**Cannabis Use among
Australian Youth**

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ACKNOWLEDGMENTS

EXECUTIVE SUMMARY

This report summarises the available research literature on cannabis use during adolescence and presents recent data from two surveys of the prevalence and extent of cannabis use among Australian youth: the National Drug Strategy Household Survey and the Australian School Students' Alcohol and Drugs Survey. The National Drug Strategy Household Survey conducted interviews with a total of 350 youth aged 14-19 year olds in 1995 while the Australian School Students' Alcohol and Drugs Survey, conducted in 1996, collected information on patterns of cannabis use from a national sample of over 30,000 school students. This report also reviews the international research literature to examine a number of issues including a) the factors associated with an increased risk of using cannabis; b) the correlates and consequences of early cannabis use; and c) possible strategies to prevent or delay cannabis use and cannabis related harm.

Results from the two surveys confirmed the findings of previous Australian studies that there is a high rate of cannabis use among youth. Among respondents from the Australian School Students' Alcohol and Drugs Survey 36.4% of all youth aged 12-17 years reported that they had used cannabis on at least one occasion. The majority of those who reported cannabis use had used the drug on only a few occasions, although a small minority (4% of males and 1.4% of females) reported using cannabis on at least six occasions in the past week. Additionally, there were both age and gender differences in rates of cannabis use: with increasing age students were more likely to report cannabis use, while at all ages males were more likely than females to report lifetime and regular cannabis use.

Finally, comparison of the results from this study with results from previous surveys suggests that there may have been an increase in the prevalence of cannabis use among youth in the last 10 years or so. Specifically, previous regionally based surveys conducted in the early 1990's suggested that in the region of 25% of those aged 12-17 years had used cannabis compared with 36% reported in the current survey. Such comparisons should, however, be treated with caution, as the different surveys used different sampling frames and different questionnaire formats. Nonetheless, the apparent increase in the prevalence of cannabis use among Australian youth has been paralleled by rising rates of other drug related harm in Australia and by international evidence of an increase in the prevalence of cannabis use among youth.

The risk factors that have been identified in the literature as being associated with increased rates substance use among youth include: peer affiliations; family environment and family substance use behaviours; individual behavioural predispositions and personality factors; intelligence and school related factors; and general measures of social disadvantage.

Research into the correlates and consequences of early cannabis use suggests that young people who report cannabis use are also more likely to report a range of adverse or 'problem' behaviours including sexual risk taking, criminal offending and mental health problems. A large part of these associations arise from the influence of adverse social family and individual factors which place the individual at increased risks for a number of adverse outcomes. While early cannabis use may contribute to some of this increased risk, particularly the risk of subsequent substance use and misuse, early cannabis use makes a smaller contribution to maladjustment.

Research on strategies for delaying or preventing cannabis use among youth and for minimising the harms caused by substance use is reviewed. Five broad classes of prevention strategy are identified: a) interventions aimed at social and contextual factors; b) interventions targeted at high-risk families; c) school based interventions targeted at high risk individuals; d) school based interventions targeted at teaching life skills and peer resistance skills; and e) harm minimisation strategies aimed at reducing the potentially harmful effects of cannabis use among those who use the drug. The effective reduction of harms caused by cannabis use will not be achieved by the application of any one of these strategies in isolation. Instead, a broad range of programs and interventions need to be implemented concurrently.

Finally, given an apparent increase in the prevalence of cannabis use among youth, it is important that continued efforts be made to monitor changes in the extent of cannabis use among young Australians.

1. Introduction

Cannabis is the most commonly used illicit drug in Australia. Estimates from the most recent National drug Strategy Household survey, conducted in 1995, suggest that around 31% of the adult population have tried cannabis at least once, and 4.9% report using it weekly (Commonwealth Department of Health and Family Services, 1996). Similarly, regionally based surveys of secondary school students have indicated that cannabis use is common among young people attending school. For example, a survey of 3828 New South Wales school children conducted in 1992 indicated that 25.4% of those aged 12-17 years reported that they had used cannabis at least once and 7% reported using it on at least a weekly basis (Cooney, Dobbinson & Flaherty, 1994).

There is also evidence that the prevalence of cannabis use in Australia has increased in recent years. Specifically, in his evaluation of the National Drug Strategy, Williams (1997) notes that successive waves of the National Drug Strategy Household Survey have documented an increase in the prevalence of cannabis use among youth: among males and females aged 14-19 years the self reported prevalence of cannabis use during the past 12 months rose from 20.8% in 1988 to 28.4% in 1995.

These trends are not unique to Australia. Cannabis is the most widely used illicit drug in many countries and similar levels of cannabis use to those in Australia have been documented in a number of other countries including the United States (Johnston, O'Malley & Bachman, 1996), Great Britain (Miller & Plant, 1996), Canada (Adlaf & Smart, 1991), New Zealand (Poulton, Brooke, Moffitt, Stanton & Silva, 1997) and the Netherlands (MacCoun & Reuter, 1997). Similarly, the apparent rise in the prevalence of cannabis use in Australia has been matched by recent increases in other countries. For example, evidence from the United States has documented a sharp rise in the prevalence of cannabis use among U.S school children since 1991. Specifically, the Monitoring the Future Project has collected information from large, representative samples of schoolchildren for each year from 1991 to 1995 (Johnston et al, 1996). During this interval the lifetime prevalence of cannabis use among 8th graders rose from 10.2% to 19.9%; among 10th graders it rose from 23.4% to 34.1% and among 12th graders it rose from 47.6% to 51.5%.

