.
549. Webster-Stratton C. Stress: a potential disruptor of parent perceptions and family interactions. Special Issue: the stresses of parenting. *Journal of Clinical Child Psychology* 1990; 19(4):302–312.
550. Sanders M, Markie-Dadds C, Tully L, Bor W. The Triple-P-Positive Parenting Program: A comparison of Enhanced, Standard, and Self-directed behavioural family intervention for parents of children with early onset conduct problems. *Journal of Consulting and Clinical Psychology* 2000; 68(4):624–640.
551. Webster-Stratton C, Hammond M. Treating children with early-onset problems: a comparison of child and parent training interventions. *Journal of Consulting and Clinical Psychology* 1997; 65:93–109.
552. Webster-Stratton C. Preventing conduct problems in Head Start children: strengthening parenting competencies. *Journal of Consulting and Clinical Psychology* 1998; 66(5):715–730.
553. Forehand R, Long N. Outpatient treatment of the acting out child: procedures, long term follow-up data, and clinical problems. *Advances in Behavior Research and Therapy* 1988; 10:129–177.
554. Long P, Forehand R, Wierson M, Morgan A. Does parent training with young noncompliant children have long-term effects? *Behavior Research and Therapy* 1994; 32(1):101–107.
555. Schuhmann EM, Foote RC, Eyberg SM, Boggs SR, Algina J. Efficacy of parent-child interaction therapy: interim report of a randomized trial with short-term maintenance. *Journal of Clinical Child Psychology* 1998; 27(1):34–45.
556. Eyberg S, Funderburk B, Hembree-Kigin T, McNeil C, Querido J, Hood K. Parent-child interaction therapy with behaviour problem children: one and two year maintenance of treatment effects in the family. *Child and Family Behavior Therapy* 2001; 23:1–20.
557. Funderburk B, Eyberg S, Newcomb K, McNeil C, Hembree-Kigin T, Capage L. Parent-child interaction therapy with behaviour problem children: maintenance of treatment effects in the school setting. *Child and Family Behavior Therapy* 1998; 20:17–38.
558. McNeil C, Eyberg S, Eisenstadt T, Newcomb K, Funderburk B. Parent-child interaction therapy with behavior problem children: generalization of treatment effects to the school setting. *Journal of Clinical Child Psychology* 1991; 20(2):140–151.
559. Eisenstadt T, Eyberg S, McNeil C, Newcomb K, Funderburk B. Parent-child interaction therapy with behaviour problem children: relative effectiveness of two stages and

- overall treatment outcome. *Journal of Clinical Child Psychology* 1993; 22:42–51.
560. Kazdin AE. Treatment of antisocial behaviour in children: current status and future directions. *Psychological Bulletin* 1987; 102:187–203.
561. Kazdin AE. Treatment of conduct disorder: progress and directions in psychotherapy research. Special Issue: toward a developmental perspective on conduct disorder. *Development and Psychopathology* 1993; 5(1–2):277–310.
562. Christensen A, Johnson SM, Phillips S, Glasgow RE. Cost effectiveness in behavioral family therapy. *Behavior Therapy* 1980; 11:208–226.
563. Greenwood PW, Model KE, Rydell P, Chiesa J. *Diverting Children from a Life of Crime: Measuring Costs and Benefits*. Santa Monica, CA: RAND Corporation; 1996.
564. Campbell F, Ramey C. Effects of early intervention on intellectual and academic achievement: a follow-up study of children from low-income families. *Child Development* 1994; 65:684–698.
565. Andersson BE. Effects of day-care on cognitive and socioemotional competence of thirteen-year-old Swedish school children. *Child Development* 1992; 63:20–36.
566. Schweinhart LJ, Barnes HV, Weikart DP. *Significant Benefits: The High/Scope Perry Pre-School Study Through Age 27*. Monograph of the High Scope Educational Research Foundation No. 10. Ypsilanti, MI: High Scope Press, 1993.
567. Osburn AF, Milbank JE. *The Effects of Early Education: A Report from the Child Health and Education Study*. Oxford: Clarendon Press; 1987.
568. Lee V, Brooks-Gunn J, Schnur E, Liaw F. Are Head Start effects sustained? A longitudinal follow-up comparison of disadvantaged children attending Head Start, no preschool, and other preschool programs. *Child Development* 1990; 61:495–507.
569. US Department of Health and Human Services. *Early Head Start research: Making a difference in the lives of infants and toddlers and their families: the impacts of Early Head Start*. Child Outcomes Research and Evaluation, 2002. Viewed 29/10/02 2002, <http://www.acf.dhhs.gov/programs/core/ongoing_research/ehs/ehs_reports.html>.
570. Schweinhart LJ, Weikart DP. The High/Scope Preschool Curriculum Comparison Study through age 23. *Early Childhood Research* 1997; 12:117–143.
571. Weikart DP, Schweinhart LJ. High/Scope Preschool Program outcomes. In McCord J, Tremblay RE (eds) *Preventing Antisocial Behavior: Interventions from Birth to Adolescence*. New York: Guilford Press, 1992;67–86.
572. Barnett WS. Benefit-cost analysis of preschool education: findings from a 25-year follow-up. *American Journal of Orthopsychiatry* 1993; 63(4):500–508.
573. Barnett WS. *Lives in the Balance: Age-27 Benefit-Cost Analysis of the High/Scope Perry Preschool Program*. Monograph of the High/Scope Education Research Foundation No. 8. Ypsilanti, MI: High/Scope Press, 1996.
574. Karoly LA, Greenwood PW, Everingham SS, Hoube J, Kilburn MR, Sanders M, et al. *Investing in our Children: What We Know and Don't Know About the Costs and Benefits of Early Childhood Interventions*. Santa Monica: RAND Corporation, 1998.
575. Karoly LA, Kilburn MR, Bigelow JH, Caulkins JP, Cannon JS, Chiesa JR. *Assessing Costs and Benefits of Early Childhood Intervention Programs: Overview and Application to the Starting Early Starting Smart Program*. MR-1336. Santa Monica, CA: RAND Corporation, 2001.
576. McDonald L, Coe-Braddish D, Billingham S. *Families and Schools Together: an innovative substance abuse prevention program*. *Social Work and Education* 1991; 13:118–129.
577. Greenberg MT, Domitrovich C, Bumbarger B. The prevention of mental disorders in school-aged children: current state of the field. *Prevention and Treatment [Online journal]*, Vol 4, March, 2001. Viewed <<http://journals.apa.org/prevention/volume4/pre0040001a.html>>.
578. DeWitt DJ, Steep B, Silverman G, Stevens-Lavigne A, Ellis K, Smythe C, et al. Evaluating an in-school drug prevention program for at-risk youth. *Alberta Journal of Education Research* 2000; XLVI(2):117–133.

579. Perry C, Williams CL, Veblen-Mortenson S, Toomey T, Komro K, Anstine P, et al. Project Northland: outcomes of a communitywide alcohol use prevention program during early adolescence. *American Journal of Public Health* 1996; 86:956–965.
580. MacKinnon D, Anderson Johnson C, Pentz MA, Dwyer JH. Mediating mechanisms in a school based drug prevention program: first-year effects of the Midwestern Prevention Project. *Health Psychology* 1991; 10:164–172.
581. Spoth R, Redmond C, Shin C. Direct and indirect latent-variable parenting outcomes of two universal family-focused preventive interventions: extending a public health-oriented research base. *Journal of Consulting and Clinical Psychology* 1998; 66(2):385–399.
582. Spoth RL, Redmond C, Shin C. Reducing adolescents' aggressive and hostile behaviors: randomized trial effects of a brief family intervention 4 years past baseline. *Archives of Pediatrics and Adolescent Medicine* 2000; 154:1248–1257.
583. Spoth RL, Guyll M, Day SX. Universal family-focused interventions in alcohol-use disorder prevention: cost-effectiveness and cost-benefit analyses of two interventions. *Journal of Studies on Alcohol* 2002; 63:219–228.
584. Catalano RF, Gaine RR, Fleming CB, Haggerty KP, Johnson NO. An experimental intervention with families of substance abusers: one-year follow-up of the focus on families project. *Addiction* 1999; 94:241–254.
585. DeMarsh JK, Kumpfer KL. Family environmental and genetic influences on children's future chemical dependency. *Journal of Child in Contemporary Society: Advanced Theory of applied Research* 1985; 18:117–152.
586. Lloyd C, Joyce R, Hurry J, Ashton M. The effectiveness of primary school drug education. *Drugs: Education, Prevention and Policy* 2000; 7(2):109–126.
587. Wragg J. The longitudinal evaluation of a primary school drug education program: did it work? *Drug Education Journal of Australia* 1990; 4(1):33–44.
588. Wragg J. *An Evaluation of a Model of Drug Education. National Campaign Against Drug Abuse Monograph Series No. 22.* Canberra: Australian Government Printing Service, 1992.
589. Hurry J, Lloyd C. *A Follow-up Evaluation of Project Charlie: A Lifeskills Drug Education Programme for Primary Schools.* Drug Prevention Initiative Paper No. 16. London: Home Office, 1997.
590. Stevens MM, Freeman DH, Mott L, Youells F. Three-year results of prevention programs on marijuana use: the New Hampshire study. *Journal of Drug Education* 1996; 26:257–273.
591. Peterson AV, Kealy KA, Mann SL, Marek PM, Sarason IG. Hutchinson smoking prevention project: Long-term randomized trial in school-based tobacco use prevention-results on smoking. *Journal of the National Cancer Institute* 2000; 92(24):1979–1991.
592. Sussman S, Hansen WB, Flay BR, Botvin G. Correspondence re: Hutchison smoking prevention project: long-term randomized trial in school-based tobacco use - results on smoking. *Journal of the National Cancer Institute* 2001; 93:1267.
593. Johnson CA, Pentz MA, Weber MD, Dwyer JH, Baer N, MacKinnon DP, et al. Relative effectiveness of comprehensive community programming for drug abuse prevention with high-risk and low-risk adolescents. *Journal of Consulting and Clinical Psychology* 1990; 58:447–456.
594. Shope JT, Copeland LA, Maharg R, Dielman TE. Effectiveness of a high school alcohol misuse prevention program. *Alcoholism: Clinical and Experimental Research* 1996; 20:791–798.
595. Elder J, Wildey MB, de Moore C, Sallis J, Eckhardt L, Edwards C, et al. The long-term prevention of tobacco use among junior high school students: Classroom and telephone interventions. *American Journal of Public Health* 1993; 83:1239–1244.
596. Prokhorov AV, Alexandrov AA. Prevention of adolescent smoking in Russia: General situation and results from a Moscow randomized trial. *European Journal of Public Health* 1994; 4:169–174.
597. Abernathy TJ, Bertrand LD. Preventing cigarette smoking among children: Results of a four-year evaluation of the PAL program. *Canadian Journal of Public Health* 1992; 83:226–229.

598. Snow D, Tebes JK, Arthur MW, Tapasak R. Two-year follow-up of a social-cognitive intervention to prevent substance use. *Journal of Drug Education* 1992; 22:101–114.
599. Klepp KI, Oygard L, Tell GS, Vellar OD. Twelve year follow-up of a school-based health education program: the Oslo youth study. *European Journal of Public Health* 1994; 4:195–200.
600. Perry CI, Kelder SH, Klepp K. Community-wide cardiovascular disease prevention in young people: long-term outcomes of the Class of 1989 study. *European Journal of Public Health* 1994; 4:188–194.
601. Hawthorne G. The social impact of Life Education: Estimating drug use prevalence among Victorian primary school students and the statewide effect of the Life Education programme. *Addiction* 1996; 91(8):1151–1159.
602. Snati SM, Cargo M, Brown S, Best JA, Cameron R. Dispositional risk factors for smoking-stage transitions: A social influences program as an effect modifier. *Addictive Behaviors* 1994; 19:269–285.
603. Shope JT, Kloska D, Dielman TE, Maharg R. Longitudinal evaluation of an enhanced Alcohol Misuse Prevention Study (AMPS) curriculum for grades six to eight. *Journal of School Health* 1994; 64(4):160–166.
604. Hawkins JD, Guo J, Hill K, Battin-Pearson S, Abbott R. Long term effects of the Seattle Social Development intervention on school bonding trajectories. *Applied Developmental Science: Special issue: Prevention as Altering the Course of Development* 2001; 5(4):225–236.
605. O'Donnell J, Hawkins JD, Catalano RF, Abbott RD, Day LE. Preventing school failure, drug use, and delinquency among low-income children: long-term intervention in elementary schools. *American Journal of Orthopsychiatry* 1995; 65(1):87–100.
606. Lonczak HS, Abbott RD, Hawkins JD, Kosterman R, Catalano RF. Effects of the Seattle social development project on sexual behavior, pregnancy, birth, and sexually transmitted disease outcomes by age 21 years. *Archives of Pediatrics and Adolescent Medicine* 2002; 156(5):438–447.
607. Eddy JM, Reid JB, Fetrow RA. An elementary school-based prevention program targeting modifiable antecedents of youth delinquency and violence: Linking the Interests of Families and Teachers (LIFT). *Journal of Emotional and Behavioural Disorders* 2000; 8:165–176.
608. Kellam SG, Anthony JC. Targeting early antecedents to prevent tobacco smoking: findings from an epidemiologically based randomized field trial. *American Journal of Public Health* 1998; 88:1490–1495.
609. Battistich V, Schaps E, Watson M, Solomon D. Prevention effects of the child development project: early findings from an ongoing multisite demonstration trial. *Journal of Adolescent Research* 1996; 11(1):12–35.
610. Greenberg MT, Kusche CA, Cook ET, Quamma JP. Promoting emotional competence in school-aged children: the effects of the PATHS curriculum. *Development and Psychopathology* 1995; 7(1):117–136.
611. Bierman KL. Process of change during social skills training with preadolescents and its relation to treatment outcomes. *Child Development* 1986; 57:230–240.
612. Bierman KL, Miller CL, Stabb SD. Improving the social behavior and peer acceptance of rejected boys: effects of social skills training with instructions and prohibition. *Journal of Consulting & Clinical Psychology* 1987; 55(2):194–200.
613. Coie JD, Krehbiel G. Effects of academic tutoring on the social status of low-achieving, socially rejected children. *Child Development* 1984; 55(4):1465–1478.
614. Conduct Problems Prevention Research Group. Initial impact of the Fast Track Prevention Trial for Conduct Problems: II. Classroom effects. *Journal of Consulting and Clinical Psychology* 1999; 67(5):648–657.
615. Conduct Problems Prevention Research Group. Initial impact of the Fast Track Prevention Trial for Conduct Problems: I. The high-risk sample. *Journal of Consulting and Clinical Psychology* 1999; 67(5):631–647.
616. Conduct Problems Prevention Research Group. Evaluation of the first three years of the Fast Track prevention trial with children at high-risk for adolescent conduct problems. *Journal of Abnormal Child Psychology* 2002; 30(1):19–35.

