



Preventing harmful drug use

Introduction

Preventing harmful drug use is a priority for governments across Australia. The field of prevention is intimately tied to research, and important findings are being published daily. These Prevention Research Evaluation Reports are designed to facilitate access to the growing prevention knowledge base. A series of twelve reports will be published over the coming months. This first report introduces an approach which emphasises the prevention of harmful drug use.

Historical background

Early efforts to prevent drug problems typically relied upon information strategies that were based on a mixture of common sense and good will. On the common sense assumption that drug problems were the result of children being poorly informed, programs aimed to increase knowledge of drug use. In many cases these programs simply piqued children's curiosity and resulted in more drug use. These early failures led to recognition that either knowledge alone or generalised changes in attitudes and intentions would generally not be sufficient to reduce drug use by young people. Later prevention efforts were founded on the assumption that young people's drug use was due to inadequate value clarification or low self-esteem. These programs also tended to be ineffective, often failing to change attitudes, values or self-concept (Midford, Lenton & Hancock, 2000).

The Life Education program was part of this early effort in Australia, and involved sending expensively equipped vans into primary schools in order to demonstrate to children the effects of drug use. The children's strong conviction at the completion of such programs

that they would never use drugs beguiled teachers and parents into believing these programs were effective. Research suggested, however, that as the children moved into adolescence childish concepts including childhood abstinence pledges were often set aside (Hawthorne, 1996). Although follow-up research typically finds that specific drug education prior to adolescence does not reduce young people's drug use (e.g., Shope et al., 1996; Ringwalt, Ennett & Holt, 1991), both in Australia and in other countries it has proved very difficult to shift prevention programs to align with this evidence. Awareness that the best-intended prevention efforts can fail has led to calls for a greater emphasis on program evaluation.

Prevention of harmful drug use

In order to be effective, programs aimed at preventing drug problems must integrate with wider social priorities and prevention efforts. It is possible to conceptualise the broad range of prevention programs aimed at advancing health and mental health, and preventing crime and harmful drug use to be part of the field of health promotion. In Victoria, this field is currently directed by positive goals such as encouraging individual and social changes in order to optimise health and well-being (Victorian Health Promotion Foundation, 1999).

According to the National Mental Health Strategy, 'prevention' refers to interventions that occur before the initial onset of a disorder, to prevent the development of that disorder (National Mental Health Strategy, 1999). The term 'drug abuse prevention' can be used narrowly to refer to services and programs delivered earlier in life in order to reduce the

druginfo.adf.org.au

1300 85 85 84

incidence of drug abuse or dependence later in life. Australian policies emphasise the minimisation of drug-related harm (National Drug Strategy, 2001). In this context, prevention encompasses a broader set of goals, including reduction of supply, demand and harm, and is not limited to the reduction of drug use. In what follows, potential targets for preventing harmful drug use by young people are examined.

Which drug use behaviours should be prevented?

Tobacco

Tobacco use is the greatest contributor to preventable health and social costs, both in Australia and in other nations. As a result of concerted public health investment, adult rates of tobacco use have fallen over the past decades, such that currently less than 20 per cent of adults are regular smokers. Success in the broader population has not been mirrored in the youth population, where the trend has been for tobacco use to increase through most of the 1990s (Hill, White & Effendi, 2002). National School Drug Survey data reveal that more than 70 per cent of 17-year olds had tried cigarette smoking in 1999, and more than 30 per cent were smoking on a weekly or more regular basis (Hill, White & Effendi, 2002). Tobacco use is of concern amongst young people, due to its tendency to lead to tobacco dependence, and via this mechanism to serious health impacts. Tobacco use can also endanger the health of others, since exposure to maternal tobacco use prior to birth can lead to serious developmental deficits. Environmental tobacco smoke can also threaten the health of children and adults. Youthful involvement in tobacco use appears to increase the risk of other forms of drug use, after controlling for pre-existing drug-abuse risk factors (e.g. Newcomb & Felix-Ortiz, 1992). Although the negative consequences of tobacco use tend to be long-term, young people with respiratory problems or chronic illness may be at acute risk. Relevant prevention targets include preventing youth uptake of (experimentation with, initiation to) tobacco use and encouraging tobacco users to quit (National Tobacco Strategy, 1999).