Although cannabis is widely used in many countries, such use is not without potential risks. Hall, Solowij and Lemon (1994) have reviewed the detrimental health effects of cannabis use. These include:

> **1. Acute effects**. Anxiety, dysphoria, panic and paranoia; cognitive impairment for the duration of intoxication; psychomotor impairment; an increased risk of psychotic symptoms among those vulnerable to such psychosis.

2. Chronic effects. Hall et al (1994) suggest that the chronic, heavy use of cannabis is *probably* associated with increased risks of respiratory diseases associated with smoking the drug; development of a cannabis dependence syndrome and subtle forms of cognitive impairment. Additionally, Hall et al (1994) conclude that chronic heavy cannabis use is *possibly* associated with an increased risk of developing cancers of the aerodigestive tract; an increased risk of leukemia and birth defects among offspring exposed *in utero*; and a decline in occupational and educational performance.

The frequency of cannabis use is often quite low among school students and many of the chronic health conditions described above are only likely to occur in older individuals who have been using cannabis for a protracted period of time. Nevertheless, it is appropriate to examine the use of cannabis among youth as: 1) Cannabis use is typically initiated during adolescence; 2) The heaviest use of cannabis typically occurs in late adolescence when individuals are at greatest risk of experiencing (acute) negative effects of cannabis use; 3) Early onset of cannabis use has been suggested as a risk factor for the development of later substance related problems, possibly because the use of cannabis during adolescence disrupts the completion of developmental tasks.

1.1 AIMS

The aims of this report are to summarise data on cannabis use among youth using data from both the National Drug Strategy Household Survey and the Australian School Students' Alcohol and Drugs Survey. Additionally, this report will present data from the international literature on the predictors of cannabis use, the consequences of cannabis use in adolescence and possible strategies to prevent cannabis use and cannabis related harm among youth. This report will be divided into three sections:

The first section gives a brief outline of previous Australian research that has examined the prevalence and extent of cannabis use among samples of adolescents and youth.

The second section presents detailed analyses of the prevalence of cannabis use among youth using data from the 1995 National Drug Strategy Household survey and the 1996 Australian School Students' Alcohol and Drugs Survey. This section also uses National Drug Strategy Household Survey data to: 1) Examine the context of cannabis use among youth; 2) Provide comparisons of cannabis users and non users on their extent of other drug use; and 3) Examine the extent to which there may have been an increase in the prevalence of cannabis use among youth in recent years.

The final section of the report reviews the international literature on adolescent cannabis use, to identify: 1) Possible predictors of the early onset of cannabis use and problem use; 2) The consequences of cannabis use and; 3) Implications of these findings for the prevention of substance use and other problem behaviours in youth.

2. Previous Australian Studies of Cannabis Use among Youth

There have been a number of studies that have examined the prevalence and extent of cannabis use among adolescents and youth in Australia. A brief summary of the prevalence estimates derived from a number of such studies is provided in Appendix 1. These studies were selected on the following criteria: a) Firstly, the samples were predominantly adolescents and it was possible to obtain prevalence estimates for adolescent and young adult samples separately from those estimates for older age groups; b) Secondly, they were studies based on samples drawn either from the general population or from student samples. Studies based on specialist populations, such as clinic attendees, were excluded from these analyses; c) Thirdly, it had to be possible to estimate the prevalence of cannabis use by age (in years); d) Finally, only those studies published after 1985 were considered. While these studies are unlikely to provide a complete list of all studies on cannabis use published in Australia since 1985, they adequately summarise the prevalence of cannabis use over this period.

Appendix 1 reports prevalence estimates from a total of seven studies and the estimates from these studies have ranged from 19.3% to 29.7% with a median value of 23.2%. To summarise the information from these studies the results from those studies which had reported prevalence estimates separately by age (in yearly intervals) and gender were pooled (Christie et al, 1989; 1990; Cooney et al, 1994; Donnelly et al, 1990). The pooled estimates of the prevalence of lifetime cannabis use among youth are summarised in Figure 1 (The raw data on which this figure was based is shown in Appendix 2).

The results in this Figure show that approximately one fifth of students reported that they have ever used cannabis. Additionally, there were clear age differences in the prevalence of cannabis use: the pooled estimates suggested that only 6.0% of 12 year olds had used cannabis but this rose steadily to 34.6% by age 17. There were also consistent gender differences in the prevalence of cannabis use. Pooling the data from the different studies suggests that, across all age categories, the prevalence of cannabis use among males was 26.6% while the prevalence of cannabis use among females was 17.0%.