617. Delquadri J, Greenwood C, Whorton D, Carta J, Hall R. Classwide Peer Tutoring. *Exceptional Children* 1986; 52(535–542).
618. Greenwood C, Delquadri J, Hall R. Longitudinal effects of Classwide Peer Tutoring. *Journal of Educational Psychology* 1989; 81(371–384).
619. Heron T, Heward W, Cooke N, Hill D. Evaluation of Classwide Peer Tutoring System: First graders teach each other sight words. *Education and Treatment of Children* 1983; 6(2):137–152.
620. Kohler F, Greenwood C. Effects of collateral peer supportive behaviours within the Classwide Peer Tutoring Program. *Journal of Applied Behavior Analysis* 1990; 23(3):307–322.
621. Sideridis G, Utley C, Greenwood C, Delquadri J, Dawson H, Palmer PR, S. Classwide Peer Tutoring: Effects on the spelling performance and social interactions of students with mild disabilities and their typical peers in an integrated instructional setting. *Journal of Behavior Education* 1997; 7(4):203–212.
622. Toumbourou JW, Gregg ME. Working with families to promote healthy adolescent development. *Family Matters* 2001; 59:54–60.
623. Kacir C, Gordon DA. Interactive videodisk parent training for parents of difficult pre-teens [Unpublished Manuscript]: University of Ohio; 1997.
624. Spoth RL, Redmond C, Kahn JH, Shin C. A prospective validation study of inclination, belief and context predictors of family-focused prevention involvement. *Family Process* 1997; 36:403–429.
625. Jenkin C, Bretherton D. *PACE Parenting Adolescents: A Creative Experience*. Camberwell, Victoria: Australian Council for Educational Research, 1994.
626. Cohen D, Rice J. A parent-targeted intervention for adolescent substance use prevention. Lessons learned. *Evaluation Review* 1995; 19:159–180.
627. Dishion TJ, Kavanagh K. A multilevel approach to family-centred prevention in schools: process and outcome. *Addictive Behaviors* 2000; 25:899–911.
628. Toumbourou JW, Gregg ME, Jenkin C, Holmes S. Symposia paper - Parenting interventions to prevent youth drug abuse. Paper presented at 2nd International Drugs and Young People Conference. Melbourne, 5 April 2001.
629. Bauman KE, Foshee VA, Ennett ST, Pemberton M, Hicks KA, King TS, et al. The influence of a family program on adolescent tobacco and alcohol use. *American Journal of Public Health* 2001; 91(4):604–610.
630. Rohrbach LA, Hodgson CS, Flay BR, Hansen WB, Pentz MA. Parental participation in drug abuse prevention: results from the Midwestern Prevention Project. *Journal of Research on Adolescence* 1994; 4:295–317.
631. Chou C, Montgomery S, Pentz MA, Rohrbach LA, Johnson CA, Flay BR, et al. Effects of a community-based prevention program on decreasing drug use in high-risk adolescents. *American Journal of Public Health* 1998; 88:944–948.
632. Bank L, Marlowe JH, Reid JB, Patterson GR, Weinrott MR. A comparative evaluation of parent-training interventions for families of chronic delinquents. *Journal of Abnormal Child Psychology* 1991; 19:15–33.
633. Blyth A, Bamberg J, Toumbourou J. *Behaviour Exchange Systems Training: A Program for Parents Stressed by Adolescent Substance Abuse*. Camberwell, Australia: Australian Council for Educational Research, 2000.
634. Toumbourou JW, Blyth A, Bamberg J, Forer D. Early impact of the BEST intervention for parents stressed by adolescent substance abuse. *Journal of Community & Applied Social Psychology* 2001; 11:291–304.
635. Bamberg J, Toumbourou JW, Blyth A, Forer D. Profiling changes for families in the BEST program, for parents coping with youth substance abuse. *Australian & New Zealand Journal of Family Therapy* 2001; 22:189–198.
636. Dishion TJ, Andrews DW. Preventing escalation in problem behaviours with high-risk young adolescents: immediate and 1-year outcomes. *Journal of Consulting and Clinical Psychology* 1995; 63:538–548.
637. Bry BH, Catalano RF, Kumpfer KL, Lochman JE, J. S. Scientific findings from family prevention intervention research. In Ashery RS, Robertson EB, Kumpfer KL (eds) *Drug*

- Abuse Prevention through Family Interventions: NIDA Research Monograph 177. Rockville, MD: US Department of Human Services, National Institute on Drug Abuse, 1998;103–129.
638. Szapocznik J, Kurtines WM, Perez-Vidal A, Brickman A, H. FF, Santisteban D, et al. Engaging adolescent drug abusers and their families into treatment: strategic structural systems approach. *Journal of Consulting and Clinical Psychology* 1988; 56:552–557.
639. Liddle HA, Dakof GA. Efficacy of family therapy for drug abuse: promising but not definitive. *Journal of Marital and Family Therapy* 1995; 21:511–543.
640. Santisteban DA, Szapocznik J. Bridging theory, research and practice to more successfully engage substance abusing youth and their families into therapy. *Journal of Child and Adolescent Substance Abuse* 1994; 3:9–24.
641. Stanton MD, Todd TC. *The Family Therapy of Drug Abuse and Addiction*. New York: Guilford Press; 1982.
642. Alexander JF, Parsons BV. *Functional Family Therapy*. Monterey, CA: Brooks and Cole; 2002.
643. Klein NC, Alexander JF, Parsons BV. Impact of family systems intervention on recidivism and sibling delinquency: a model of primary prevention and program evaluation. *Journal of Consulting and Clinical Psychology* 1977; 45:469–474.
644. Aos S, Barnoski R, Lieb R. Preventive programs for young offenders effective and cost-effective. *Overcrowded Times* 1998; 9:7–11.
645. Robbins MS, Alexander JF, Newell RM, Turner CW. The immediate effect of reframing on client attitude in family therapy. *Journal of Family Psychology* 1996; 10:28–34.
646. Borduin CM, Mann BJ, Cone LT, Henggeler SW, Fucci BR, Blaske DM, et al. Multisystemic treatment of serious juvenile offenders: Long-term prevention of criminality and violence. *Journal of Consulting and Clinical Psychology* 1995; 63:569–578.
647. Henggeler SW, Rodick JD, Borduin CM, Hanson CL, Watson SM, Urey JR. Multisystemic treatment of juvenile offenders: effects on adolescent behaviour and family interaction. *Developmental Psychology* 1986; 22:132–141.
648. Henggeler SW, Melton GB, Smith LA. Family preservation using Multisystemic therapy as an effective alternative to incarcerating serious juvenile offenders. *Journal of Consulting and Clinical Psychology* 1992; 60:953–961.
649. Cunningham PB, Henggeler SW. Engaging multiproblem families in treatment: lessons learned throughout the development of Multisystemic Therapy. *Family Process* 1999; 38:265–281.
650. Midford R, Lenton S, Hancock L. *A Critical Review and Analysis: Cannabis Education in Schools*. Sydney: NSW Department of Education and Training, 2000.
651. Midford R, Snow P, Lenton S. *School-based Illicit Drug Education Programs: A Critical Review and Analysis*. Literature review prepared for the Department of Employment, Training and Youth Affairs. Melbourne: Centre for Youth Drug Studies, Australian Drug Foundation, 2001.
652. Botvin GJ, Eli B, Dusenbury L, Botvin EM, Diaz T. Long-term follow-up results of a randomized drug abuse prevention trial in a white middle-class population. *Journal of the American Medical Association* 1995; 273:1106–1112.
653. Hansen WB. School-based substance abuse prevention: a review of the state of the art in curriculum, 1980 - 1990. *Health Education Research* 1992; 7:403–430.
654. White D, Pitts M. Educating young people about drugs: a systematic review. *Addiction* 1998; 93:1475–1487.
655. Dusenbury L, Botvin GJ, James-Ortiz S. The primary prevention of adolescent substance abuse through the promotion of personal and social competence. *Prevention in Human Services* 1990; 7:201–224.
656. Ballard R, Gillespie A, Irwin R. *Principles for Drug Education in Schools*. Belconnen, ACT: University of Canberra, 1994.
657. Coggans N, Watson A. Drug education: approaches, effectiveness and delivery. *Drugs: Education, Prevention and Policy* 1995; 2(3):211–224.
658. Dusenbury L, Falco M. Eleven components of effective drug abuse prevention curricula.

- Journal of School Health 1995; 65(10):420–425.
659. Kelder SH, Perry CL, Klepp KI, Lytle LL. Longitudinal tracking of adolescent smoking, physical activity and food choice behaviour. *American Journal of Public Health* 1994; 87(7):1121–1126.
660. Tobler NS, Lessard T, Marshall D, Ochshorn P, Roona M. Effectiveness of school-based drug prevention programs for marijuana use. *School Psychology International* 1999; 20(1):105–137.
661. Tobler NS, Stratton HH. Effectiveness of school-based drug prevention programs: a meta-analysis of the research. *Journal of Primary Prevention* 1997; 18(1):71–128.
662. Bandura A. *Social Learning Theory*. Englewood Cliffs, N.J.: Prentice Hall; 1977.
663. McGuire WJ. *Constructing Social Psychology: Creative and Critical Processes*. New York: Cambridge University Press; 1976/1999.
664. Botvin GJ, Baker E, Filazzola AD, Botvin EM. A cognitive-behavioural approach to substance abuse prevention: one year follow-up. *Addictive Behaviors* 1990; 15:47–63.
665. Dusenbury L, Falco M, Lake A. A review of the evaluation of 47 drug abuse prevention curricula available nationally. *Journal of School Health* 1997; 67(4):127–132.
666. Botvin GJ, Griffin KW, Diaz T, Scheier LM, Williams C, Epstein JA. Preventing illicit drug use in adolescents: long-term follow-up data from a randomized control trial of a school population. *Addictive Behaviors* 2000; 25(5):769–774.
667. Gorman DM. Do school-based social skills training programs prevent alcohol use among young people? *Addiction Research* 1996; 4(2):191–210.
668. Hansen WB, McNeal RB, Jr. Drug education practice: results of an observational study. *Health Education Research* 1999; 14(1):85–97.
669. Klepp KI, Perry C, Kelder S. Alcohol and marijuana use among adolescents: long-term outcomes of the Class of 1989 Study. *Annals of Behavioural Medicine* 1995; 17(1):19–24.
670. Arkin RM, Roemhild HF, Johnson CA, Luepker RV, Murray DM. The Minnesota smoking prevention program: a seventh-grade health curriculum supplement. *Journal of School Health* 1981; Nov:611–616.
671. Kishchuk N, O’Loughlin J, Paradis S, Masson P, Sacks-Silver G. Illuminating negative results in evaluation of smoking prevention programs. *Journal of School Health* 1990; 60(448–451).
672. Vartiainen E, Fallonen U, McAlister AL, Puska P. Eight-year follow-up results of an adolescent smoking prevention program: the North Karelia youth project. *American Journal of Public Health* 1990; 80:78–79.
673. NHS Centre for Reviews and Dissemination. Preventing the uptake of smoking in young people. *Effective Health Care* 1999; 5:1–12.
674. Thomas R, Bushby K. School based programmes for preventing smoking (Protocol). In *The Cochrane Library*. Oxford: Update Software, 1999.
675. Bruvold WH. A meta-analysis of the California school-based risk reduction program. *Journal of Drug Education* 1990; 20:139–152.
676. Bruvold WH. A meta-analysis of adolescent smoking prevention programs. *American Journal of Public Health* 1993; 83:872–880.
677. Ennett ST, Tobler NS, Ringwalt CI, Flewelling RL. How effective is drug abuse resistance education: a meta-analysis of Projectg CARE outcome evaluations. *American Journal of Public Health* 1994; 84:1394–1401.
678. Rooney BL, Murray DM. A meta-analysis of smoking prevention programs after adjustment for errors in the unit of analysis. *Health Education Quarterly* 1996; 23:48–64.
679. Tobler NS, Roona MR, Ochshorn P, Marshall DG, Streke AV, Stackpole KM. School-based adolescent drug prevention programs: 1998 meta-analysis. *Journal of Primary Prevention* 2000; 20:275–336.
680. Wang LY, Crossett LS, Lowry R, Dent CW, Sussman S. Cost-effectiveness of a school-based tobacco-use prevention program. *Archives of Pediatrics and Adolescent Medicine* 2001; 155:1043–1050.
681. Nutbeam D, Macaskill P, Smith C, Simpson JM, Catford J. Evaluation of two school

- smoking education programs under normal classroom conditions. *British Medical Journal* 1993; 306:102–107.
682. Murray D, Perry C, Griffin G, Harry K, Jacobs DR, Scmid L, et al. Results from a statewide approach to adolescent tobacco use prevention. *Preventive Medicine* 1992; 21:449–472.
683. Caplan M, Weissberg RP, Grober JS, Sivo PJ, Grady K, Jacoby C. Social competence promotion with inner-city and suburban young adolescents: effects on social adjustment and alcohol use. *Journal of Consulting and Clinical Psychology* 1992; 60:56–63.
684. Maggs JL, Schulenberg J. Reasons to drink and not to drink: altering trajectories of drinking through an alcohol misuse prevention program. *Applied Developmental Science* 1998; 2(1):48–60.
685. Bell RM, Ellickson PL, Harrison ER. Do drug prevention effects persist into high school? How project ALERT did with ninth graders. *Preventive Medicine* 1993; 22:463–483.
686. Graham JW, Anderson Johnson C, Hansen WB, B.R. F, Gee M. Drug use prevention programs, gender, and ethnicity: evaluation of three seventh-grade project SMART cohorts. *Preventive Medicine* 1990; 19:305–313.
687. McBride N. School Health and Alcohol Harm Reduction Project: Reducing Alcohol Related Harms in Young People [PhD thesis]. Perth: Curtin University of Technology; 2002.
688. Clayton RR, Cattarello AM, Johnstone BM. The effectiveness of drug abuse resistance education (Project DARE): 5-year follow-up results. *Preventive Medicine* 1996; 25:307–318.
689. Caulkins JP, Rydell CP, Sohler Everingham SM, Chiesa JR, Bushway S. *An Ounce of Prevention, A Pound of Uncertainty: The Cost-Effectiveness of School-Based Drug Prevention Programs*. Santa Monica: RAND Corporation, 1999.
690. Kim S, McLeod J, Shantzis C. An outcome evaluation of Here's Looking at You 2000. *Journal of Drug Education* 1993; 23(1):67–81.
691. Perry CL, Grant M, Ernberg G, Florenzano RU, Langdon MC, Myeni AD, et al. WHO Collaborative Study On Alcohol Education and Young People: Outcomes of a four-country pilot study. *International Journal of the Addictions* 1989; 24:1145–1171.
692. Olweus D. Bully/victim problems among school children: basic facts and effects of a school based intervention program. In Pepler DJ, Rubins KH (eds) *The Development and Treatment of Childhood Aggression*. Hillsdale, NJ: Lawrence Erlbaum Associates, 1991;411–448.
693. Glover S, Burns J, Butler H, Patton GP. Social environments and the emotional well-being of young people. *Family Matters* 1998; 49:11–16.
694. Eggert L, Thompson E, Herting J, Nicholas L, Dicker B. Preventing adolescent drug abuse and high school dropout through an intensive school-based social network development program. *American Journal of Health Promotion* 1994; 8(3):202–215.
695. Hastie PA, Sharpe T. Effects of a sport education curriculum on the positive social behavior of at-risk rural adolescent boys. *Journal of Education for Students Placed at Risk* 1999; 4(8):417–430.
696. Wiist WH, Snider G. Peer education in friendship cliques: prevention of adolescent smoking. *Health Education Research* 1991; 6:101–108.
697. Macri I, Tsiantis J. Effects of a peer led program on smoking prevention: a case example in Greece. *International Quarterly of Community Health Education* 1997; 17:297–308.
698. Dijkstra M, Mester I, de Vries H, van Bruekelen G, Parcel GS. Effectiveness of a social influence approach and boosters to smoking prevention. *Health Education Research* 1999; 14(791–802).
699. Bloor M, Frankland J, Langdon NP, Robinson M, Allerton S, Catherine A. A controlled evaluation of an intensive peer-led, schools-based, anti-smoking programme. *Health Education Journal* 1999; 58:17–25.
700. Koumi I, Tsiantis J. Smoking trends in adolescence: report on a Greek school-based peer-led intervention aimed at prevention. *Health Promotion International* 2001; 16(65–72).