Alcohol

Alcohol is second only to tobacco in the scale of the preventable harm it exacts upon Australian society. In 1996, the estimated economic cost of alcohol consumption to the Australian community was more than \$4.5 billion (Department of Health and Aged Care, 2001). Alcohol-related harms are closely aligned with overall levels of alcohol consumption. This conclusion emerges through analysis of both Australian population trend data (Catalano et al., 2001) and individual behaviour (Wechsler et al., 1995). Moderate levels of alcohol use are unlikely to contribute to harm, and may have health benefits for particular population sub-groups such as older males, thus emphasising the importance of specifying the levels of alcohol use that are likely to result in harm. Two forms of harm are commonly identified for alcohol consumption (World Health Organization, 2000). Acute harms are short-term health problems such as accidents and injuries that can result through a single episode of excessive alcohol use. Chronic harms are longer-term consequences such as organ damage, which can result through regular and high-level alcohol consumption. Rates of potentially harmful alcohol use tend to be highest in Australia for young people aged 18–24 (Heale et al., 2001). Follow-up studies demonstrate that levels of alcohol use in young adulthood are strongly predicted by alcohol use behaviours established in adolescence (e.g. Bachman, O'Malley & Johnston, 1984). Although a range of alcohol interventions have focussed on limiting the amount of alcohol consumed in a session, two recent (unpublished) Victorian follow-up studies suggest that encouraging high school students to drink less frequently might be a useful alcohol prevention target. Bonomo (2001) found that young people who drank more frequently in high school (on more than two days each week) had a greater likelihood of alcohol dependence in early adulthood. Toumbourou et al. (2002b) found that students using alcohol on a less than weekly basis in Year 12 were likely to maintain this pattern through the years following high school, and by age 21 reported less alcohol-related harm. The age at which alcohol is first used has been shown in the United States of America to be an

important predictor for the development of alcohol dependence later in life (Grant & Dawson, 1998). Age of alcohol initiation has also been shown to predict later alcohol problems amongst young people in New Zealand (Fergusson, Lynskey & Horwood, 1994). These findings suggest that a prevention target might be to delay 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, since parents are the main source from which early adolescents obtain alcohol (White, 2001). Efforts in Australia to teach young people strategies by which 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 deaths (Moon, Meyer & Grau, 1999) and reductions in levels of alcohol use in young people (McBride et al., 2000). Maintaining prevention programs aimed at minimising or reducing risky alcohol use appears to be warranted.

Cannabis

Although the costs are difficult to quantify, it appears likely that cannabis use is contributing to a high level of health and social costs through its adverse influence on young people's development. Cannabis is the most widely used illicit drug in Australia, with some surveys indicating that more than 50 per cent of secondary students report 'ever use' by the time they complete their secondary schooling. Coffey et al. (2000) estimated that around 10 per cent of Victorian young people used cannabis on a weekly or more frequent basis by late secondary school (frequent users). Current evidence suggests that cannabis use has potential harms that relate to both acute and chronic effects. Acute effects may be apparent for the large number of infrequent, experimental or recreational users, and relate to the immediate state of cannabis intoxication. For all users, cannabis use can create temporary impairment to thinking, which can create risks where skilled judgements or decisions are required. Although a causal link to impaired driving has not been