Figure 1: Pooled estimates of the lifetime prevalence of cannabis use among males and females aged 12 to 17 years
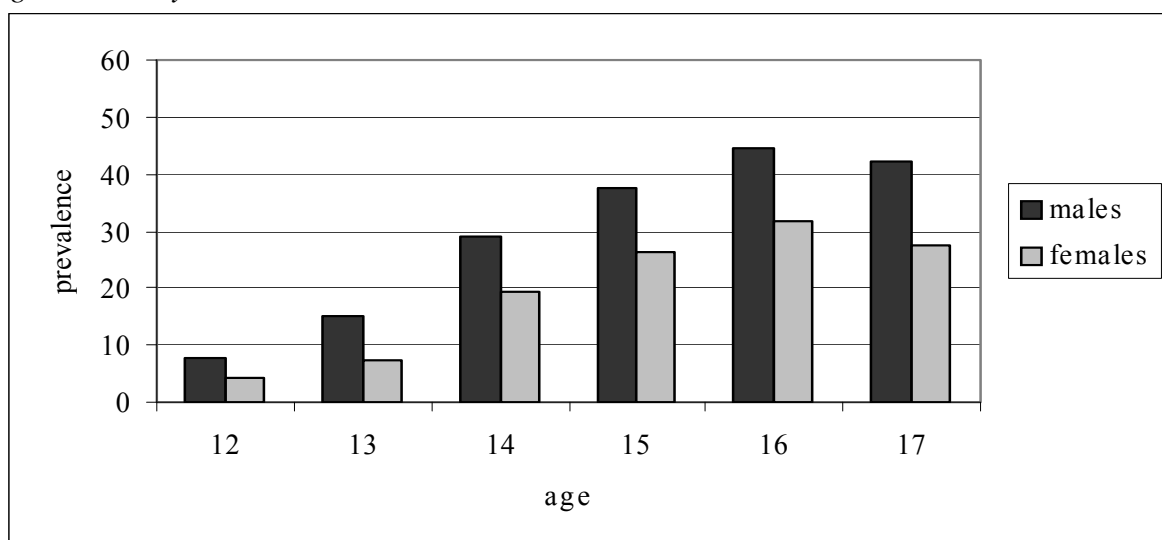
2.1 The Extent of Cannabis Use

These data provide good information on the numbers of adolescents who report cannabis use, but they provide no information on the extent of cannabis use among adolescents. The issue of the frequency and extent of cannabis use among young people is explored in Table 1 which summarises the results of a number of large scale studies which have reported the extent and frequency of cannabis use among adolescents. The Table shows, for each study, the study name, a sample description, definitions of regular cannabis use and the percentage of the sample reporting each level of cannabis use. It should be noted that the comparison of results across different studies is problematic as different studies have used idiosyncratic definitions of the frequency of cannabis use. Even those studies that have apparently used similar categories have, in some instances, used different definitions of cannabis use. For example, Christie et al (1989; 1990) asked students whether they used cannabis on a weekly basis while Cooney et al (1994) defined weekly use of cannabis as having used cannabis between 3 and 5 times in the past month. While these differences in the definition of different categories of cannabis use make precise comparisons difficult, the results summarised in Table 2 nonetheless suggest a number of conclusions. Firstly, the majority of young people who reported having used cannabis had used it infrequently. For example, Cooney et al (1994) reported that 25.4% of 12-17 year olds had used cannabis but only 7.0% of students reported using cannabis on a weekly basis. Estimates from the three studies summarised in Table 1 suggested that 4.8% to 7.0% of school students reported smoking cannabis on a weekly basis. That indicates that approximately one quarter of those who have ever used cannabis continue to use weekly or more frequently. These results also show that the prevalence of regular cannabis use increases with increasing age and that more males than females use cannabis on a regular basis.

Finally, it should be noted that the estimates presented above are likely to underestimate the prevalence of cannabis use among Australian youth. This will occur for a number of reasons including: a) young people who use cannabis may be more likely to refuse to participate in such a survey; b) young people at high risk for cannabis use may be excluded from household surveys because they can not be contacted (e.g., the homeless); c) School surveys exclude students at high risk of cannabis use because of absenteeism and truancy (Newcomb and Bentler, 1989). Additionally, the prevalence estimates from the studies summarised in Table 1 may underestimate the true prevalence of cannabis use as it seems probable that a number of young people who had used cannabis would choose to conceal this behaviour. A more detailed discussion of the reliability and validity of self-report data on cannabis use is provided in section 5.1.

Against this general background, the aim of the present study is to report results on the prevalence and extent of cannabis use among adolescents using data collected from two sources: a) The most recent National Drug Strategy Household Survey, which was conducted in 1995 and interviewed a total of 350 respondents in the age range 14-19 years and; b) The Australian School Students' Alcohol and Drugs Survey, which questioned over 30,000 young people about their use of cannabis. These analyses will present detailed information on age and gender differences in the prevalence of cannabis use and the extent of frequent or heavy cannabis use.

Table 1: Summary of previous studies that have examined the prevalence of cannabis use among Australian adolescents

Study Name	Sample Description	Outcome studied	Age	Prevalence of cannabis use	
				Males	Females
Christie et al (1989)	Survey of South Australian school children in years 7 -11 - data collected in 1987	Use of Cannabis Weekly	11 years 12 years 13 years 14 years 15 years 16 years 11-16 years	0.0% 0.0% 3.1% 6.6% 10.7% 9.2% 5.4%	1.0% 0.0% 1.8% 4.8% 6.3% 8.4% 3.7%
Christie et al (1990)	Survey of South Australian school children in years 7 - 11 - data collected in 1988	Use Cannabis Weekly	11 years 12 years 13 years 14 years 15 years 16 years 11-16 years	1.9% 1.9% 3.3% 5.7% 10.9% 16.4% 6.4%	0.0% 0.0% 0.4% 3.5% 6.9% 6.9% 3.1%
Cooney, Dobbinson & Flaherty (1994)	1992 Survey of New South Wales school students	Used cannabis at least weekly (i.e. used cannabis 3-5 times in last month)	12 years 13 years 14 years 15 years 16 years 17 years 12-17 years	2% 4% 8% 14% 18% 11% 9.2%	1% 2% 6% 6% 8% 7% 4.7%