701. Tobler NS. Meta-analysis of 143 adolescent drug prevention programs: Quantitative outcome results of program participants compared to a control or comparison group. *Journal of Drug Issues* 1986; 16:537–567.
702. Wilhelmsen W, Laberg J, Klepp KI. Evaluation of two student and teacher involved alcohol prevention programs. *Addiction* 1994; 89:1157–1165.
703. van Teijlingen ER, Friend JAR, Twine F. Evaluation of Grampian Smokebusters: a smoking prevention initiative aimed at young teenagers. *Journal of Public Health Medicine* 1996; 18:13–18.
704. Snow P, Munro G. Alcohol consumption in amateur Australian football clubs: Evidence from a rural region. *Health Promotion Journal of Australia* 2000; 10(3):237–243.
705. Schinke SP, Orlandi MA, Cole KC. Boys and girls clubs in public housing developments: prevention services for youth at risk. *Journal of Community Psychology* 1992; OSAP Special Issue: 118–128.
706. Tierney JP, Grossman JB, Resch NL. *Making a Difference. An Impact Study of Big Brothers/Big Sisters*. Philadelphia, PA: Public/Private Ventures; 1995.
707. Fors SW, Jarvis S. Evaluation of a peer-led drug abuse risk reduction project for runaway/homeless youths. *Journal of Drug Education* 1995; 25:321–333.
708. Palinkas LA, Atkins CJ, Miller C, Ferreira D. Social skills training for drug prevention in high-risk female adolescents. *Preventive Medicine* 1996; 25:692–701.
709. Hebert EE. Doing something about children at risk. *National Institute of Justice Journal* 1993; Nov:4–9.
710. Bellhouse B, Johnston G. *Good Practice Descriptive Case Studies. Early Intervention for Young People with Drug Problems*. Report prepared by the Australian Drug Foundation. North Melbourne: Department of Human Services, 2002.
711. Furlong MJ, Casa JM, Corral C, Gordon M. Changes in substance use patterns associated with the development of a community partnership project. *Evaluation and Program Planning* 1997; 20:299–305.
712. Cheadle A, Pearson D, Wagner E, Psaty B, Diehr P, Koepsell T. A community based approach to preventing alcohol use among adolescents on an American Indian reservation. *Public Health Reports* 1995; 110:439–447.
713. Schinke SP, Tepavac L, Cole KC. Preventing substance use among Native American youth: three-year results. *Addictive Behaviors* 2000; 25:387–397.
714. Sowden A, Arblaster L. Community interventions for preventing smoking in young people. In *The Cochrane Library, Issue 1*. Oxford: Update Software, 2001.
715. Biglan A, Ary DV, Smolkowski K, Duncan T, Black C. A randomised controlled trial of a community intervention to prevent adolescent tobacco use. *Tobacco Control* 2000; 9:24–32.
716. Baxter AP, Milner PC, Hawkins S, Leaf M, Simpson C, Wilson KV. The impact of heart health promotion on coronary heart disease lifestyle risk factors in school children: lessons learnt from a community-based project. *Public Health* 1997; 111:231–237.
717. Davidson L. *Wensleydale Smokebusters Project Report*. Northallerton: Northallerton Health Authority, 1992.
718. Murray DM, Prokhorov AV, Harty KC. Effects of a statewide antismoking campaign on mass media messages and smoking beliefs. *Preventive Medicine* 1994; 23:54–60.
719. Piper DL, Moberg DP, King MJ. The Healthy for Life Project: behavioural outcomes. *Journal of Primary Prevention* 2000; 21(1):47–73.
720. St Piette TL, Kaltreider DL, Mark MM, Aikin KJ. Drug prevention in a community setting: a longitudinal study of the relative effectiveness of a 3-year primary prevention program in boys and girls clubs across the nation. *American Journal of Community Psychology* 1992; 20:673–706.
721. Sussman S, Dent CW, Stacy AW, Craig S. One-year outcomes of Project Towards No Drug Abuse. *Preventive Medicine* 1998:632–642.
722. Vartiainen E, Paavola M, McAlister A, Puska P. Fifteen-year follow-up of smoking prevention effects in the North Karelia

- Youth Project. *American Journal of Public Health* 1998; 88:81–85.
723. Winkleby MA, Fortmann SP, Rockhill B. Cigarette smoking trends in adolescents and young adults: the Stanford Five-City Project. *Preventive Medicine* 1993; 22:325–334.
724. Gordon I, Whitear B, Guthrie D. Stopping then starting: evaluation of a community-based project to discourage teenage smoking in Cardiff. *Health Education Journal* 1997; 56:42–50.
725. Kaufman JS, Jason LA, Sawlski LM, Halpert JA. A comprehensive multi-media program to prevent smoking among Black students. *Journal of Drug Education* 1994; 24:95–108.
726. Pentz MA, Dwyer JH, MacKinnon DP, Flay BR, Hansen WB, Wang EY, et al. A multicomunity trial for primary prevention of adolescent drug abuse. Effects on drug use prevalence. *Journal of the American Medical Association* 1989; 261:3259–3266.
727. Holder HD, Saltz RF, Grube JW, Voas RB, Gruenewald PJ, Treno A. A community prevention trial to reduce alcohol-involved accidental injury and death: overview. *Addiction* 1997; 92(Suppl. 2):S155–S171.
728. Stevens MM, Freeman DH, Mott LA, Youells FE, Linsey SC. Smokeless tobacco use among children: the New Hampshire study. *American Journal of Preventive Medicine* 1993; 9:160–167.
729. Halpern-Felsher BL, Ozer EM, Millstein SG, Wibbelsmann CJ, Fuster DC, Elster AB, et al. Preventive services in a health maintenance organization: how well do pediatricians screen and educate adolescent parents? *Archives of Pediatrics & Adolescent Medicine* 2000; 154:173–179.
730. Franzgrote M, Ellen JM, Millstein SG, Irwin CE, Jr. Screening for adolescent smoking among primary care physicians in California. *American Journal of Public Health* 1997; 87(8):1341–1345.
731. Schorling JB, Klas PT, Willems JP, Everett AS. Addressing alcohol use among primary care patients: differences between family medicine and internal medicine residents. *Journal of General Internal Medicine* 1994; 9(5):248–254.
732. Ellen JM, Franzgrote M, Irwin CE, Jr, Millstein SG. Primary care physicians' screening of adolescent patients: a survey of California physicians. *Journal of Adolescent Health* 1998; 22(6):433–438.
733. Joffe A, Radius S, Gall M. Health counseling for adolescents: what they want, what they get, and who gives it. *Pediatrics* 1988; 82(3):481–485.
734. Epner JEG, Levenberg PB, Schoeny ME. Primary care providers' responsiveness to health-risk behaviours reported by adolescent patients. *Archives of Pediatrics & Adolescent Medicine* 1998; 152(8):774–780.
735. Blum R, Beuhring T, Wunderlich M, Resnick MD. Don't ask, they won't tell: the quality of adolescent health screening in five practice settings. *American Journal of Public Health* 1996; 86:1767–1772.
736. Klein JD, McNulty M, Flatau CN. Adolescents' access to care: teenagers' self-reported use of services and perceived access to confidential care. *Archives of Pediatrics and Adolescent Medicine* 1998; 152(7):676–682.
737. Britto MT, Rosenthal SL, Taylor J, Passo MH. Improving rheumatologists' screening for alcohol use and sexual activity. *Archives of Pediatrics & Adolescent Medicine* 2000; 154:478–483.
738. Warren CW, Kann L, Small ML, Santelli JS, Collins JL, Kolbe LJ. Age of initiating selected health-risk behaviors among high school students in the United States. *Journal of Adolescent Health* 1997; 21:225–231.
739. Millstein SG, Irwin CE, Jr, Adler NE, Cohn LD, Kegeles SM, Dolcini MM. Health-risk behaviors and health concerns among young adolescents. *Pediatrics* 1992; 3:422–428.
740. Ward JE, Gordon J, Sanson-Fisher RW. Strategies to increase preventive care in general practice. *Medical Journal of Australia* 1991; 154(523–531).
741. Thom B, Tellez C. Detecting and managing alcohol problems in general practice. *British Journal of Addiction* 1986; 81:405–418.
742. Sancu LA, Coffey CMM, Veit FCM, Carr-Gregg M, Patton GC, Day N, et al. Evaluation of the effectiveness of an educational intervention for general practitioners in adolescent health care: randomised controlled trial. *British Medical Journal* 2000; 320:224–230.

743. Paperny DMN, Hedberg VA. Computer-assisted health counselor visits: a low-cost model for comprehensive adolescent preventive services. *Archives of Pediatrics & Adolescent Medicine* 1999; 153(1):63–67.
744. Adger H, Jr. Problems of alcohol and other drug use and abuse in adolescents [Review]. *Journal of Adolescent Health* 1991; 12(8):606–613.
745. Svoen N, Schei E. Adolescent smoking prevention - primary health care in cooperation with local schools. A controlled intervention study. *Scandinavian Journal of Primary Health Care* 1999; 17:54–58.
746. Kottke TE, Battista RN, DeFriese GH, Brekke ML. Attributes of successful smoking cessation interventions in medical practice. A meta-analysis of 39 controlled trials. *Journal of the American Medical Association* 1988; 259:2883–2889.
747. Russell M, Wilson C, Taylor C, Baker C. Effect of general practitioners' advice against smoking. *British Medical Journal* 1979; 2:31–35.
748. Klein JD, Portilla M, Goldstein A, Leininger L. Training pediatric residents to prevent tobacco use. *Pediatrics* 1995; 96:326–330.
749. Hovell MF, Slymen DJ, Jones JA, Hofstetter CR, Burkham-Kreitner S, Conway TL, et al. An adolescent tobacco-use prevention trial in orthodontic offices. *American Journal of Public Health* 1996; 86:1760–1766.
750. Lionis C, Kafatos A, Flachonikolis J, Vakaki M, Tzortzi M, Petraki A. The effects of a health education program among Cretan adolescents. *Preventive Medicine* 1991; 20:685–699.
751. Marlatt AG, Baer JS, Kivlahan DR, Dimeff LA, Larimer ME, Quigley LA, et al. Screening and brief intervention for high-risk college student drinkers: results from a 2-year follow-up assessment. *Journal of Consulting and Clinical Psychology* 1998; 66(4):604–615.
752. Baer JS, Kivlahan DR, Blume AW, McKnight P, Marlatt AG. Brief intervention for heavy-drinking college students: 4-year follow-up and natural history. *American Journal of Public Health* 2001; 91(8):1310–1316.
753. Baer JS, Marlatt GA, Kivlahan DR, Fromme K, Larimer ME, Williams E. An experimental test of three methods of alcohol risk reduction with young adults. *Journal of Consulting and Clinical Psychology* 1992; 60(6):974–979.
754. Rickert VI, Graham CJ, Fisher R, Gottlieb A, Trosclair A, Jay MS. A comparison of methods for alcohol and marijuana anticipatory guidance with adolescence. *Journal of Adolescent Health* 1993; 14:533–539.
755. Oliansky D, Wildenhaus K, Manlove K, Arnold T, Schoener E. Effectiveness of brief interventions in reducing substance use among at-risk primary care patients in three community-based clinics. *Substance Abuse* 1997; 18:95–103.
756. Werch C, Anzalone D, Brokiewicz L, Felker J, Carlson J, Castellon-Vogel A. An intervention for preventing alcohol use among inner city middle-school students. *Archives of Family Medicine* 1996; 5(3):146–152.
757. Catron T, Weiss B. The Vanderbilt school-based counseling program: an interagency, primary-care model of mental health services. *Journal of Emotional and Behavioural Disorders* 1994; 2(4):247–253.
758. Sowden AJ, Arblaster L. Mass media interventions for preventing smoking in young people. In *The Cochrane Library, Issue 4*. Oxford: Update Software, 2001.
759. Hafstad A. Provocative appeals in anti-smoking mass-media campaigns targeting adolescents - the accumulated effect of multiple exposures. *Health Education Research* 1997; 12:227–236.
760. Flay BR, Miller TQ, Hedeker D, Siddiqui O, Britton CF, Brannon BR, et al. The television, school, and family smoking prevention and cessation project VIII. Student outcomes and mediating variables. *Preventive Medicine* 1995; 24:29–40.
761. Flay BR, Hansen WB, Johnson CA, Collins LM, Dent CW, Dwyer KM, et al. Implementation effectiveness trial of a social influences smoking prevention program using schools and television. *Health Education Research* 1987; 2:385–400.
762. Bauman KE, LaPrelle J, Brown JD, Koch GG, Padgett CA. The influence of three mass media campaigns in variables related to adolescent cigarette smoking: results of a