demonstrated, cannabis is the second most-frequently detected drug found in driver autopsies following fatal vehicle accidents (Drug Policy Expert Committee, 2000). The extent to which cannabis intoxication contributes to youth accident and injury is unclear. For those vulnerable to mental health problems, single episodes of heavy cannabis intoxication may be triggering events that destabilise mental health. The proportion of young people who experience adverse mental health outcomes through relatively infrequent cannabis use is unknown. Early experimentation with cannabis and recreational use is a risk factor for escalation to more frequent use. In Victorian research, Coffey et al. (2000) estimated that, after controlling for other influences, early cannabis use approximately doubled the odds of escalation to frequent cannabis use in late secondary school. There is now consistent evidence that adolescent cannabis use increases the risk of subsequent illicit drug use. This is established from research in the United States (eg. Johnson et al., 1995), from Ferguson's follow-up of the cohort in Christchurch, New Zealand (Fergusson & Horwood, 2000) and in the follow-up of the Australian Temperament Project (ATP) cohort in Victoria (Williams et al., 2000). In the Victorian ATP study, among those who at age 13 had not tried cannabis, 1.7 per cent reported illicit drug use by age 15, while among those who had tried cannabis at age 13, the percentage who had tried illicit drug use by age 15 was 10 per cent. A range of chronic harms have been associated with more frequent cannabis use. These include cognitive and memory deficits, low school and work achievement, respiratory damage and cannabis dependence (Drug Policy Expert Committee, 2000). Using a structural modelling approach to control for the effects of poly drug use and tobacco use, Guy, Smith and Bentler (1993) found that more frequent cannabis use at age 14 predicted respiratory problems at age 26. In their review, Lynskey and Hall (2000) 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. Evidence is now firming to implicate mid- to late-adolescent cannabis use as a risk factor for early adult mental health problems. Follow-up of a community cohort in New York state demonstrated that, after controlling for initial mental health, heavier cannabis use at age 16 predicted personality disorder at age 22 (Brook, Cohen & Brook, 1998). McGee and colleagues (2000) found in the New Zealand Dunedin cohort that 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). Fergusson's follow-up demonstrated that frequent cannabis use in middle adolescence predicted later major depression and crime (Fergusson & Horwood, 1997). Targets for reducing harm associated with cannabis use might include preventing young people's initiation to cannabis use, reducing the number who progress to regular use and encouraging regular users to use less frequently.

Poly drug use

From early adolescence, there is a tendency for young people to use more than one substance, either mixing different substances in a single occasion of use or attempting to influence experience by interspersing different substances over time. This tendency to mix different substances is known as 'poly drug use'. Poly drug use is common amongst 'high-risk' young people. Although there is a growing body of knowledge relevant to the harms associated with specific substances, less is known of the harms associated with poly drug use. Early involvement in poly drug use is a marker of risk for later substance use problems. At age 13, approximately 9 per cent of the ATP cohort were engaged in poly drug use, and this pattern was predictive of more serious substance use at age 15 (Williams et al., 2000). Williams et al. (2000) noted that "taking any particular drug [by age 15] significantly increases the likelihood of taking another type of drug" (p. 26), 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 (Brook et al., 1998; Newcomb & Bentler, 1988) and 25/26 (Guy, Smith & Bentler, 1993). Poly drug use in early adolescence (age 13/14) tends to remain either stable or to escalate through to mid-adolescence (age 15/16; Krohn et al., 1996; Williams et al., 2000). Adolescent poly drug use tends to be an important and unique predictor of adult poly drug use (Guy, Smith & Bentler, 1994; Newcomb & Felix-Ortiz, 1992).

Collins and Lapsley (1992) estimated the costs of illicit drug use to be approximately \$1.7 billion annually, or 9 per cent of the total costs of alcohol and drug misuse. Loss of life contributes highly to these costs, and poly drug use has been shown to be a significant factor in heroin-related deaths. Alcohol was detected at autopsy in 46 per cent of fatal overdoses in the New South Wales study, and benzodiazepines in 27 per cent (Darke, Ross & Hall, 1996). In the Victorian study (Gerostamoulos, Staikos & Drummer, 2000), alcohol was detected in 37 per cent of cases, and benzodiazepines were present in 44 per cent of cases. Mixing cannabis and alcohol use is believed greatly to increase the acute risks associated with intoxication. In Victorian research examining autopsies for fatally injured drivers, alcohol was present for 27 per cent and cannabis was the next most-frequently detected substance, at 15 per cent (Drug Policy Expert Committee, 2000). The risk of asphyxiation is increased through the mixture of alcohol and benzodiazepines. Despite clear differences in their psychoactive properties, Darke, Kaye and Ross (1999) observed a tendency for injecting drug users to move intermittently between amphetamine and heroin use. Preventing poly drug use appears to be an important goal for reducing drug-related harm.