3. Method

3.1. THE NATIONAL DRUG STRATEGY HOUSEHOLD SURVEY 1995

3.1.1. BACKGROUND

Since 1985 a series of national surveys have been conducted to monitor tobacco, alcohol and illicit drug use as part of the National Drug Strategy. These surveys were conducted in 1985, 1988, 1991, 1993 and, most recently, in 1995. A central aim of these surveys has been to gather information about drug use and its consequences among the Australian population and to monitor changes in the prevalence of drug use over time.

3.1.2. METHOD

The 1995 survey was conducted by AGB McNair who conducted personal interviews with a total of 3,850 respondents aged 14 years or over from throughout Australia. Interviews were spread across all States and Territories and were conducted during the interval from May to June, 1995. The survey instrument included two separate interviews:

An interviewer administered questionnaire covering awareness of and attitudes towards drugs, perceptions of the drug problem and awareness of National Drug Strategy and related campaigns.

A confidential, sealed section completed personally by the respondent which contained questions on their own drug use behaviours.

A detailed discussion of the methods and procedures used in this survey has been provided previously (Commonwealth Department of Health and Family Services, 1996) and the data from this survey has been presented in a number of publications (e.g., Makkai & McAllister, 1997; 1998).

While the survey report presents results from a weighted sample, the analyses reported in this document are based on the unweighted sample of 14-19 years who were interviewed as part of the larger sample. The unweighted sample was chosen for analysis as one of the main weighting factors used in the analyses reported in the survey report was age. As the present analyses focus on only one age group, it is not necessary to weight the sample. Additionally, information specific to the 14-19 year age group that might be used for weighting is not readily available and back-weighting estimates for characteristics based on the entire population rather than specifically on 14-19 year olds could distort the study estimates. It should be noted that any variation in results introduced by the use of the non-weighted sample would not alter the substantive conclusions of this report.

3.2. THE AUSTRALIAN SCHOOL STUDENTS' ALCOHOL AND DRUGS SURVEY.

3.2.1. BACKGROUND

Since 1984 the Anti-cancer Council of Victoria has conducted a series of regular surveys of secondary school students to determine their tobacco and alcohol use. The most recent of these surveys, conducted in 1996, was expanded to include a number of questions on illicit drug use. A brief description of the methodology of this study is provided below.

3.2.2. SUBJECTS

In 1996 a representative sample of schools in all Australian States and the two territories participated in a survey of tobacco, alcohol and illicit drug use. A total of 31,529 students in years 7 to 12 were surveyed. Data from 29,850 male and female students aged between 12 to 17 years are used for this report. Data from the 1679 students outside this age range were excluded from the analyses reported here as their numbers were too small to ensure the reliability of any estimates calculated. The methods of sampling and data collection were identical to those used in the 1993 study (Hill, White, Williams & Gardner, 1993). They are described in detail elsewhere (Hill, White, Pain, & Gardner, 1990).

Schools enrolling students in Years 7 to 10 were sampled separately from those schools enrolling students in Years 11 and 12. Four hundred and fifty-eight secondary schools were selected to participate in the survey, of which 55 refused, giving a response rate of 88%. From a sample of replacement schools 29 of 52 schools approached agreed to take part in the study. A total of 432 schools participated in the study.

Schools drawn for the Years 7 to 10 sample supplied the school roll for all four year levels and 20 students (and 5 replacements) were randomly selected by a member of the research team from each of these year levels. Schools from the senior secondary sample supplied the roll for Years 11 and 12 and 40 students (and 10 replacements) were sampled from each of these years. As in the previous surveys, in states where Year 7 students in the Government system were included in the primary system (South Australia, Western Australia, Queensland and Northern Territory) the main primary feeder schools for the selected secondary school was identified and year 7 students were sampled from this school.

Due to specific needs of organisations participating in the New South Wales (NSW) component of the study, students from NSW were oversampled and are therefore over represented in the national data set. To bring the achieved sample into line with the population distribution the data were weighted, thus ensuring that disproportionate sampling of any State, school type, age and sex grouping did not bias the estimates. The prevalence estimates presented in this report are based on the weighted data.

3.2.3. PROCEDURE

Following the protocol established in previous surveys, in each state and the Northern Territory, members of the research team administered the pencil and paper questionnaire to groups of up to 20 students on the school premises. Students from different year levels were surveyed together. The presence of teachers during the survey was discouraged but 26% of students completed the questionnaire in the presence of teachers. This proportion varied with state ranging from a low of 4% in Victoria to a high of 56% in New South Wales, reflecting different education policies. The presence of a teacher during the survey was not associated with the proportion of students

reporting cannabis use in any of the recency time periods (last year, last month or last week). Students answered the questionnaire anonymously.

3.2.4. QUESTIONNAIRE

In 1996, the students completed a 22-page questionnaire. This questionnaire covered a variety of topics including demographics, tobacco, alcohol, cannabis, other illicit drug use and sun protection activities. The data presented in this report is based on responses to four questions about the students' history and experience of cannabis use.