- field experiment. *American Journal of Public Health* 1991; 81:597–604.
763. Flynn BS, Worden JK, Secker-Walker RH, Badger GJ, Geller BM. Cigarette smoking prevention effects of mass media and school interventions targeted to gender and age groups. *Journal of Health Education* 1995; 26:45–51.
764. Flynn BS, Worden JK, Secker-Walker RH, Badger GJ, Geller BM, Costanza MC. Prevention and cigarette smoking through mass media intervention and school programs. *American Journal of Public Health* 1992; 82:827–834.
765. Flynn BS, Worden JK, Secker-Walker RH, Pirie PL, Badger GJ, Carpenter JH, et al. Mass media and school interventions for cigarette smoking prevention: effects 2 years after completion. *American Journal of Public Health* 1994; 84:1148–1150.
766. Worden JK, Flynn BS, Solomon IJ, Secker-Walker RH, Badger GJ, Carpenter JH. Using mass media to prevent cigarette smoking among adolescent girls. *Health Education Quarterly* 1996; 23:453–468.
767. Goldman LK, Glantz SA. Evaluation of antismoking advertising campaigns. *Journal of the American Medical Association* 1998; 279:772–777.
768. Department of Community Services and Health. *The First Twelve Months of the Drug Offensive Campaign against Adolescent Alcohol Abuse*. Unpublished Report. Canberra: Department of Community Services and Health, 1990.
769. Carroll T. *The Role of Social Marketing Campaigns Within Australia's National Drug Strategy*. A Submission to the National Drug Strategy Evaluation 1996. Canberra: Commonwealth Department of Health and Family Services, November 1996.
770. Carroll T, Lum M, Taylor J, Travia J. *Evaluation of the Launch Phase of the National Alcohol Campaign*. Sydney: Government Department of Health and Aged Care, September 2000.
771. Donohew L, Lorch E, Palmgreen P. Sensation seeking and targeting of televised anti-drug PSAs. In Donohew L, Sypher HE, Bukoski WJ (eds) *Persuasive Communication and Drug Abuse Prevention*. New Jersey: Lawrence Erlbaum Associates, 1991;209–226.
772. Carroll T, Taylor J, Lum M. *Evaluation of the Drug Offensive "Speed Catches Up With You" Amphetamines Campaign - 1993-1995*. Sydney: Commonwealth Department of Health and Family Services, 1996.
773. Bertram S, Worsley J, Carroll T. *Evaluation of the launch phase of the National Illicit Drug Campaign*. Research and Marketing Group, Population Health Division, Department of Health and Ageing, 2002. Viewed 25/10/02 2002, <http://www.health.gov.au/pubhlth/publicat/document/reports/nidc_eval_1.pdf>.
774. Carruthers S, McDonald C. The availability of cigarettes to minors in Perth, Western Australia. *Tobacco Control* 1995; 4:49–52.
775. Ludbrook A, Godfrey C, Wyness L, Parrot S, Haw S, Napper M, et al. *Effective and Cost-Effective Measures to Reduce Alcohol Misuse in Scotland: A Literature Review*. Aberdeen: University of York, 2002.
776. Grube JW. Preventing sales of alcohol to minors: results from a community trial. *Addiction* 1997; 92(Suppl. 2):S251–S260.
777. Howell JC, Krisberg B, Hawkins JD, Wilson JJ, eds. *A Sourcebook: Serious, Violent, and Chronic Juvenile Offenders*. New York: Sage Publications; 1995.
778. Commonwealth Department of Education Science and Training. *National Framework for Protocols for Managing the Possession, Use and/or Distribution of Illicit & Other Unsanctioned Drugs in Schools* June 2000.
779. Withers G, Russell J. *Education for Resilience: Prevention & Intervention Strategies for Young People At Risk*. Camberwell, Victoria: Australian Council for Educational Research Press, 2001.
780. Alcohol and other Drugs Council of Australia. *Working towards a national homelessness strategy*, 2001. Viewed 20 November 2001, <www.adca.org.au/submissions/homeless%20strategy.doc>.
781. Bond L, Thomas L, Toumbourou J, Patton G, Catalano RF. *A Profile of Youth in our Community*. Report prepared for the Department of Human Services. Melbourne: Centre for Adolescent Health, 2000.
782. National Crime Prevention - Attorney-General's Department. *Pathways to Prevention -*

- Developmental and Early Intervention Approaches to Crime in Australia - Summary Volume. Canberra: National Crime Prevention - Attorney-General's Department, 1999.
783. Contributors to the Cochrane Collaboration and the Campbell Collaboration. *Evidence from Systematic Reviews of Research Relevant to Implementing the 'Wider Public Health' Agenda*. York: NHS Centre for Reviews and Dissemination, 2000.
784. Commonwealth Department of Health and Aged Care, Australian Institute of Health and Welfare. *National Health Priority Areas Report: Cardiovascular Health*. Canberra: Australian Institute of Health and Welfare, 1999.
785. Commonwealth Department of Health and Aged Care. *Cardiovascular Health: A Report on Heart, Stroke and Vascular Disease. National Health Priority Areas Report Summary*. AIHW Catalogue No. PHE 12. Canberra: Australian Institute of Health and Welfare, 1998.
786. Australian Institute of Health and Welfare. *Heart, Stroke and Vascular Diseases. National Centre for Monitoring Cardiovascular Disease. Catalogue No. CVD 13*. Canberra: Australian Institute of Health and Welfare, 2001.
787. Joint Advisory Group on General Practice and Population Health. *Smoking, Nutrition, Alcohol and Physical Activity (SNAP) Framework for General Practice*. Canberra: Commonwealth Department of Health and Aged Care, June 2001.
788. Commonwealth Department of Health and Aged Care. *Australia's National Tobacco Campaign. Every Cigarette is Doing You Damage, 2000*. Viewed 13 December 2001, <http://www.health.gov.au/pubhlth/publicat/document/tobaccamp_2.pdf>.
789. Commonwealth Department of Health and Aged Care. *Directions in Injury Prevention. Report 2: Injury Prevention Interventions-Good Buys for the Next Decade*. Canberra: Commonwealth of Australia, April 1999.
790. Dinh-Zarr T, Diguseppi C, Heitman E, Roberts I. Preventing injuries through interventions for problem drinking: A systematic review of randomized controlled trials. *Alcohol and Alcoholism* 1999; 34(4):609–621.
791. Gepkens A, Gunning-Schepers LJ. Interventions to reduce socioeconomic health differences. A review of the international literature. *European Journal of Public Health* 1996; 6:218–226.
792. Herrman H. The need for mental health promotion. *Australian and New Zealand Journal of Psychiatry* 2001; 35:709–715.
793. Davis C, Martin G, Kosky R, O'Hanlon A. *Early Intervention in the Mental Health of Young People: A Literature Review*. Department of Health and Aged Care, 2000.
794. Commonwealth Department of Health and Aged Care. *National Action Plan for Promotion, Prevention and Early Intervention for Mental Health*. Canberra: Commonwealth Department of Health and Aged Care, 2000.
795. Commonwealth Department of Health and Aged Care. *Promotion, Prevention and Early Intervention for Mental Health - A Monograph*. Canberra: Commonwealth Department of Health and Aged Care, 2000.
796. Dadds MR. The comorbidity of substance use and emotional disorders: potential for innovative prevention strategies. Paper presented at National Comorbidity Project Workshop, 6–7 March 2000.
797. Hall W, Lynskey M, Teesson M. What is comorbidity and why does it matter? In. Sydney: National Drug and Alcohol Research Centre; 1999.
798. Beyond Blue: the national depression initiative, 2001. Viewed 2 July 2002, <http://www.beyondblue.org.au/site/organisation/annualreport_2001.pdf>.
799. Mitchell P. *Valuing Young Lives: Evaluation of the National Youth Suicide Prevention Strategy*. Melbourne: Australian Institute of Family Studies, 2000.
800. Canterbury Suicide Project. *Bulletin No 9 August 1996*. Review of papers from the study, 1996. Viewed 9 April 2002, <<http://www.chmeds.ac.nz/research/suicide/suicide.htm>>.
801. Beautrais AL. Risk factors for suicide and attempted suicide among young people. *Australian and New Zealand Journal of Psychiatry* 2000; 34:420–436.
802. Neeleman J, Farrell M. Suicide and substance misuse. *British Journal of Psychiatry* 1997; 171:303–304.

803. Mitchell P. *Primary Prevention and Early Intervention*. Technical Report No. 2. Melbourne: Australian Institute of Family Studies, 2000.
804. Gowing LR, Proudfoot H, Henry-Edwards SM, Teesson M. *Evidence Supporting Treatment. The Effectiveness of Interventions for Illicit Drug Use*. Woden: Australian National Council on Drugs, 2001.
805. Commonwealth Government Department of Family and Community Services. *Stronger Families and Communities Strategy*. Canberra: Australian Government Printing Service, 2000.
806. Brown JM. The effectiveness of treatment. In Heather N, Peters TJ, Stockwell T (eds) *International Handbook of Alcohol Dependence and Problems*. Chichester: John Wiley and Sons, 2001;497–508.
807. Proudfoot H, Teesson M. *Investing in Drug and Alcohol Treatment*. Technical Report No. 91. Sydney: National Drug and Alcohol Research Centre, 2000.
808. Gowing LR, Ali R, White J. *The Management of Opioid Withdrawal: An Overview of Research Literature*. Parkside: Drug and Alcohol Services Council, August 2000.
809. Department of Human Services Victoria. *Developing Best Practice Drug and Alcohol Treatment Service and Support Models for Young People of Cambodian, Lao and Vietnamese Origin*. Victoria: Drug Treatment Services, Aged, Community and Mental Health Division, Department of Human Services, May 1998.
810. Alati R. *The Role of Alcohol and Drug Rehabilitation and Treatment amongst Aboriginal People*. Canberra: Commonwealth Department of Human Services and Health, 1996.
811. O'Brien CP, McLellan AT. Myths about the treatment of addiction. *Lancet* 1996; 347:237–240.
812. Stockwell T, Thiagarajan S, McGrath D, Lang E. The measurement of alcohol dependence and impaired control in community samples. *Addiction* 1994; 89:167–174.
813. Silagy C, Mant D, Folwer G, Lancaser T. Nicotine replacement therapy for smoking cessation. In *The Cochrane Library, Issue 3*. Oxford: Update Software, 2000.
814. Heather N. Pleasures and pains of our favourite drug. In Heather N, Peters TJ, Stockwell T (eds) *International Handbook of Alcohol Dependence and Problems*. Chichester: John Wiley and Sons, 2001;5–14.
815. Glaser FB, Heather N, Drummond DC, Finney JW, Lindstrom L, Sutton S, et al. Comments on Project MATCH: matching alcohol treatments to client heterogeneity. *Addiction* 1999; 94(1):31–69.
816. McLellan AT, Hagan TA, Levine M, Gould F, Meyers K, Bencivengo M, et al. Supplemental social services improve outcomes in public addiction treatment. *Addiction* 1998; 93(10):1489–1499.
817. Gossop M, Marsden J, Stewart D. *NTORS At One Year: Changes in Substance Use, Health and Criminal Behaviour One Year After Intake*. London: Department of Health, 1998.
818. Shearer J, Wodak A, Mattick RP, van Beek I, Lewis J, Hall W, et al. *A Randomised Controlled Trial of the Feasibility of Monitoring Controlled Prescribing of Dexamphetamine*. Technical Report No. 75. Sydney: National Drug and Alcohol Research Centre, 1999.
819. Swift W, Copeland J, Lenton S. Cannabis and harm reduction. *Drug and Alcohol Review* 2000; 19(1):101–112.
820. Hannifin J. The ownership debate: cannabis and the concept of cannabism. In Chesher G, Consroe P, Musty R (eds) *Marijuana: An International Research Report, National Campaign Against Drug Abuse, Monograph Series 7*. Canberra: Australian Government Publishing Service, 1988.
821. Miller NS, Gold M. The diagnosis of marijuana (cannabis) dependence. *Journal of Substance Abuse Treatment* 1989; 6:183–192.
822. Miller NS, Gold MS, Pottash AC. A 12-step treatment approach for marijuana dependence. *Journal of Substance Abuse Treatment* 1989; 6:241–250.
823. Grenyer B, Solowij N, Peters R. *A Guide to Quitting Marijuana*. Sydney: National Drug and Alcohol Research Centre; nd.
824. Hancock L, Williams S, Shand D, Quigley A. *Focus: A Guide to Cutting Back on Cannabis*. Perth: Next Step Specialist Drug and Alcohol Services, In preparation 2002.

825. Bleeker A, Malcolm A. *Mulling it Over: Health Information for People Who Use Cannabis*. Sydney: Manly Drug Education and Counselling Centre; 1998.
826. Hancock L, Quigley A, Shand D. Development of a brief intervention for adult cannabis users: eliminating guesswork through a consultative process. Paper presented at Annual Conference of the Australian Professional Society on Alcohol and other Drugs (APSAD). Canberra, 8–10 November 1999.
827. Hulse GK, Tait RJ. Six-month outcomes associated with a brief alcohol intervention for adult in-patients with psychiatric disorders. *Drug and Alcohol Review* 2002; 21:105–112.
828. Ward J, Mattick R, Hall W. *Key Issues in Methadone Maintenance Treatment*. Sydney: National Drug and Alcohol Research Centre; 1992.
829. Mattick RP, Oliphant D, Ward J, Hall W, White J. *The Swiss Scientific Studies of Medically Prescribed Narcotics. The Effectiveness of Other Opioid Replacement Therapies: LAAM, Heroin, Buprenorphine and Naltrexone*. Technical Report No. 43. Sydney: National Drug and Alcohol Research Centre, 1997.
830. Smart RG, Mann RE. The impact of programs for high-risk drinkers on population levels of alcohol problems. *Addiction* 2000; 95(1):37–52.
831. Kristenson H, Ohein H, Hulten-Nosslin MB, Trelle E, Hood B. Identification and intervention of heavy drinking in middle-aged men: results and follow-up of 24–60 months of long-term study with randomized controls. *Alcoholism: Clinical and Experimental Research* 1983; 7(2):203–209.
832. Teesson M, Proudfoot H. Interventions for alcohol dependence, abuse and excessive drinking. Paper presented at National Workshop on Alcohol Research Priorities. Adelaide, March 2001.
833. Weatherburn D, Lind B. Street-level drug law enforcement and entry into methadone maintenance treatment. *Addiction* 2001; 96:577–587.
834. Gerstein DR, Harwood H, Suter N, Malloy K. *Evaluating Recovery Services: The California Drug and Alcohol Treatment Assessment (CALDATA)*. Sacramento: Department of Alcohol and Drug Programs, 1994.
835. Harwood HJ, Hubbard RL, Collins JJ, Rachal JV. The costs of crime and the benefits of drug treatment: a cost-benefit analysis using TOPS data. In Leukefed CG, Tim FM (eds) *Compulsory Treatment of Drug Abuse - Research and Clinical Practice*. Washington DC: National Institute on Drug Abuse, 1988;209–235.
836. Gossop M, Marsden J, Stewart D, Edwards C, Lehmann P, Wilson A, et al. The national treatment outcome research study in the United Kingdom: six month follow-up outcomes. *Psychology of Addictive Behaviors* 1997; 11(4):324–337.
837. Swedish Council on Technology Assessment in Health Care. Treatment of alcohol and drug abuse: an evidence-based review. *International Journal of Technology Assessment in Health Care* 2002; 18(1):145–154.
838. Dwyer T, Pierce JP, Hannam CD, Burke N. Evaluation of the Sydney ‘Quit for Life’ anti-smoking campaign. Part 2: Changes in smoking prevalence. *Medical Journal of Australia* 1986; 144.
839. National Institute of Alcohol Abuse and Alcoholism. Community-based prevention approaches. In *10th Special Report to the US Congress on Alcohol and Health*. Bethesda, MD: National Institute of Alcohol Abuse and Alcoholism, 2000;397–411.
840. Casswell S, Gilmore L. An evaluated community action project on alcohol. *Journal of Studies on Alcohol* 1989; 50(4):339–346.
841. Rhode Island Department of Health. *Final Report of the Rhode Island Community Alcohol Abuse and Injury Prevention Project, Volume I: Description and Process Evaluation*. Providence, RI: Rhode Island Department of Health, 1989.
842. Rhode Island Department of Health. *Final Report of the Rhode Island Community Alcohol Abuse and Injury Prevention Project, Volume II: Statistical Outcome Evaluation*. Providence, RI: Rhode Island Department of Health, 1989.
843. Putnam SL, Rockett IRH, Campbell MK. Methodological issues in community-based alcohol-related injury prevention project: attribution of program effects. In Greenfield TK, Zimmerman R (eds) *Experiences with Community Action Projects: New Research in the Prevention of Alcohol and Other Drug Problems (CSAP)*