Illicit drug use

Use of illicit drugs other than cannabis is typically reported by less than 2 per cent of Victorian students (Bond et al., 2000). The National Drug Strategy Household Survey (Australian Institute of Health and Welfare, 1999) conservatively estimated that heroin use in 1998 to involve 1 per cent of 14–19-year-olds and 2.1 per cent of 20–29-year-olds. The most recent National Household Survey

completed in 2001 has been reported to show a slight reduction in overall involvement in illicit drug use.

Heroin use is associated with overdose, which can be fatal (Darke et al., 2000; Hall, Lynskey & Degenhardt, 2000), and when accompanied by poor resuscitation can result in acquired brain damage due to hypoxia (Darke et al., 2000). A significant risk in heroin use and other injecting drug use is the threat of transmission of blood-borne virus, such as Hepatitis C and HIV. Around half the clients tested at four Melbourne needle and syringe providers between 1995 and 1998 tested positive for Hepatitis C, while 1 per cent tested positive for HIV (Drug Policy Expert Committee, 2000). Preventing young people's involvement in injecting drug use may be an important prevention target.

There is little information regarding the prevalence of harms associated with inhalants. Less than 10 per cent of Victorian young people report inhalant use, and this behaviour appears more common in early adolescence (Bond et al., 2000). In one of the few follow-up studies, inhalant use by age 16 was a unique predictor of heroin use by age 32 (Johnson et al., 1995). Inhalant use appears to be an early marker of risk for later substance abuse.

Harmful drug use behaviours such as early adolescent poly drug use, inhalant use and illicit drug use may warrant a more targeted prevention approach in order to seek out and assist affected individuals and groups. A Victorian survey conducted in 1999 studied risk factors and protective factors influencing positive youth development. Findings demonstrated that the Victorian students using illicit drugs tended to have a high number of risk factors and lower protective factors in domains such as community, family, school and peer groups (Bond et al., 2000). Such evidence suggests that adolescent poly drug use, illicit drug use and inhalant use might be viewed as early warning signs indicating the need for more targeted prevention investment aimed at improving conditions for healthy youth development. Effective prevention strategies for improving healthy development in high risk groups tend to work in an integrated way to coordinate interventions across many environments, including families, schools and the wider community (Toumbourou et al., 2002a provides a recent review).

References

- Australian Institute of Health and Welfare 1999 *National drug strategy household survey 1998 – First results*, Australian Institute of Health and Welfare, Canberra, Catalogue number PHE 15
- Bachman, JG, O'Malley, PM & Johnston, LD 1984 'Drug use among young adults: The impacts of role status and social environment', *Journal of Personality and Social Psychology*, 47, pp. 629–45
- Bond, L, Thomas, L., Toumbourou, J, Patton, GC & Catalano, R 2000 *Improving the lives of young Victorians in our community: A survey of risk and protective factors*, Centre for Adolescent Health, report prepared for Community Care Division, Department of Human Services, ISBN 174056 001 9
- Bonomo, Y 2001 Unpublished PhD dissertation, University of Melbourne, Parkville, Victoria
- Brook, JS, Cohen, P & Brook, DW 1998 'Longitudinal study of co-occurring psychiatric disorders and substance use', *Journal of the American Academy of Child & Adolescent Psychiatry*, 37, pp. 322–30
- Brook, JS, Whiteman, M, Finch, S & Cohen, P 1998 'Mutual attachment, personality, and drug use: Pathways from childhood to young adulthood', *Genetic, Social and General Psychology*, 124, p. 492
- Catalano, P, Chikritzhs T, Stockwell T, Webb M, Rohlin C-J & Dietze P 2001 'Trends in per capita alcohol consumption in Australia, 1990/91 to 1998/99', *National Alcohol Indicators Project Bulletin 4*, National Drug Research Institute, Curtin University, Western Australia
- Coffey, C, Lynskey, M, Wolfe, R, & Patton, G 2000 'Initiation and progression of cannabis use in a population-based Australian adolescent longitudinal study', *Addiction*, 95, pp. 1679–90
- Collins, DJ & Lapsley, HM 1992 *Estimating the economic costs of drug abuse in Australia*, National Campaign Against Drug Abuse monograph series no. 15, Australian Government Publishing Service, Canberra
- Darke, S, Kaye, S & Ross, J 1999 'Transitions between the injection of heroin and amphetamines' *Addiction*, 94(12), pp. 1795–803
- Darke, S, Ross, J. & Hall, W. (1996) Overdose among heroin users in Sydney, Australia: I. Prevalence and