Specifically, students were asked how many times, if ever, they had smoked or used marijuana: a) In the last week; b) In the last four weeks; c) In the last year; d) In their lifetime. Each question was rated on a seven point scale: 1 = none; 2 = Once or twice; 3 = 3-5 times; 4 = 6-9 times; 5 = 10-19 times; 6 = 20-39 times and 7 = 40 or more times.

4. Results

4.1 THE PREVALENCE OF CANNABIS USE

4.1.1 THE NATIONAL DRUG STRATEGY HOUSEHOLD SURVEY

The 1995 National Drug Strategy Household Survey included a total of 350 young people aged 14 to 19 years at the time of the survey. The percentage of respondents who reported that they had been offered or had the opportunity to use cannabis in the preceding 12 months, the percentage of respondents who reported ever having used cannabis and the percentage reporting having used cannabis in the 12 months preceding the interview are summarised in Table 2. The results in this Table suggest a number of general conclusions.

Firstly, many young people reported that they had either been offered or had the opportunity to use cannabis in the preceding 12 months: nearly half (47.7%) of all 14-19 years reported having access to cannabis in the preceding year and access to cannabis increased with increasing age. Just over a third of 14 year olds reported having been offered cannabis while nearly two thirds of 19 year olds reported that they had been offered cannabis.

Secondly, the results in Table 2 show that approximately 40% of the sample reported ever having used cannabis and approximately 30% reported having used the drug in the 12 months preceding the interview. Again, the prevalence of cannabis use increased with increasing age: 27.6% of 14 year olds reported that they had used cannabis and 22.4% reported having used cannabis in the preceding year. The corresponding figures for 19-year-olds were 56.4% and 43.6% respectively.

The results in Table 2 suggest that cannabis is widely available among Australian teenagers and that the use of cannabis is common: approximately a quarter of 14 year olds and just over half of 18-19 year olds reported that they had used cannabis at least once.

Table 2: The prevalence of lifetime cannabis use, cannabis use within the last year and weekly cannabis use among 14-19 year olds

Age (Years)	% Offered Cannabis in Last Year	% Ever Used Cannabis	% Used in Last Year[1]
14 Years	36.2	27.6	22.4
15 Years	36.7	26.7	21.7
16 Years	50.0	41.7	38.3
17 Years	49.2	40.7	28.8
18 Years	53.6	53.6	35.7
19 Years	61.8	56.4	43.6
14-19 Years	47.7	40.8	31.6

While the results in Table 2 establish that at least some use of cannabis is relatively common among adolescents, they provide no guidance as to the frequency or extent of cannabis use among this group. It is, however, possible to examine this issue in more detail as the National Drug Strategy Household Survey asked all respondents who reported having used cannabis to describe their frequency of cannabis use. Responses to this questioning are summarised in Table 3.

This Table shows that many young people who had used cannabis had done so only infrequently: 26.8% of young people who reported that they had used cannabis (11.1% of all respondents) reported that they no longer used the drug, 19.0% (7.7% of all respondents) reported that they used cannabis only once or twice in the past year and 29.6% (12.0% of all respondents) reported that they used cannabis once a month or less often. There were, however, a minority (23.9% of young people who reported having used cannabis; 9.7% of all respondents) who reported using cannabis on at least a weekly basis.

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[1] This column presents the percentage of each age group who reported cannabis use in the preceding 12 months. Thus, the figures differ markedly from those reported by Makkai and McAllister (1997) who reported the percentage of cannabis users aged 14-19 years old who had used cannabis in the preceding 12 months.

Table 3: The frequency of cannabis use among 14-19 year olds

Age (Years)	% Using Weekly or More Often	% Using Once/ Month or Once/ every few Months	% Using Once or Twice a Year or Less Often	% No Longer Using	% Never Used
14 Years	3.4	8.6	3.4	13.8	72.4
15 Years	10.0	8.3	5.0	3.3	73.3
16 Years	13.3	11.7	5.0	11.7	58.3
17 Years	6.8	11.9	6.8	15.3	59.3
18 Years	12.3	12.3	17.5	10.5	47.4
19 Years	14.3	19.6	8.9	12.5	44.6
14-19 Years	9.7	12.0	7.7	11.1	59.4

4.1.2 THE AUSTRALIAN SCHOOL STUDENTS' ALCOHOL AND DRUGS SURVEY

There was a total of 29,447 young people included in the analyses presented in this report. These sample members represented 93.4% of the total number of young people questioned as part of the Australian School Students' Alcohol and Drugs Survey. Exclusions from the analysis arose from incomplete data (1.5%) and the exclusion of those respondents who were aged either 11 years or younger (1.3%) or 18 years or older (3.8%) at the time of the survey. Figure 2 shows the lifetime prevalence of cannabis use among males and females by age (The raw data on which this Figure is based is presented in Appendix 3).