- Prevention Monograph 14). Washington, DC: U.S. Government Printing Office, 1993.
844. Stout RL. Prevention experiments in the context of ongoing community processes: opportunities or obstacles for research. In Holder HD, Howard JM (eds) *Community Prevention Trials for Alcohol Problems*. Westport, CT: Praeger, 1992.
845. Cooper M, Midford R, Jaeger J, Hall C. *Partysafe Evaluation Report*. Perth: National Drug Research Institute, Curtin University of Technology, 2001.
846. Aguirre-Molina M, Gorman DM. Community-based approaches for the prevention of alcohol, tobacco, and other drug use. *Annual Review of Public Health* 1996; 17:337–358.
847. Gorman DM, Speer PW. Preventing alcohol abuse and alcohol related problems through community interventions: A review of evaluation studies. *Psychology and Health* 1996; 11:95–131.
848. Wallin E, Norstrom T, Andreasson S. Alcohol prevention targeting licensed premises: a study of effects on violence. *Journal of Studies on Alcohol* 2003; 64(2):270–277.
849. Holder HD, Saltz RF, Grube JW, Treno A, Reynolds RI, Jr, Voas RB, et al. Summing up: lessons from a comprehensive community prevention trial. *Addiction* 1997; 92(Suppl. 2):S293–S301.
850. Midford R, Boots K. COMPARI: insights from a three year community based alcohol harm reduction project. *Australian Journal of Primary Health - Interchange* 1999; 5(46–58).
851. Boots K, Midford R. 'Pick-a-Skipper': an evaluation of a designated driver program to prevent alcohol related injury in a regional Australian city. *Health Promotion International* 1999; 14(4):337–345.
852. Casswell S. A decade of community action research. *Substance Use and Misuse* 2000; 35(1&2):55–74.
853. Mundy J. Grassroots Action. *Connexions* 2000; August–October.
854. Murphy T. NSW Drugs Summit—a view from the other side. *Drug and Alcohol Review* 2000; 19:134–136.
855. Bolleter A, Loxley W. Prevention in action: evaluating the Community Partnerships Initiative. Paper presented at 3rd International Conference on Drugs and Young People. Sydney, 13–15 May 2002.
856. Tobler N. Drug prevention programs can work: research findings. *Journal of Addictive Diseases* 1992; 11(3):1–28.
857. Sciacca J. Peer health education: a powerful yet inexpensive helping strategy. *Peer Facilitator Quarterly* 1987.
858. Holder H, Giesbrecht N. Concepts and issues for community based action to prevent alcohol and other drug related problems. Paper presented at Symposium on Experiences with Community Action Projects for the Prevention of Alcohol and Other Drug Problems. Toronto, 1989.
859. Gray D, Sputore B, Stearne A, Bourbon D, Strempe P. *Indigenous Drug and Alcohol Projects: 1999–2000*. ANCD Research Paper No. 4. Canberra: Australian National Council on Drugs, 2002.
860. Brady M. *Broadening the Base of Interventions for Aboriginal People With Alcohol Problems*. Technical Report No. 29. Sydney: National Drug and Alcohol Research Centre, 1995.
861. Brady M, Hunter E. Talking About Alcohol With Indigenous Patients: A Brief Intervention For Health Professionals. Helping Aboriginal And Torres Strait Islander Patients At Risk Of Alcohol-Related Problems. In. Canberra: Office of Aboriginal and Torres Strait Islander Health, Department of Health and Aged Care; 2001.
862. Hunter E, Brady M, Hall W. *National Recommendations for the Clinical Management of Alcohol-Related Problems in Indigenous Primary Care Settings*. Brisbane: University of Queensland, Australian Institute of Aboriginal and Torres Strait Islander Studies and National Drug and Alcohol Research Centre, 1999.
863. Couzos S, Murray R. *Aboriginal Primary Health Care: An Evidence-Based Approach*. Melbourne: Oxford University Press; 1999.
864. O'Connor R, Associates Pty Ltd. *Report on the Aboriginal Alcohol Treatment/ Rehabilitation Programmes Review and Consultation*. Typescript. Perth: Western Australian Alcohol and Drug Authority, 1988.

865. d'Abbs P. *Responding to Aboriginal Substance Misuse: A Review of Programs Conducted by the Council for Aboriginal Alcohol Program Services (CAAPS), Northern Territory*. Darwin: Northern Territory Drug and Alcohol Bureau, Department of Health and Community Services & Aboriginal and Torres Strait Islander Commission, 1990.
866. Miller K, Rowse T. *CAAAPU (Central Australian Aboriginal Alcohol Programs Unit): An Evaluation*. Menzies Occasional Papers Issue No. 1/95. Darwin: Menzies School of Health Research, 1995.
867. Sputore B, Gray D, Bourbon D, Baird K. *Evaluation of Kununurra-Waringarri Aboriginal Corporation and Ngnowar-Aerwah Aboriginal Corporation's Alcohol Projects*. Perth: National Centre for Research into the Prevention of Drug Abuse, Curtin University of Technology, 1998.
868. Sputore B, Gray D, Sampi C. *Review of the Services Provided by Jungarni-Jutiya Alcohol Action Council Aboriginal Corporation*. Perth: National Drug Research Institute, Curtin University of Technology, 2000.
869. Gray D, Siggers S, Sputore B, Bourbon D. What works? A review of evaluated alcohol misuse interventions among Aboriginal Australians. *Addiction* 2000; 95(1):11–22.
870. Edwards G, Frances R, Lehmann T. *Community Report: Injecting Drug Use Project*. Melbourne: Victorian Aboriginal Health Service Cooperative, 1998.
871. Brady M. *The Grog Book: Strengthening Indigenous Action on Alcohol*. Canberra: Commonwealth Department of Health and Family Services; 1998.
872. Alati R. *Evaluation of the Koori Alcohol and Drug Prevention Project: Final Report*. Melbourne: Koori Health Unit, Victorian Department of Health and Community Services, 1993.
873. Milne C, Josif P, Lynn D. *Raypirri: Evaluation of the Northern Territory Bush tour Project, April-June 1993*. Canberra: Public Affairs Branch, Commonwealth Department of Health, Housing, Local Government and Community Services, 1993.
874. Barber J, Walsh C, R. B. *Alcohol Education for Aboriginal Children*. National Campaign Against Drug Abuse Monograph Series No. 10. Canberra: Government Publishing Service, 1989.
875. Sheehan M, Schonfeld C, Hindson E, Ballard R. Alcohol education in an indigenous community school in Queensland, Australia. *Drugs: Education, Prevention and Policy* 1995; 2:259–273.
876. Gray D, Sputore B, Walker J. Evaluation of an Aboriginal health promotion program: a case study from Karalundi. *Health Promotion Journal of Australia* 1998; 8:24–28.
877. Walley C, James R. Producing culturally appropriate health promotion resources for Aboriginal people. *Aboriginal and Islander Health Worker Journal* 1995; 19(1):6–9.
878. Dale G. Jabby don't smoke: developing resources to address tobacco consumption in remote Aboriginal communities. Paper presented at 11th National Health Promotion Conference: Building Social Capital in the 21st Century. Perth, 1999.
879. Eades D, Ambrose M. Yamatji smoking prevention program. Paper presented at 11th National Health Promotion Conference: Building Social Capital in the 21st Century. Perth, 1999.
880. Johnston F, Beecham R, Dalgleish P, Malpraburr T, Gamaramia G. The Maningrida be smoke free project. *Health Promotion Journal of Australia* 1998; 8(1):12–17.
881. Anonymous. Recommendations from the workshop 'Preventing smoking-related diseases among Aboriginals'. *Aboriginal Health Information Bulletin* 1990; 14:14–15.
882. O'Connor M, Parker E, Mieklejohn B, Oldenburg B, Alati R. Heart health education resources for Aboriginal and Torres Strait Islander communities: the health worker's view. *Aboriginal and Islander Health Worker Journal* 1999; 23(2):20–23.
883. Australian Medical Association, Australian Pharmaceutical Manufacturer's Association. *Indigenous Smoking: Issues and Responses*. Canberra: Australian Medical Association, Australian Pharmaceutical Manufacturer's Association, 2000.
884. San Roque C, in association with, Lefay LB, Cook B, Cook E, et al. *The Western Line Project: A Report to Living with Alcohol: Injartnama Aboriginal Corporation Alcohol, Drugs and Volatile Substances Misuse Prevention Activities*. Typescript. Alice Springs: Injartnama Aboriginal Corporation, 1999.

885. Stojanovski AJ. Mt Theo Story - About Petrol Sniffing: July 1993 Through September 1994. Typescript. Yuendumu 1994.
886. Morice R, Swift H, Brady M. *Petrol Sniffing Among Aboriginal Australians: A Resource Manual*. Adelaide: Western Desert Project, Flinders University of South Australia, 1981.
887. Simpson M. Atyempe: "The Strong Ironwood Tree". The DETOUR Project: A New Learning Place for Aboriginal Youth. Alice Springs: Tangentyere Council, 1995.
888. Burns C, Currie BJ, Clough A, Wuridjal R. Evaluation of strategies used by a remote Aboriginal community to eliminate petrol sniffing. *Medical Journal of Australia* 1995; 163(2):82-86.
889. Lowe HJ, Franks C, Japaltjarri AS. *Rationale and Operation of Petrol Sniffing Prevention Team*. Typescript. Alice Springs 1985.
890. Kirby M, Denihan A, Bruce I, Radic A, Coakley D, Lawlor BA. Benzodiazepine use among the elderly in the community. *International Journal of Geriatric Psychiatry* 1999; 14:280-284.
891. Philips M. Drug testing at work. How does it work? Is it worthwhile? In Midford R, Heale P (eds) *Under the Influence? Issues and Practicalities of Alcohol and Other Drug Testing in the Workplace*. Proceedings of a Forum held in Perth, Western Australia, 8 October 1996. Perth: National Centre for Research into the Prevention of Drug Abuse, 1997;43-60.
892. Bellamy A. Workplace drug testing - the employer's perspective. In Midford R, Heale P (eds) *Under the Influence? Issues and Practicalities of Alcohol and Other Drug Testing in the Workplace*. Proceedings of a Forum held in Perth, Western Australia, 8 October 1996. Perth: National Centre for Research into the Prevention of Drug Abuse, 1997;65-68.
893. Nolan J. Employee drug testing: some recent legal developments. In Allsop S, Phillips M, Calogero C (eds) *Drugs and Work. Responding to Alcohol and Other Drug Problems in the Australian Workplace*. Melbourne: IP Communications, 2001;60-73.
894. Cooke T. Workplace drug testing - the employee's perspective. In Midford R, Heale P (eds) *Under the Influence? Issues and Practicalities of Alcohol and Other Drug Testing in the Workplace*. Proceedings of a Forum held in Perth, Western Australia, 8 October 1996. Perth: National Centre for Research into the Prevention of Drug Abuse, 1997;61-64.
895. Ralph M. Alcohol and other drugs in the workplace - why be concerned? In Midford R, Heale P (eds) *Under the Influence? Issues and Practicalities of Alcohol and Other Drug Testing in the Workplace*. Proceedings of a Forum held in Perth, Western Australia, 8 October 1996. Perth: National Centre for Research into the Prevention of Drug Abuse, 1997;31-42.
896. Holder H. Prevention of alcohol problems in the workplace: a public policy perspective. In Roman PM (ed) *Alcohol Problem Intervention in the Workplace: Employee Assistance Programs and Strategic Alternatives*. New York: Quorum Books, 1990;361-368.
897. Roman PM, Blum TC. The workplace and alcohol problem prevention. *Alcohol Research and Health* 2002; 26:49-57.
898. Midford R. Alcohol and other drugs. In Wyatt A, Oxenburgh M (eds) *Managing Occupational Health and Safety*. Sydney: CCH Australia Ltd, 2003.
899. Ames G. Research and strategies for the primary prevention of workplace alcohol problems. *Alcohol Health and Research World* 1993; 17(1):19-27.
900. Shahandeh B. Drug and alcohol abuse in the workplace: consequences and countermeasures. *International Labour Review* 1985; 124(2):207-223.
901. Trice H. Work-related risk factors associated with alcohol abuse. *Alcohol Health and Research World* 1992; 16(2):106-111.
902. Ames G, Janes C. A cultural approach to conceptualising alcohol and the workplace. *Alcohol Health and Research World* 1992; 16(2):112-119.
903. Corry A. Controls on drug use. In Allsop S, Phillips M, Calogero C (eds) *Drugs and Work. Responding to Alcohol and Other Drug Problems in the Australian Workplace*. Melbourne: IP Communications, 2001;105-144.
904. Makkai T. *Drug Use Monitoring in Australia (DUMA): Drug Detection Testing*. AIC Research and Public Policy Series No. 25. Canberra: Australian Institute of Criminology, 2000.
905. Lewis J. *Drug Detection and its Role in Law Enforcement*. Trends and Issues in Crime and

- Criminal Justice Series Report No. 205. Canberra: Australian Institute of Criminology, May 2001.
906. Moskowitz H, Robinson CD. *Effects of Low Doses of Alcohol on Driving Related Skills: A Review of the Evidence*. Washington, DC: National Highway Traffic Safety Administration, 1988.
907. Baker T. The plutonic gold experience. In Midford R, Heale P (eds) *Under the Influence? Issues and Practicalities of Alcohol and Other Drug Testing in the Workplace. Proceedings of a Forum held in Perth, Western Australia, 8 October 1996*. Perth: National Centre for Research into the Prevention of Drug Abuse, 1997;69–76.
908. Allsop S, Phillips M. An overview of drug testing in the workplace - key note address. In Midford R, Heale P (eds) *Under the Influence? Issues and Practicalities of Alcohol and Other Drug Testing in the Workplace. Proceedings of a Forum held in Perth, Western Australia, 8 October 1996*. Perth: National Centre for Research into the Prevention of Drug Abuse, 1997;1–18.
909. Tinelli G, Hamlett L, Smithson M. Fit for duty... or is it? *The Voice* 1999;20–21, 27–28, 30.
910. Kinder B, Pape N, Walfish S. Drug and alcohol education: a review of outcome studies. *International Journal of the Addictions* 1980; 15:1035–1054.
911. Shain M. Alternatives to drug testing: employee assistance and health promotion programs. In McDonald S, Roman PM (eds) *Research Advances in Alcohol and Drug Problems, Volume 11, Drug Testing in the Workplace*. New York: Plenum Press, 1994;257–277.
912. McVey D, Stapleton J. Can anti-smoking television advertising affect smoking behaviour? Controlled trial of the Health Education Authority for England's anti-smoking TV campaign. *Tobacco Control* 2000; 9:273–282.
913. Boots K, Midford R. Mass media marketing and advocacy to reduce alcohol-related harm. In Heather N, Peters TJ, Stockwell T (eds) *International Handbook of Alcohol Dependence and Problems*. Chichester: John Wiley and Sons, 2001;805–822.
914. Hastings G, Haywood A. Social marketing and communication in health promotion. *Health Promotion International* 1991; 6(2):135–145.
915. Egger G, Donovan R, Spark R. *Health and the Media: Principles and Practices for Health Promotion*. Sydney: McGraw Hill; 1993.
916. Backer TE, Rodgers EM, Sopory P. *Designing Health Communication Programs: What Works?* Newbury Park, CA: Sage Publications; 1992.
917. Montagne M, Scott DM. Prevention of substance use problems: models, factors and processes. *International Journal of the Addictions* 1993; 28:1177–1208.
918. Pierce JP, Dwyer T, Frape G, Chapman S, Chamberlain A, Burke N. Evaluation of the Sydney "Quit for Life" anti-smoking campaign. Part I. Achievement of intermediate goals. *Medical Journal of Australia* 1986; 144:341–344.
919. Pierce JP, Macaskill P, Hill D. Long-term effectiveness of mass media led anti-smoking campaigns in Australia. *American Journal of Public Health* 1990; 80:565–569.
920. Hassard K. *Australia's National Tobacco Campaign: Evaluation Report Volume One*. Canberra: Commonwealth Department of Health and Aged Care, 2000.
921. Hassard K. *Australia's National Tobacco Campaign: Evaluation Report Volume Two*. Canberra: Commonwealth Department of Health and Aged Care, 2000.
922. Holder HD, Treno AJ. Media advocacy in community prevention: news as a means to advance policy change. *Addiction* 1997; 92(2):S189–S199.
923. Strunge H. Danish experiences of national campaigns on alcohol, 1990-1996. *Drugs: Education, Prevention and Policy* 1998; 5(1):73–79.
924. Carroll T. Australia's National alcohol education and risk awareness campaign: Generating a focus and creating opportunities. In. Brisbane: Commonwealth Department of Human Services and Health; 1995.
925. Cameron M, Newstead S. Mass media publicity supporting police enforcement and its economic value. Paper presented at Public Health Association of Australia 28th Annual Conference Symposium on Mass Media Campaigns in Road Safety, 30 September 1996.