- correlates of non-fatal overdose. *Addiction*. 91(3):405-11.
- Darke, S, Ross, J, Zador, D & Sunjic, S 2000 'Heroin-related deaths in New South Wales, Australia, 1992-1996', *Drug & Alcohol Dependence*, 60(2), pp. 141-50
- Darke, S, Sims, J, McDonald, S & Wickes, W 2000 'Cognitive impairment among methadone maintenance patients', *Addiction*. 95(5), pp. 687-95
- Department of Health and Aged Care 2001, *Alcohol consumption in Australia*, Population Health Division, Canberra, downloaded 18th June 2001
<http://www.health.gov.au/pubhlth/strateg/drugs/alcohol/#development>
- Drug Policy Expert Committee 2000 *Drugs: Meeting the challenge, Stage 2 report*, Dept of Human Services, Victoria
- Fergusson, D & Horwood, LJ 2000 'Does cannabis use encourage other forms of illicit drug use?' *Addiction*, 95, pp. 505-20
- Fergusson, DM & Horwood, LJ 1997 'Early onset cannabis use and psychosocial adjustment in young adults' *Addiction*, 92, pp. 279-96
- Fergusson, DM, Lynskey, MT & Horwood, LJ 1994 'Childhood exposure to alcohol and adolescent drinking patterns', *Addiction*, 89, pp. 1007-16
- Gerostamoulos, J, Staikos, V & Drummer, OH 2000 'Heroin-related deaths in Victoria: A review of cases for 1997 and 1998', *Drug and Alcohol Dependence* 61:2, pp. 123-7
- Grant, BF & Dawson, DA 1998 'Age of onset drug use and its association with DS-IV drug abuse and dependence', *Journal of Substance Abuse*, 10, pp. 163-73
- Guy, SM, Smith, GM & Bentler, PM 1993 'Adolescent socialization and use of licit and illicit substances: Impact on adult health', *Psychology and Health*, 8, pp. 463-87
- Guy, SM, Smith, GM & Bentler, PM 1994 'Consequences of adolescent drug use and personality factors on adult drug use', *Journal of Drug Education*, 24 (2), pp. 109-32
- Hall, W, Lynskey, M. & Degenhardt, L 2000 'Trends of opiate-related deaths in the United Kingdom and Australia, 1985-1995', *Drug and Alcohol Dependence* 57:3, pp. 247-54
- Hawthorne, G 1996 '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*, 91: 8, pp. 1151-9
- Heale, P, Stockwell, T, Dietze, P, Chikritzhs, T & Catalano, P. 2001 'Patterns of alcohol consumption in Australia', *National Alcohol Indicators Bulletin* 3, National Drug Research Institute and Turning Point Alcohol & Drug Centre, Fitzroy, Victoria
- Hill, D, White, V & Effendi, Y 2002 'Changes in the use of tobacco among Australian secondary students: Results of the 1999 prevalence study and comparisons with earlier years' *Australian and New Zealand Journal of Public Health*, 26, pp. 156-63
- Johnson, EO, Schutz, CG, Anthony, JC & Ensminger, ME 1995 'Inhalants to heroin: A prospective analysis from adolescence to adulthood', *Drug and Alcohol Dependence*, 40, pp. 159-64
- Krohn, MD, Lizotte, AJ, Thornberry, TP, Smith, C & McDowall, D 1996 'Reciprocal causal relationships among drug use, peers, and beliefs: A five-wave panel model', *Journal of Drug Issues*, 26, pp. 405-28
- Lynskey, M & Hall, W 2000 'The effects of adolescent cannabis use on educational attainment: A review', *Addiction*, 95, pp. 1621-30
- McBride, N, Midford, R, Farrington, FH & Phillips, M 2000 'Early results of a school alcohol harm minimisation intervention: The School Health and Alcohol Harm Reduction Project [SHAHRP]', *Addiction* 95(7), pp. 1021-42
- McGee, R, Williams, S, Poulton, R & Moffitt, T 2000 'A longitudinal study of cannabis use and mental health from adolescence to early adulthood', *Addiction*, 95 (4), pp. 491-503
- Midford, R, Lenton, S & Hancock, L 2000 *A critical review and analysis: Cannabis education in schools*, NSW Department of Education and Training, New South Wales
- Moon, L, Meyer, P & Grau, J 1999 *Australia's young people: Their health and wellbeing 1999*, Australian Institute of Health and Welfare, Canberra Catalogue no. PHE 19
- National Drug Strategy 2001 *National Alcohol Strategy: A plan for action 2001 to 2003-4*, Department of Health and Aged Care, Canberra
- National Mental Health Strategy 1999 'Promotion, prevention and early intervention for mental health', Department of Health and Aged Care, Canberra
- National Tobacco Strategy 1999 *National Tobacco Strategy 1999-2002/03*, Department of Health and Aged Care, Canberra
- Newcomb, MD & Bentler, PM 1988 'Impact of adolescent drug use and social support on problems of young adults: A longitudinal study', *Journal of Abnormal Psychology*, 97, pp. 64-75
- Newcomb, MD & Felix-Ortiz, M 1992 'Multiple protective and risk factors for drug use and abuse: Cross-sectional and prospective findings', *Journal of Personality and Social Psychology*, 63, pp. 280-96 Ringwalt, C, Ennett, ST & Holt, KD 1991 'An outcome evaluation of Project DARE (Drug Abuse Resistance Education)', *Health Education Research*, 6, pp. 327-37