Figure 2: Percentage of males and females reporting use of cannabis in their lifetime by age
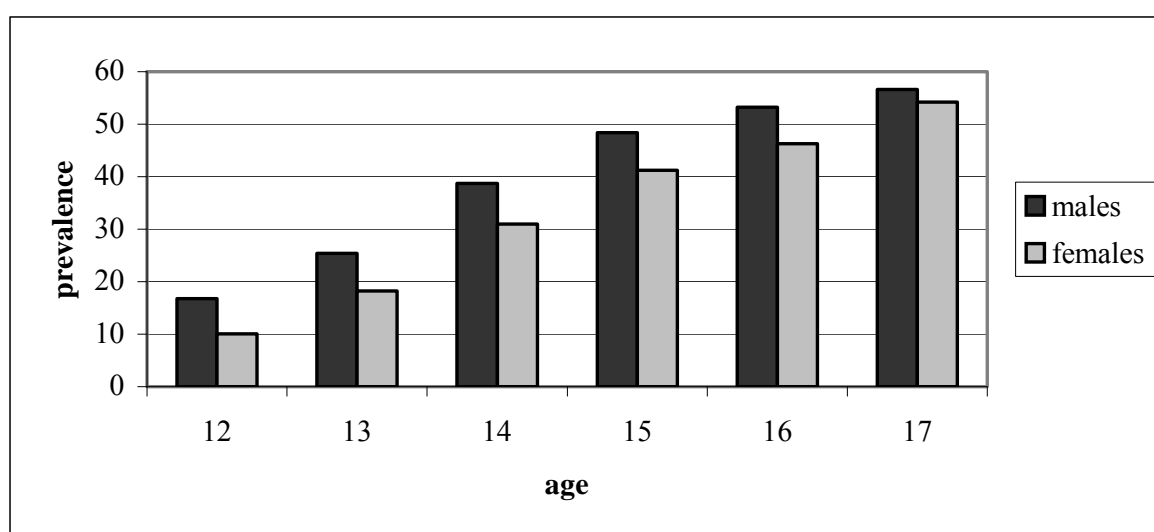
This figure shows that 36.4% of all respondents aged 12-17 years reported that they had used cannabis at least once. The prevalence of cannabis use increased with age, from 13.5% among 12 year olds to 55.4% among 17 year olds. Finally, there were significant (p<.001) gender differences in the rates of cannabis use, with males at all ages more likely to report cannabis use than females: 39.8% of all males aged 12 to 17 years old reported having used cannabis, compared with only 33.3% of females.

Table 4 summarises the prevalence of cannabis use in the past year; the past four weeks and the past week among survey respondents. Comparison of the results in this Table with those presented above indicates that the prevalence of cannabis use in shorter, more recent time frames was considerably lower than lifetime use. For example, 33.2% of all respondents aged 12 to 17 reported cannabis use in the past year; 19.9% reported cannabis use in the past four weeks and 12.1% reported cannabis use in the past week. The results presented in this Table show significant (p < .001) gender differences in the frequency of cannabis use: males were more likely than females to report having used cannabis in the past year (35.2% versus 29.8%), in the past four weeks (22.5% versus 16.8%) and in the past week (14.7% versus 9.2%). Finally, across all time frames the prevalence of reported cannabis use increased with increasing age.

Table 5 summarises the extent of cannabis use in the past year, the past four weeks and the past week among all survey respondents aged 12-17 years. The data from all respondents age 12 -17 years has been combined for ease of presentation. The results of this Table show that the majority of young people who reported cannabis use did so on a few occasions. For example, while 34.5% of males had used cannabis in the past year, 43% of those reporting cannabis use (14.8% of all males in the survey) reported that they had used cannabis on five or fewer occasions throughout the 12 month period. Similarly, while 15.4% of females reported having used cannabis in the four weeks preceding the survey, approximately 45% (7% of all females in the survey) had used cannabis only once or twice during that period.

A small minority of the sample reported relatively frequent use of cannabis. For example, while 65.5% of males and 70.7% of females had not used cannabis in the preceding year, 6.8% of males and 3.1% of females reported that they had used it on 40 or more occasions during that period. Similarly, while 86.3% of males and 91.3% of females reported that they had not used cannabis in the previous week, 4% of males and 1.4% of females reported that they had used the drug on six or more occasions during the past week.

Again, there were significant (p<.001) gender differences in the intensity of cannabis use with males reporting more frequent cannabis use than females for each of the three time periods studied. For example, more males than females reported having used cannabis on at least 10 occasions in the past year (15.4% versus 10.4%), the past four weeks (6% versus 2.5%) and the past week (2.4% versus 0.6%).

Table 4: Rates (%) of cannabis use in the past year, the past four weeks and the past week among males and females by age.

AGE	% Using Cannabis in Past Year		% Using Cannabis in Past Four Weeks		% Using Cannabis in Past Week	
	Males	Females	Males	Females	Males	Females
12 Years	13.0	8.1	7.5	3.5	4.6	1.9
13 Years	21.4	15.7	12.5	8.9	7.7	5.1
14 Years	34.1	27.8	22.2	16.9	13.9	9.0
15 Years	44.1	38.5	29.3	23.0	19.4	12.8
16 Years	48.3	42.1	32.2	24.9	22.0	13.0
17 Years	49.0	47.5	29.6	22.1	20.1	13.0
12-17 Years	35.2	29.8	22.5	16.8	14.7	9.2

Table 5: Rates (%) of cannabis use in the past year, the past four weeks and the past week among males and females.