926. Plant A, Macaskill P, Lo SK, Pierce JP. Report of the Evaluation of the Anit-heroin Campaign. Conducted by the National Campaign Against Drug Abuse. Sydney: Department of Public Health, University of Sydney, 1988.
927. National Drugs Campaign: Campaign outline. Department of Health and Ageing, nd. Viewed 28/10/02 2002, <<http://www.drugs.health.gov.au/media/campaign.htm>>.
928. Bertram S, Worsley J, Carroll T. Evaluation of the Launch Phase of the National Illicit Drugs Campaign. Chapter 1: Overview. Research Report. Sydney: Government Department of Health and Ageing, January 2002.
929. DeJong W. College students' use of designated drivers: the data are in. *Prevention Pipeline* 1997; Nov/Dec(25–27).
930. Wallack L. Two approaches to health promotion in the mass media. *World Health Forum* 1990; 11:143–164.
931. Wallack L, Dorfman L, Jernigan D, Themba M. *Media Advocacy and Public Health—Power for Prevention*. Newbury Park, CA: Sage Publications; 1993.
932. Erickson A, Ricks A, McKenna J, Romano R. Past lessons and new uses of the media in reducing tobacco consumption. *Public Health Reports* 1990; 105:244–257.
933. Chapman S, Lupton D. *The Fight for Public Health—Principles and Practice of Media Advocacy*. London: British Medical Journal Publishing Group; 1994.
934. Hawks D. Not Much to Ask for, Really! The Introduction to Standard Drink Labelling in Australia. In; 1996.
935. Stockwell T, Single E. Standard unit labelling of alcohol containers. In Plant M, Single E, Stockwell T (eds) *Alcohol. Minimising the Harm. What Works?* London: Free Association Press, 1997;85–104.
936. Holder HD. Mass communication as an essential aspect of community prevention to reduce alcohol-involved traffic crashes. *Alcohol, Drugs and Driving* 1994; 10:295–307.
937. National Health and Medical Research Council. *Is there a Safe Level of Daily Consumption of Alcohol for Men and Women?* 1st edition. Canberra: Australian Government Printing Services, 1987.
938. National Health and Medical Research Council. *Is there a Safe Level of Daily Consumption of Alcohol for Men and Women?* 2nd edition. Canberra: Australian Government Printing Services, 1992.
939. Collins DJ, Lapsley HM. *The Social Costs of Drug Abuse in Australia in 1988 and 1992*. Canberra: Commonwealth Department of Human Services and Health, 1996.
940. Stockwell T, Beel A. *Public Support for the Introduction of Standard Drink Labels on Alcohol Containers*. Perth: National Centre for Research into the Prevention of Drug Abuse, Curtin University of Technology, 1994.
941. National Food Authority. *A Guide to Meeting the New Standard Drink Labelling Requirement for Alcoholic Beverages*. Canberra: National Food Authority, 1995.
942. Australian Institute of Health and Welfare. *2001 National Drug Strategy Household Survey: State and Territory Supplement. Drug Statistics Series 10*. Canberra: Australian Institute of Health and Welfare, 2002.
943. Greenfield TK, Graves K, Kaskutas L. Alcohol warning labels for prevention: national survey findings. *Alcohol Health and Research World* 1993; 17:67–75.
944. U.S. Department of Health and Human Services. *Reducing Tobacco Use: A Report of the Surgeon General*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2000.
945. Chaloupka FJ. Macro-social influences: The effects of prices and tobacco control policies on the demand for tobacco products. *Nicotine and Tobacco Research* 1999; 1(S1):S105–109.
946. Borland R, Hill D. Initial impact of the new Australian tobacco health warnings on knowledge and beliefs. *Tobacco Control* 1997; 6(4):317–325.
947. Wyllie A, Zhang JF, Casswell S. Positive responses to televised beer advertisements associated with drinking and problems reported by 18 to 29 -year-olds. *Addiction* 1998; 93:749–760.
948. Wyllie A, Zhang J-F, Casswell S. Responses to televised alcohol advertisements

- associated with drinking behaviour of 10-17-year-olds. *Addiction* 1998; 93:361–372.
949. Grube JW, Nygaard P. Adolescent drinking and alcohol policy. *Contemporary Drug Problems* 2001; 28:87–131.
950. World Health Organization. *Report of Technical Advisory Group on Alcohol Promotions and Young People*. Valencia, Spain 7–10 May In preparation 2002.
951. Geller ES, Kalsher MJ, Clarke SW. Beer versus mixed drink consumption at fraternity parties: a time and place for low-alcohol alternatives. *Journal of Studies on Alcohol* 1991; 52:197–203.
952. Plant M, Single E, Stockwell T, eds. *Alcohol: Minimising the Harm. What Works?* London; New York: Free Association Books Ltd; 1997.
953. Solomon R, Payne J. Alcohol liability in Canada and Australia: sell, serve and be sued. *Tort Law Review* 1996; 4(3):188–241.
954. Gruenewald P, Stockwell T. Availability policy and the reduction of alcohol-related harm. In: *Alcohol and Public Policy Project*, WHO. Berkeley; 2001.
955. Alcohol and other Drugs Council of Australia. *Drug Policy 2000: A New Agenda for Harm Reduction: Alcohol and other Drugs Council of Australia*, June 2000.
956. Stockwell T, Single E. Reducing harmful drinking. In Stanton P, Grant M (eds) *Alcohol and Pleasure. A Health Perspective*. Philadelphia: Taylor and Francis, 1999;357–373.
957. Saltz RF. Prevention where alcohol is sold and consumed: server intervention and responsible beverage service. In Plant M, Single E, Stockwell T (eds) *Alcohol: Minimising the Harm. What Works?* New York: Free Association Books Ltd, 1997;72–84.
958. Graham K, Homel R. Creating safer bars. In Single E, Stockwell T (eds) *Alcohol: Minimising the Harm. What Works?* New York: Free Association Books Ltd, 1997;171–192.
959. Osterberg E. Effects of price and taxation. In Heather N, Peters TJ, Stockwell T (eds) *International Handbook of Alcohol Dependence and Problems*. Chichester: John Wiley and Sons, 2001;685–698.
960. McKnight AJ, Voas RB. Prevention of alcohol-related road crashes. In Heather N, Peters TJ, Stockwell T (eds) *International Handbook of Alcohol Dependence and Problems*. Chichester: John Wiley and Sons, 2001;741–770.
961. Treno AJ, Holder HD. Prevention at the local level. In Heather N, Peters TJ, Stockwell T (eds) *International Handbook of Alcohol Dependence and Problems*. Chichester: John Wiley and Sons, 2001;771–784.
962. Stockwell T, Dietze P, Chikritzhs T, Catalano P, Heale P. How much alcohol is drunk in Australia in excess of the new Australian alcohol guidelines? Letter to the Editor. *Medical Journal of Australia* 2002; 176(2):91–92.
963. Norstrom T, Skog O-J. Alcohol and mortality: methodological and analytical issues in aggregate analyses. *Addiction* 2001; 96 Suppl 1:S5–S17.
964. Chikritzhs T, Jonas H, Heale P, Dietze P, Hanlin K, Stockwell T. *Alcohol-Caused Deaths and Hospitalisations in Australia, 1990-1997*. National Alcohol Indicators Project Bulletin No. 1. Perth: National Drug Research Institute, Curtin University of Technology, 1999.
965. Catalano P, Chikritzhs T, Stockwell T, Webb M, Rohlin C-J, Dietze P. Trends in Per Capita Alcohol Consumption in Australia, 1990/91 - 1998/99. National Alcohol Indicators Project Bulletin No. 4. Perth: National Drug Research Institute, Curtin University of Technology, May 2001.
966. Stockwell T. Alcohol policy, harm reduction and the prevention paradox. *Journal of Health Promotion for Northern Ireland* 2001; 15:22–25.
967. Gruenewald PJ, Stockwell T, Beel A, Dyskin E. Beverage sales and drinking and driving: the role of on-premise drinking places. *Journal of Studies on Alcohol* 1999; 60(1):47–53.
968. Stockwell T, Masters L, Philips M, Daly A, Gahegan M, Midford R, et al. Consumption of different alcoholic beverages as predictors of local rates of night-time assault and acute alcohol-related morbidity. *Australian and New Zealand Journal of Public Health* 1998; 22(2):237–242.
969. Godfrey C. Can tax be used to minimise harm? A health economist's perspective. In Plant M, Single E, Stockwell T (eds) *Alcohol. Minimising the Harm. What Works?* London: Free Association Books Ltd, 1997;29–42.

970. Casswell S. Population level policies on alcohol: are they still appropriate given that "alcohol is good for the heart"? *Addiction* 1997; 92(S1):S81–S90.
971. Beel A, Stockwell T. *The Introduction of 0.05 Legislation in Western Australia: A Preliminary Research Report*. Perth, Western Australia: National Centre for Research into the Prevention of Drug Abuse, Curtin University of Technology, 1993.
972. Chikritzhs T, Stockwell T. The impact of later trading hours for Australian public houses (hotels) on levels of violence. *Journal of Studies on Alcohol* 2002; 63(5):591–599.
973. Briscoe S, Donnelly N. *Assaults on Licensed Premises in Inner-Urban Areas*. Report No. 2. Sydney: NSW Bureau of Crime Statistics and Research and the National Drug Research Institute, October 2001.
974. Ragnarsdóttir T, Kjartansdóttir A, Davíðsdóttir S. Effect of extended alcohol serving hours in Reykjavík. In Room R (ed) *The Effects of Nordic Alcohol Policies*. Helsinki: Nordic Council for Alcohol and Drug Research, 2002; 145–154.
975. Catalano P, Stockwell TR. *Driving After Drinking in Western Australia*. Perth: National Drug Research Institute, Curtin University of Technology, 2002.
976. Hauritz M, Homel R, McIlwain G, Burrows T, Townsley M. Reducing violence in licensed venues through community safety action projects: the Queensland experience. *Contemporary Drug Problems* 1998; 25:511–551.
977. Braithwaite J. The new regulatory state and the transformation of criminology. *British Journal of Criminology* 2000; 40:222–238.
978. Bourbon D, Siggers S, Gray D. *Indigenous Australians and Liquor Licensing Legislation*. Perth: National Centre for Research into the Prevention of Drug Abuse, Curtin University of Technology, 1999.
979. Gray D, Drandich M, Moore L, Wilkes T, Riley R, Davies S. Aboriginal well-being and liquor licensing legislation in Western Australia. *Australian Journal of Public Health* 1995; 19(2):177–185.
980. d'Abbs P. Restricted areas and Aboriginal drinking. In Vernon J (ed) *Alcohol and Crime: Proceedings of a Conference Held 4–6 April 1989*. Canberra: Australian Institute of Criminology, 1990.
981. Larkins KP, McDonald DN. Recent Northern Territory liquor control initiatives. *Australian Alcohol/Drug Review* 1984; 3:263–271.
982. Douglas M. Restrictions of the hours of sale in a small community: a beneficial impact. *Australian and New Zealand Journal of Public Health* 1998; 22(6):714–719.
983. d'Abbs P, Togni S. *The Derby Liquor Licensing Trial: A Report on the Impact of Restrictions on Licensing Conditions between 12 January 1997 and 12 July 1997*. Darwin: Menzies School of Health Research, 1997.
984. d'Abbs P, Togni S, Crundall I. *The Tennant Creek Liquor Licensing Trial, August 1995 - February 1996: An Evaluation (Revised Edition)*. Darwin: Menzies School of Health Research and NT Living With Alcohol Program, June 1996.
985. Gray D, Siggers S, Atkinson D, Sputore B, Bourbon D. Beating the grog: an evaluation of the Tennant Creek liquor licensing restrictions. *Australian and New Zealand Journal of Public Health* 2000; 24(1):39–44.
986. d'Abbs P, Togni S, Stacey N, Fitz J. *Alcohol Restrictions in Tennant Creek: A Review Prepared for the Beat the Grog Committee, Tennant Creek, Northern Territory*. Darwin: Menzies School of Health Research, 2000.
987. d'Abbs P, Togni S, Duquemin A. *Evaluation of Restrictions on the Sale of Alcohol from Curtin Springs Roadside Inn, Northern Territory*. A Report Prepared for the Office for Aboriginal and Torres Strait Islander Health. Darwin: Menzies School of Health Research, 1998.
988. d'Abbs P, Togni S. Liquor licensing and community action in regional and remote Australia: a review of recent initiatives. *Australian and New Zealand Journal of Public Health* 2000; 24(1):45–53.
989. Gray D. Indigenous Australians and liquor licensing restrictions (invited and refereed editorial). *Addiction* 2000; 95(10):1469–1472.
990. Brady M. Indigenous and government attempts to control alcohol use among Australian Aborigines. *Contemporary Drug Problems* 1990; 17(2):195–220.
991. Brady M, Palmer K. *Alcohol in the Outback: Two Studies in Drinking*. Darwin: North Australia