Shope, JT, Copeland, LA, Maharg, R & Dielman, TE 1996
'Effectiveness of a high school alcohol misuse prevention program', *Alcoholism: Clinical and Experimental Research*, 20, pp. 791–8

Toumbourou, JW, Snow, P, Sanci, L & Williams J 2002a
'Literature review of early intervention for young people with drug problems', prepared by the Centre for Adolescent Health and the Australian Drug Foundation for the Department of Human Services, Victoria

Toumbourou, JW, Williams, I, Snow, P & White, V 2002b
'Post school drinking histories and utilisation of harm minimisation strategies in the prediction of young adult alcohol related harms', Centre for Adolescent Health report prepared for the Australian Drug Foundation, Victoria

Victorian Health Promotion Foundation 1999 *VicHealth Mental Health Promotion Plan 1999–2002*, Victorian Health Promotion Foundation, Carlton, Victoria

Wechsler, H, Dowdall, GW, Davenport, A & Castillo, S 1995 'Correlates of college student binge drinking', *American Journal of Public Health*, 85, pp. 921–6

White, V 2001 *Australian secondary students' use of alcohol in 1999*, National Drug Strategy monograph no. 45, Commonwealth of Australia, Canberra

Williams, B, Sanson, A, Toumbourou, J & Smart, D 2000 *Patterns and predictors of teenagers' use of licit and illicit substances in the Australian Temperament Project cohort*, report prepared for the Ross Trust, Department of Behavioural Science, University of Melbourne, Parkville, Victoria

World Health Organization 2000 *International guide for monitoring alcohol consumption and harm*, Substance Abuse Department, World Health Organization, Geneva, Switzerland

This report was prepared for the DrugInfo Clearinghouse project by the Centre for Adolescent Health, Melbourne