Frequency of Cannabis use	% Using Cannabis in Past Year		% Using Cannabis in Past Four Weeks		% Using Cannabis in Past Week	
	Males	Females	Males	Females	Males	Females
Not Used	65.5	70.7	79.6	84.6	86.3	91.3
Once or Twice	9.4	9.2	7.4	7.0	6.7	5.2
3-5 Times	5.4	5.7	4.2	3.8	3.1	2.0
6-9 Times	4.2	3.9	2.8	2.2	1.6	.8
10-19 Times	4.7	4.3	2.8	1.5	1.2	.4
20-39 Times	3.9	3.0	1.6	.6	.4	.1
40 + Times	6.8	3.1	1.6	.4	.8	.1

4.2 COMPARISONS WITH PREVIOUS STUDIES

Table 6 compares estimates of the prevalence of cannabis use among youth derived from the Australian School Students' Alcohol and Drugs Survey with estimates from previous regionally based surveys. The first column shows the prevalence of lifetime cannabis use among all respondents in the Australian School Students' Alcohol and Drugs Survey. Prevalence estimates are shown separately for each age from 12 to 17 years of age. Subsequent columns of the Table show the corresponding estimates of the prevalence of cannabis use derived from previous surveys of school aged youth including: a) a 1988 survey of 3036 South Australian school students in years 7 to 11 (Christie et al, 1990); b) a survey of 3753 New South Wales school students conducted in 1989 (Donnelly et al, 1990); c) a 1992 survey of 3828 New South Wales School students (Cooney, Dobbinson & Flaherty, 1994).

These results suggest there may have been an increase in the prevalence of cannabis use among youth in recent years. Specifically, previous surveys have estimated that approximately 25% of young people aged 12 - 17 years have used cannabis whereas estimates from the Australian School Students' Alcohol and Drugs Survey suggest that 36.4% (95% CI = 35.9%-36.9%) of youth aged 12-17 years had used cannabis. Additionally, estimates of the prevalence of cannabis use among youth of different ages were consistently higher in the more recent national survey.

Table 6: Comparison of reported rate (%) of lifetime cannabis use from selected surveys

Age (years)	1996 National school students survey	1989 NSW School Students Survey	1988 South Australian Survey	1992 NSW School Students Survey
12	13.5	4.9	5.6	8.4
13	21.9	10.4	10.1	14.2
14	34.5	22.1	21.1	25.9
15	44.9	26.6	32.4	33.1
16	49.7	30.7	41.7	42.6
17	55.4	32.6	-	36.7
12-17	36.4	25.4	-	25.4

4.3 THE CONTEXT OF CANNABIS USE

While the Australian School Students' Alcohol and Drugs provides excellent data on the prevalence and extent of cannabis use, it provides limited information on the context of cannabis use. However, respondents in the National Household Survey who reported using cannabis during the preceding 12 months were asked a series of further questions about their most common method of using cannabis (e.g., smoking, ingestion), what type of cannabis they most commonly used (e.g., leaf, heads) and where they used marijuana. The answers to these questions are summarised in Tables 7, 8 and 9 respectively.

4.3.1 METHOD OF USING CANNABIS

Table 7 shows that, among young people who reported using cannabis (n= 141) the majority (87.4%) reported that they most commonly smoked from a pipe or bong while a small minority (11.7%) reported smoking joints. Only 1% reported that they usually swallowed the drug.

Table 7: Self reports of most common method for using cannabis among young people reporting cannabis use

Age (years)	N	% Smoking "joints"	% Smoking from pipe or "bong'	% Ingesting (e.g., cookies)
14 years	8	12.5%	87.5%	0.0%
15 years	14	7.1%	85.7%	7.1%
16 years	18	5.6%	94.4%	0.0%
17 years	15	20.0%	80.0%	0.0%
18 years	24	12.5%	87.5%	0.0%
19 years	24	12.5%	87.5%	0.0%
14-19 years	103	11.7%	87.4%	1.0%

4.3.2 TYPES OF CANNABIS USED

Table 8 shows that the most commonly used form of cannabis was heads although the use of leaf was relatively common as well. Small minorities of the sample reported the use of other forms of cannabis including resin, oil or skunk. It should be emphasised that these data refer to what type of marijuana was *most commonly* used. The results do not necessarily mean that young people who reported smoking leaf (for example) used this form of cannabis exclusively.

Table 8: Type of Cannabis Most Commonly Used by Respondents

Age (years)	n	% Using Leaf	% Using Heads	% Other
14 years	8	25.0%	50.0%	25.0%
15 years	14	14.3%	71.4%	14.3%
16 years	18	16.7%	72.2%	11.2%
17 years	16	18.8%	62.5%	18.8%
18 years	24	20.8%	66.7%	12.6%
19 years	24	12.5%	70.8%	16.7%
14-19 years	104	17.3%	67.3%	15.4%

4.3.3 LOCATIONS WHERE CANNABIS WAS USED

Finally, respondents were asked to describe where they use cannabis. They were not limited to naming the place where they most often smoked but were able to nominate any number of places where they used cannabis. Responses to these questions are summarised in Table 9. Survey respondents reported using cannabis in a variety of locations including their own homes, their friends' homes and at parties. Cannabis use was also reported to occur relatively frequently in cars or other vehicles and in parks or in public places.

Table 9: Location where cannabis use was reported to occur.