- Research Unit, Australian National University, 1984.
992. Martin DF. *The Supply of Alcohol in Remote Aboriginal Communities: Potential Policy Directions from Cape York*. Discussion paper No. 162/1998. Canberra: Centre for Aboriginal Economic Policy Research, Australian National University, 1998.
993. d'Abbs P. Out of sight, out of mind? Licensed clubs in remote Aboriginal communities. *Australian and New Zealand Journal of Public Health* 1998; 22(6):679–684.
994. Health Insurance Commission. *About the Pharmaceuticals Benefit Scheme (PBS) - About Doctor Shopping*, 2001. Viewed 3 June 2002, <http://www.hic.gov.au/yourhealth/our_services/apbs/doctorshop.htm>.
995. Dobbin M. The Victorian temazepam injection prevention initiative. *Health of Victorians. The Chief Health Officer's Bulletin*, 2002. Viewed 21 May 2002, <<http://www.health.vic.gov.au/chiefhealthofficer/downloads/vol2no1jan2002/temazepam.pdf>>.
996. Dobbin M. *Temazepam Injecting In Victoria 2001. Discussion Paper*. Melbourne: Department of Human Services, Victoria, November 2001.
997. Drugs and Crime Prevention Committee. *Inquiry into the Inhalation of Volatile Substances*. Melbourne: Parliament of Victoria, January 2002.
998. Grasmick HG, Bursik RJ. Conscience, significant others, and rational choice: Extending the deterrence model. *Law and Society Review* 1990; 24(3):837–861.
999. Braithwaite V. *The Community Hopes, Fears and Actions Survey: Goals and Measures*. Working Paper No. 2. Canberra: Centre for Tax System Integrity, Research School of Social Sciences, The Australian National University, 2001.
1000. Makkai T, Braithwaite J. Reintegrative shaming and compliance with regulatory standards. *Criminology* 1994; 32(3):361–385.
1001. MacCoun RJ. Drugs and the law: A psychological analysis of drug prohibition. *Psychological Bulletin* 1993; 113(3):487–512.
1002. Schneider AL, Ervin L. Specific deterrence, rational choice, and decision heuristics: Applications in juvenile justice. *Social Science Quarterly* 1990; 71(3):584–601.
1003. Weatherburn D, Jones C. *Does Prohibition Deter Cannabis Use? Contemporary Issues in Crime and Justice Bulletin No. 58*. Sydney: NSW Bureau of Crime Statistics and Research, August 2001.
1004. Ali R, Christie P, Lenton S, Hawks D, Sutton A, Hall W, et al. *The Social Impacts of the Cannabis Expiation Notice Scheme in South Australia – Summary Report*. Monograph No. 34. Canberra: Publications Productions Unit, Commonwealth Department of Health and Aged Care, National Drug Strategy, 1999.
1005. Stafford MC, Warr M. A reconceptualization of general and specific deterrence. *Journal of Research in Crime and Delinquency* 1993; 30(2):125–135.
1006. Caulkins JP. *Law Enforcement's Role in a Harm Reduction Regime*. Contemporary Issues in Crime and Justice Bulletin No. 64. Sydney: New South Wales Bureau of Crime Statistics and Research, January 2002.
1007. Dunworth T, Mills G. *National Evaluation of Weed and Seed*. National Institute of Justice, USA, 1999. Viewed 6 June 2003, <<http://www.ojp.usdoj.gov/nij/pubs-sum/176358.htm>>.
1008. Mazerolle LG, Price JF, Roehl J. Civil remedies and drug control: a randomized field trial in Oakland, California. *Evaluation Review: A Journal of Applied Social Research* 2000; 24(2):212–241.
1009. Jacobson J. *Policing Drug Hot-Spots*. Police Research Series Paper 109. London: Policing and Reducing Crime Unit, Home Office, 1999.
1010. Weisburd D, Green L. Policing drug hot-spots: findings from the Jersey City DMA Experiment. *Justice Quarterly* 1995; 12(4):711–735.
1011. Williams P, White P, Teece M, Kitto R. *Problem-oriented Policing: Operation Mantle - A Case Study*. Trends and Issues in Crime and Criminal Justice Series Report No. 190. Canberra: Australian Institute of Criminology, February 2001.

1012. Graycar A, Nelson D, Palmer M. *Law Enforcement and Illicit Drug Control*. Trends and Issues in Crime and Criminal Justice Series Report No. 110. Canberra: Australian Institute of Criminology, April 1999.
1013. Maher L, Dixon D, Swift W, Nguyen T. *Anh hai: Young Asian Background People's Perceptions and Experiences of Policing*. Sydney: University of New South Wales Faculty of Law, 1997.
1014. Grapendaal M, Leuw E, Nelen H. *A World of Opportunities: Life-Style and Economic Behavior of Heroin Addicts in Amsterdam*. Albany, NJ: State University of New York Press, 1995.
1015. Dixon D, Coffin P. Zero tolerance policing of illegal drug markets. *Drug and Alcohol Review* 1999; 18:477–486.
1016. Braga A. The effects of hot spots policing on crime. In Heston AW, Weiner NA, Farrington D, Welsh BC (eds) *The Annals of The American Academy of Political and Social Science. What Works in Preventing Crime? Systematic Reviews of Experimental and Quasi-experimental Research*. Thousand Oaks: Sage Publications, 2001; 104–125.
1017. Ratcliffe J. *Burglary Reduction and the Myth of Displacement*. Trends and Issues in Crime and Criminal Justice Series No. 232. Canberra: Australian Institute of Criminology, 2002.
1018. Green L. *Policing Places with Drug Problems*. Thousand Oaks: Sage Publications; 1996.
1019. Commonwealth Department of Health and Ageing. National illicit drug strategy "Tough on drugs". Population Health Division, 2001. Viewed 25 June 2002, <<http://www.health.gov.au/pubhlth/strateg/drugs/illicit/index.htm>>.
1020. Commonwealth Department of Health and Aged Care. *National Action Plan on Illicit Drugs 2001 to 2002-03*. Canberra: Commonwealth of Australia, July 2001.
1021. Australian National Audit Office. *Drug Detection in Air and Containerised Sea Cargo and Smallcraft*. Canberra: ANAO, 2002.
1022. Australian Federal Police. *National Illicit Drug Strategy Initiatives November 1997–April 2001. Second Edition*. Canberra: Australian Federal Police, 2001.
1023. Australian Customs Service. *Australian Customs Service Annual Report 2000-01*. Canberra: Commonwealth of Australia, 2001.
1024. McFadden M, Mwesigya S-E. Estimating the economic value of AFP fraud and drug investigations. *Platypus Magazine*, 2001. Viewed 25 June 2002, <<http://www.afp.gov.au/raw/Publications/Platypus/Dec01/ecvalue.pdf>>.
1025. Bush WM. The Australian heroin drought: the case for an inquiry into its causes and the flood of methamphetamines, 2002. Viewed 3 February 2002, <<http://www.ffdlr.org.au/commentary/HeroinDrought.PDF>>.
1026. Weatherburn D, Jones C, Freeman K, Makkai T. *The Australian Heroin Drought and its Implications for Drug Policy* No. 59. Sydney: NSW Bureau of Crime Statistics and Research, October 2001.
1027. Topp L, Degenhardt L, Day C. *The Causes, Effects and Implications of the Heroin Shortage in the ACT, NSW and Victoria*. Sydney: National Drug and Alcohol Research Centre, December 2001.
1028. Commonwealth Department of Health and Ageing. *National Drug Law Enforcement Research Fund Grants List*. April 2002.
1029. Brooks A, Stathard C, Moss J, Christie P, Ali R. *Costs Associated with the Operation of the Cannabis Expiation Notice Scheme in South Australia*. Adelaide: Drug and Alcohol Services Council, 1999.
1030. Makkai T, McAllister I. *Marijuana in Australia: Patterns and attitudes*. Canberra: Australian Government Publishing Service, 1997.
1031. Victoria Police Strategic Development Department. *Evaluation of the Cannabis Cautioning Program Pilot*. 1998.
1032. Ditchburn P. Cannabis Cautioning Program and the Drug Diversion Pilot - Victoria Police. Paper presented at Australasian Conference on Drug Strategy. Adelaide, 27 – 29 April 1999.
1033. McAllister I, Makkai T. Antisocial behaviour among young Australians while under the influence of illicit drugs. *Australian and New Zealand Journal of Criminology* 2003; 36(2): 211–222.
1034. Australian Police Ministers Council. *National Supply Reduction Strategy for Illicit Drugs*. June 2002.
1035. United Nations International Drug Programme. *World Drug Report*. Oxford: Oxford University Press; 1997.

1036. Government of Western Australia. Office of the Director of Public Prosecutions Western Australia. *Annual Report 2000/2001*. Perth: Government of Western Australia, 2001.
1037. Australian Law Reform Commission. Confiscation that counts: a review of the Proceeds of Crime Act 1987. Australasian Legal Information Institute, 1999. Viewed 25 June 2002, <<http://www.austlii.edu.au/au/other/alrc/publications/reports/87/>>.
1038. Moore MH. Policies to achieve discrimination on the effective price of heroin. *The American Economic Review* 1973; 63:270–277.
1039. Moore MH. Supply reduction and drug law enforcement. In Tonry M, Wilson JQ (eds) *Drugs and Crime. Crime and Justice: A Review of the Research*. Chicago: University of Chicago Press, 1990;109–157.
1040. Reuter P. Can the borders be sealed? In Weisheit R (ed) *Drugs, Crime and the Criminal Justice System*. Cincinnati, OH: Anderson Publishing Co. and Academy of Criminal Justice Sciences, 1990;13–26.
1041. Reuter P. *The Limits of Supply-Side Drug Control*. Santa Monica: RAND Corporation, 2001.
1042. Green P, Purnell I. *Measuring the Success of Law Enforcement Agencies in Australia in Targeting Major Offenders Relative to Minor Offenders*. Adelaide: National Police Research Unit, 1995.
1043. Weatherburn D, Lind B. *Drug Law Enforcement Policy and its Impact on the Heroin Market*. Sydney: New South Wales Bureau of Crime Statistics and Research, 1995.
1044. Sutton A, James S. *Evaluation of Australian Drug and Anti-trafficking Law Enforcement*: National Police Research Unit, 1996.
1045. Weatherburn D. *Performance Indicators for Drug Law Enforcement*. Crime and Justice Bulletin No. 48. Sydney: New South Wales Bureau of Crime Statistics and Research, February 2000.
1046. New South Wales Police. *NSW Illicit Drug Law Enforcement Performance Indicators*. Sydney: Organisational Policy and Development, NSW Police, April 2002.
1047. Makkai T. *Linking Drugs and Criminal Activity: Developing an Integrated Monitoring System*. Trends and Issues in Crime and Criminal Justice Series Report No. 109. Canberra: Australian Institute of Criminology, April 1999.
1048. Makkai T, McAllister I. Measuring social indicators in opinion surveys: a method to improve accuracy on sensitive questions. *Social Indicators Research* 1992; 27:169–186.
1049. Makkai T. Statistical systems: Crime. In Smelser NJ, Baltes PB (eds) *International Encyclopedia of the Social and Behavioral Sciences*: Elsevier Science Ltd, 2001;15053–15056.
1050. Spooner C, Hall W, Mattick R. *A Strategic Overview of the Diversion of Drug-Related Offenders in NSW*. Technical Report No. 96. Sydney: National Drug and Alcohol Research Centre, June 2000.
1051. Thurman QC, Giacomazzi A, Bogen P. Research note: cops, kids, and community policing - an assessment of a community policing demonstration project. *Crime and Delinquency* 1993; 39(4):554–564.
1052. Morehouse E, Tobler N. Preventing and reducing substance use among institutionalised adolescents. *Adolescence* 2000; 35(137):1–28.
1053. Dembo R, Shemwell M, Guida J, Schmeidler J, Pacheco K, Seeberger W. A longitudinal study of the impact of a family empowerment intervention on juvenile offender psychosocial functioning: a first assessment. *Journal of Child and Adolescent Substance Abuse* 1998; 8(1):15–54.
1054. Spooner C, Hall W, Mattick R. An overview of diversion strategies for Australia drug-related offenders. *Drug and Alcohol Review* 2001; 20:281–294.
1055. Ministerial Council on Drug Strategy. *COAG Illicit Drug Diversion Initiative: Report to Heads of Government* 2001.
1056. Howells K, Day A. *The Rehabilitation of Offenders: International Perspectives Applied to Australian Correctional Systems*. Trends and Issues in Crime and Criminal Justice No. 112. Canberra: Australian Institute of Criminology, 1999.
1057. Hall W. The role of legal coercion in the treatment of offenders with alcohol and heroin problems. *Australian and New Zealand Journal of Criminology* 1997; 30:103–120.
1058. Porter L, Arif A, Curran W. *The Law and the Treatment of Drug and Alcohol Dependent Persons - A*

- Comparative Study of Existing Legislation. Geneva: World Health Organization, 1986.
1059. Health Outcomes International Pty Ltd for Department of Finance and Administration. *Monitoring and Evaluation Framework for the COAG Illicit Drugs Initiatives*. St Peters, SAMarch 2000.
1060. Makkai T. The emergence of drug treatment courts in Australia. *Substance Use and Misuse* 2002; 37(12–13):1567–1594.
1061. Freiberg A. Australian drug court: a progress report. In: 2nd Australasian Conference on Drugs Strategy. Perth: Western Australian Police Service; 2002.
1062. Makkai T. *Drugs Courts: Issues and Prospects*. Report No. 95. Canberra: Australian Institute of Criminology, September 1998.
1063. Belenko S. *Research on Drug Courts: A Critical Review*. New York: National Center on Addiction and Substance Abuse at Columbia University, 1998.
1064. Belenko S. *Research on Drug Courts: A Critical Review, 2001 Update*. New York: National Center on Addiction and Substance Abuse at Columbia University, 2001.
1065. Flick M, Eardley T. *Evaluation of the NSW Youth Drug Court Pilot Program. First Implementation Review*. SPRC Report No. 5/01. Sydney: Social Policy Research Centre, June 2001.
1066. Dive R, Killen M, Cole D, Poder A. NSW youth drug court trial. Paper presented at The 2nd Australasian Conference on Drugs Strategy. Perth: Western Australian Police Service, 7–9 May 2002.
1067. Freeman K. *New South Wales Drug Court Evaluation: Health, Well-Being and Participant Satisfaction*. Sydney: New South Wales Bureau of Crime Statistics and Research, 2002.
1068. Lind B, Weatherburn D, Chen S, Shanahan M, Lancsar E, Haas M, et al. *New South Wales Drug Court Evaluation: Cost-Effectiveness*. Sydney: New South Wales Bureau of Crime Statistics and Research and Centre for Health Economics Research and Evaluation, 2002.
1069. Freeman K. *New South Wales Drug Court Evaluation: Interim Report on Health and Well-Being of Participants*. Contemporary Issues in Crime and Justice Bulletin No. 53. Sydney: New South Wales Bureau of Crime Statistics and Research, February 2001.
1070. Taplin S. *The New South Wales Drug Court Evaluation: A Process Evaluation*. Sydney: New South Wales Bureau of Crime Statistics and Research, 2002.
1071. Department of Corrective Services. *Annual Report 2000/2001*. Brisbane: Queensland Government, 2001.
1072. Department for Correctional Services. *Annual Report 2000/2001*. Adelaide: Government of South Australia, 2001.
1073. Office of the Correctional Services Commissioner. *Victorian Prison Drug Strategy 2002*. Melbourne: State of Victoria, 2002.
1074. Department for Correctional Services. *Drug and Alcohol Strategy Project. Final Report* February 1998.
1075. Ryder D, Kraszlan K, Walker N, Fowler H, Omaji P. *Drug Court Pilot Feasibility Study. Interim Report*. Perth: Edith Cowan University, November 1998.
1076. Rutter S, Dolan K, Wodak A, Heilpern H. *Prison-based Syringe Exchange. A Review of the International Research and Program Development*. Technical Report No. 112. Sydney: National Drug and Alcohol Research Centre, 2001.
1077. Ministry of Justice Western Australia. Discussion paper for the Ministry of Justice. The provision of bleach availability programs for prisoners in Western Australia. In: Perth; 2001. p. 30.
1078. Dolan K. *Surveillance and Prevention of Hepatitis C Infection in Australian Prisons: A Discussion Paper*. Technical Report No. 95. Sydney: National Drug and Alcohol Research Centre, May 2000.
1079. Inciardi JA, Martin SS, Butzin CA, Hooper RM, Harrison LD. An effective model of prison-based treatment for drug-involved offenders. *Journal of Drug Issues* 1997; 27(2):261–278.
1080. McGeorge J, Crofts N, Burrows C. Disaffected or disinfected? The national disinfection of used injecting equipment project. Paper presented at 'Out There Too' Social Research and Practice Forum. Adelaide, 14–15 March 1996.
1081. Gore SM, Bird AG, Cassidy J. Prisoners' views about the drugs problem in prisons, and the new Prison Service drug strategy. *Communicable Disease and Public Health* 1999; 2(3):196–197.

1082. Department of Corrective Services. *Addressing Illicit Drug Use By Offenders: Action Plan*. Brisbane: Queensland Government, 2001.
1083. Close H. *Pilot of Sweat Patch Usage Within Two WA Community Corrections Centres. Final Evaluation Report*. Perth: Department of Justice Western Australia, September 2001.
1084. Department of Health Housing Local Government and Community Services. *National Drug Strategic Plan 1993-97*. Canberra: Australian Government Printing Service, 1993.
1085. Hawks D, Lenton S. Harm reduction in Australia: has it worked? A review. *Drug and Alcohol Review* 1995; 14(3):291-304.
1086. Single E, Rohl T. *The National Drug Strategy: Mapping the Future*. Report Commissioned by the Ministerial Council on Drug Strategy. Canberra: Australian Government Printing Service, 1997.
1087. Lenton S, Single E. The definition of harm reduction. *Drug and Alcohol Review* 1998; 17(2):213-220.
1088. Borland R, Scollo M. Opportunities for harm minimization in tobacco control. *Drug and Alcohol Review* 1999; 18:345-353.
1089. Wells-Parker E, Bangert-Drowns R, McMillen R, Williams M. Final results from a meta-analysis of remedial interventions with drink/drive offenders. *Addiction* 1995; 90:907-926.
1090. Voas RB, Fisher DA. Court procedures for handling intoxicated drivers. *Alcohol Research and Health* 2001; 25:32-42.
1091. Rydon P, Stockwell T. Local regulation and enforcement strategies for licensed premises. In Single E, Stockwell T (eds) *Alcohol: Minimising the Harm. What Works?* New York: Free Association Books Ltd, 1997;211-229.
1092. Voas RB, Marques PR, Tippetts AS, Beirness DJ. The Alberta Interlock Program: the evaluation of a province-wide program on DUI recidivism. *Addiction* 1999; 94:1849-1860.
1093. Marques PR, Voas RB, Tippetts AS, Beirness DJ. Behavioral monitoring of DUI offenders with the Alcohol Ignition Interlock Recorder. *Addiction* 1999; 94:1861.
1094. Boots K, Midford R. *Promoting Safe Parties: Evaluation of the 1993 Geraldton Partysafe Campaign*. Perth: National Centre for Research into the Prevention of Drug Abuse, Division of Health Sciences, Curtin University of Technology, 1995.
1095. Stevenson M, Palamara P, Rooke M, Richardson K, Baker M, Baumwol J. Drink and driving: what's the skipper up to? *Australian and New Zealand Journal of Public Health* 2001; 25(6):511-513.
1096. Stockwell T. Responsible alcohol service: lessons from evaluations of server training and policing initiatives. *Drug and Alcohol Review* 2001; 20:257-265.
1097. Drew LR, Truswell AS. Wernicke's encephalopathy and thiamine fortification of food: time for a new direction? *Medical Journal of Australia* 1998; 168(11):534-535.
1098. Wodak A, Richmond R, Wilson A. Thiamin fortification and alcohol. *Medical Journal of Australia* 1990; 152(2):97-99.
1099. Connelly L, Price J. Preventing the Wernicke-Korsakoff syndrome in Australia: cost-effectiveness of thiamin-supplementation alternatives. *Australian and New Zealand Journal of Public Health* 1996; 20(2):181-187.
1100. Joing Ma J, Truswell AS. Wernicke-Korsakoff syndrome in Sydney hospitals: before and after thiamine enrichment of flour. *Medical Journal of Australia* 1995; 163:531-534.
1101. Hawks D, Rydon P, Stockwell TR, White M, Chikritzhs T, Heale P. *The Evaluation of the Fremantle Police Licensee Accord: Impact on Servicing Practices, Harm and the Wider Community*. Perth: National Drug Research Institute, Curtin University of Technology, 1999.
1102. Rumbold G, Malpass A, Lang E, Cvekovski S, Kelly W. *An Evaluation of the Geelong Local Industry Accord: Final Report*. Melbourne: Turning Point, 1998.
1103. Stockwell T. Regulation of the licensed drinking environment: a major opportunity for crime prevention. *Crime Prevention Studies* 1997; 7:7-34.
1104. Mosey A. *Central Australian Night Patrols: A Review*. Alice Springs: Drug and Alcohol Services Association, 1994.

1105. Daly A, Gvozdenovic A. *Evaluation of the Impacts of Public Drunkenness Decriminalisation Legislation and the Establishment of Sobering Up Facilities on Aboriginal People in Northern Western Australia*, 2 vols. Perth: Western Australian Alcohol and Drug Authority, 1994.
1106. McGregor C, Hall K, Ali R, Christie P, Braithwaite R, Darke S. *It's Rarely Just the 'h': Addressing Heroin Overdose Among South Australian Heroin Users Through a Process of Intersectoral Collaboration*. Parkside: Drug and Alcohol Services Council, 1999.
1107. Ministerial Council on Drug Strategy. *National Heroin Overdose Strategy*. Canberra: Commonwealth of Australia, 2001.
1108. Ministerial Council on Drug Strategy. *National Heroin Overdose Strategy. Summary*. Canberra: Commonwealth Department of Health and Aged Care, July 2001.
1109. Hall W. Reducing the toll of opioid overdose deaths in Australia. *Drug and Alcohol Review* 1995; 18:213–220.
1110. Lenton S, Hargreaves K. A trial of naloxone for peer administration has merit, but will the lawyers let it happen? *Drug and Alcohol Review* 2000; 19:365–369.
1111. Lenton S, Hargreaves K. Should we conduct a trial of distributing naloxone to heroin users for peer administration to prevent fatal overdose? *Medical Journal of Australia* 2000; 173:260–263.
1112. Loxley W. Doing the possible: Harm reduction, injecting drug use and blood borne viral infections in Australia. *International Journal of Drug Policy* 2000; 11:407–416.
1113. Crofts N, Dore G, Locarnini S. *Hepatitis C. An Australian Perspective*. Melbourne: IP Communications; 2001.
1114. Lurie P, Reingold AL, Bowser B, Chen D, Foley J, Guydish J, et al. *The Public Health Impact of Needle Exchange Programs in the United States and Abroad*. San Francisco: University of California; 1993.
1115. Paone D, Des Jarlais DC, Gangloff R, Milliken J, Friedman SR. Syringe exchange: HIV prevention, key findings and future directions. *International Journal of the Addictions* 1995; 30(12):1603–1645.
1116. HIVDent. *Evidence-Based Findings on the Efficacy of Syringe Exchange Programs: An Analysis from the Assistant Secretary for Health and Surgeon General of the Scientific Research Completed Since April 1998*. HIV Dent, 2001. Viewed 26 September 2001, <<http://www.hivdent.org/public/ppesotsr062000.htm>>.
1117. Center for AIDS Prevention Studies. *Does Needle Exchange Work?* University of California, San Francisco, 1998. Viewed 25 October 2001, <<http://www.ama-assn.org/special/hiv/preventn/prevent3.htm>>.
1118. Commonwealth Department of Health and Ageing. *Return on Investment in Needle and Syringe Programs in Australia. Summary Report*. Canberra: Commonwealth Department of Health and Ageing, 2002.
1119. Coyle SL, Needle RH, Normand J. Outreach-based HIV prevention for injecting drug users: A review of published outcome data. *Public Health Reports* 1998; 113(Supplement 1):19–30.
1120. Darke S. Injecting drug users and the Human Immunodeficiency Virus: What do we know? *Drug and Alcohol Review* 1992; 11:153–161.
1121. Ward J, Mattick RP, Hall W. *Methadone Maintenance Treatment and Other Opioid Replacement Therapies*. Amsterdam: Harwood Academic Publishers, 1998.
1122. Kaldor JM, Lapsley HM, Mattick R, Weatherburn D. *Six Month Process Report on the Medically Supervised Injecting Centre*. Sydney: National Drug and Alcohol Research Centre, 2002.
1123. Kaldor J, Lapsley H, Mattick RP, Weatherburn D, Kimber J, MacDonald M. *Twelve-month Process Evaluation Report on the Medically Supervised Injecting Centre*. Sydney: National Drug and Alcohol Research Centre, May 2002.
1124. Dolan K, Kimber J, Fry C, Fitzgerald J, McDonald D, Trautmann F. Drug consumption facilities in Europe and the establishment of supervised injecting centres in Australia. *Drug and Alcohol Review* 2000; 19:337–346.

1125. Kimber J, Dolan K, Wodak A. *International Survey of Supervised Injecting Centres (1999-2000)*. Technical Report No. 126. Sydney: National Drug and Alcohol Research Centre, 2001.
1126. Lindesmith Center. *Safer Injecting Rooms*. New York: Lindesmith Center, 1999.
1127. Dillon P. Key findings from the 12-month report of the Medically Supervised Injecting Centre, 2002. Viewed 24 May 2002, <<http://ndarc.med.unsw.edu.au/ndarc.nsf/website/News.pressreleases.MSIC.2002>>.
1128. Loxley W. Hepatitis C and B in people who inject drugs: testing and vaccination - major opportunities for prevention. Paper presented at NDRI Symposium "Injecting Drugs: The Prevention of Blood Borne Viruses and Overdose". West Perth, 4 August 2000.
1129. Communicable Diseases and Health Protection Branch, Population Health Division. *Retractable Needle and Syringe Technology*. Media Release. Canberra: Department of Health and Aged Care, 2002.
1130. Des Jarlais DC. "Single-use" needles and syringes for the prevention of HIV infection among injection drug users. *Journal of Acquired Immune Deficiency Syndromes and Human Retrovirology* 1998; 18(Suppl 1):S52-S56.
1131. Caulkins JP, Kaplan E, Lurie P, O'Connor T, Ahn S-H. Can difficult-to-reuse syringes reduce the spread of HIV among IDUs? *Interfaces* 1998; 28:23-33.
1132. Lenton S, Boys A, Norcross K. Raves, drugs and experience: Drug use by a sample of people who attend raves in Western Australia. *Addiction* 1997; 92(10):1327-1337.
1133. New South Wales Government. *Code of Practice for Dance Parties*. Sydney: New South Wales Government, 1998.
1134. Winstock A, Vingoe L. Pill-testing: Harm reduction or just a bitter pill to swallow? National Addiction Centre - London, 2000. Viewed 11 August 2001, <http://www.clubhealth.org.uk/pages/2000/s5_p2.htm>.
1135. European Monitoring Centre for Drugs and Drug Addiction. *On-Site Pill-Testing Interventions in the European Union*. Vienna: European Monitoring Centre for Drugs and Drug Addiction, 2001.
1136. Fry C, Bruno R. *Trends in Benzodiazepine Use Among Injecting Drug Users in Victoria and Tasmania: Findings from the Illicit Drug Reporting System*. Drug Trends Bulletin. Canberra: Commonwealth Department of Health and Aged Care, June 2001.
1137. Burns C, Currie B, Powers JR. Unleaded petrol: a useful harm-reduction strategy for petrol sniffers? In Brady M, Torzillo P (eds) *Workshop on Lead And Hydrocarbon Toxicity From Chronic Petrol Inhalation: 5-6 May 1994, Alice Springs*. Canberra: Australian Government Publishing Service, 1995.
1138. Newman I, Anderson C, Farrell K. Role rehearsal and efficacy: two 15 month evaluations of a ninth-grade alcohol education program. *Journal of Drug Education* 1992; 22(1):55-67.
1139. Gray D, Saggars S, Sputore B. Interventions for Indigenous Australians: the broader context. In *Best Practice Interventions in Corrections for Indigenous People: Papers from a Conference in Sydney 8-9 October 2001*. Sydney: Australian Institute of Criminology in conjunction with the Department of Corrective Services NSW, 2002.
1140. National Aboriginal Health Strategy Working Party. *A National Aboriginal Health Strategy*. Canberra: Australian Government Publishing Service, 1989.
1141. Lindorff K. *Tobacco: Time for Action. Final Report*. National Aboriginal and Torres Strait Islander Tobacco Control Project. Canberra: National Aboriginal Community Controlled Health Organisation, 2002.
1142. Kunitz S. *Disease and Social Diversity: The European Impact on the Health of Non-Europeans*. New York: Oxford University Press; 1994.
1143. Gardiner-Garden J. *Identifiable Commonwealth Expenditure on Aboriginal and Torres Strait Islander Affairs*. Current Issues Brief No. 18 1997-98. Canberra: Parliament of Australia, Department of the Parliamentary Library, 2001.

1144. Deeble J, Mathers C, Smith L, Goss J, Webb R, Smith V. *Expenditures on Health Services for Aboriginal and Torres Strait Islander People*. Canberra: Department of Health and Family Services, 1998.
1145. Mooney G. Australian health care: fair enough? or only an un-fair go? Paper presented at Health Division Forum. Perth: Curtin University of Technology, 2002.
1146. Commonwealth Department of Health and Aged Care. *Review of the Commonwealth's Aboriginal and Torres Strait Islander Substance Misuse Program. Final Report*. Canberra: Commonwealth of Australia, 1999.
1147. Holder HD, Saltz RF, Grube JW. A community prevention trial to reduce alcohol-involved accidental injury and death: overview. *Addiction* 1997; 92(Suppl. 2):S155–S171.
1148. Guy S, M., Smith G, M., Bentler P, M. Consequences of adolescent drug use and personality factors on adult drug use. *Journal of Drug Education* 1994; 24(2):109–132.
1149. Baumrind, D. The influence of parenting style on adolescent competence and substance use, *Journal of Early Adolescence* 1991: 11; 56–95.