Location	% of Cannabis Users (n = 104)[2]
Own Home	35.6%
Friend's House	73.1%
At Parties	84.6%
At School (or University)	9.6%
In Public Places(e.g., Parks)	28.8%
In a Car or Other Vehicle	38.5%
Other Places	20.2%

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[2] Note that these percentages add to more than 100, as respondents were able to nominate multiple places where they would use cannabis.

4.6 OTHER DRUG USE AMONG THOSE WHO USE CANNABIS

While cannabis use is often considered in isolation from other substance use, there has been increasing recognition of multiple substance use among adolescents. The following section describes patterns of other substance use (both licit and illicit) among adolescent cannabis users using two separate approaches. In the first section, an analysis is presented which summarises data from the National Household Survey on the concurrent use of alcohol with cannabis. The second section compares patterns of tobacco, alcohol and illicit drug use among young people who did and did not report using cannabis.

4.6.1 THE CONCURRENT USE OF ALCOHOL

All survey respondents who reported having used cannabis during the 12 months preceding the interview were asked whether they had used alcohol concurrently with the use of cannabis on any occasion during that period. Answers to this question, summarised in Table 10, suggest the following conclusions. Firstly, the concurrent use of cannabis and alcohol was common, with 66.3% of those who had used cannabis in the preceding 12 months reporting that they had used cannabis and alcohol simultaneously. Secondly, clear age differences in the frequency of concurrent alcohol and cannabis use are apparent. Only 37.5% of 14 year olds who used cannabis reported the concurrent use of alcohol while 87.5% of 19 year olds reported the concurrent use of both alcohol and cannabis. Given that the concurrent use of alcohol has been shown to amplify both the health and behavioural effects of cannabis, these results are of clear importance and suggest fruitful avenues for harm minimisation.

Table 10: Concurrent use of alcohol and cannabis among respondents who reported cannabis use in the preceding 12 months

Age	Number Reporting Cannabis Use in Past Year	% Reporting Concurrent Use of Alcohol
14 years	8	37.5%
15 years	14	64.3%
16 years	18	66.7%
17 years	16	56.3%
18 years	24	66.7%
19 years	24	87.5%
14-19 years	104	66.3%

4.6.2 PATTERNS OF TOBACCO, ALCOHOL AND ILLICIT DRUG USE AMONG CANNABIS USERS AND REMAINING SURVEY RESPONDENTS.

In other sections of the survey all respondents were asked to describe their use of tobacco, alcohol and other illicit drugs, including steroids, ecstasy, amphetamines and opiates. Based on responses to this questioning it was possible to construct the following measures of substance use among the sample members:

1. Tobacco use. Two measures of tobacco use were employed in the current analyses: a) whether the young person reported ever having been a regular smoker; and b) whether the young person reported currently smoking on a regular basis.

2. Alcohol Use. While a variety of measures of alcohol use were available in the data base the following measures were selected for inclusion in the present analyses: a) Whether or not the young person reported that they typically drank alcohol at least one day a week; b) Whether or not the young person reported that they typically consumed at least 7 standard drinks of alcohol.

3. Illicit Drug Use. Respondents were asked whether they had ever used any of the following illicit drugs: tranquillisers or pills for non-medical purposes (2.0%); steroids (0.6%); barbiturates (1.4%); heroin (0.9%); amphetamines (3.4%); cocaine (0.9%); naturally occurring hallucinogens (3.7%); LSD (6.9%); ecstasy or other designer drugs (1.7%) and inhalants (5.4%). Finally 2.0% of respondents reported that they had injected an illicit drug.

Due to the low base rate of use of each of these substances, it was not feasible to analyse the data on each type of illicit drug use. Instead, a measure of illicit drug use was constructed by summing the number of persons who had used one or more of these drugs. A total of 14.9% of all respondents aged 14-19 years reported the use of at least one of these substances.

Analyses contrasting patterns of tobacco, alcohol and illicit drug use among young people who reported having used cannabis and remaining survey respondents are summarised in Table 11. For each of these two groups, the Table shows the percentages of young people who: a) reported ever having been a regular smoker; b) reported currently being a regular smoker c) reported that they typically drank alcohol on at least one day in each week; d) reported typically consuming the equivalent of at least 7 standard drinks of alcohol; and e) reported illicit drug use. Tests of the significance of the association between cannabis use and each of these drug use categories were conducted using the chi-squared test and the strength of the association between cannabis use and other drug use is assessed using the odds ratio. The results in this Table lead to a clear and consistent set of conclusions: Compared with remaining survey respondents, young people who reported having used cannabis had elevated rates of tobacco, alcohol and illicit drug use. The odds ratios between cannabis use and the use of these drugs varied from 7 to 12 and in all cases were statistically significant (p<.001).

Table 11: Tobacco, Alcohol and Illicit drug Use among Cannabis Users and Remaining Survey Respondents Aged 14-19 Years.

Other Drug Use	Cannabis Users	Remaining Survey Respondents	Odds Ratio (95% CI[3])	Significance
% Ever Smoked Regularly	43.7	5.8	12.5 (6.4-24.5)	<.001
% Currently Smoking Regularly	30.3	5.3	7.7 (3.8-15.6)	<.001
% Drinking Alcohol at Least 1 Day/ Week	39.4	6.8	8.9 (4.7-16.9)	<.001
% Drinking at Least 7 Drinks/ Day	24.6	3.4	9.3 (4.0-21.6)	<.001
% Reporting Use of Other Illicit Drugs	31.7	3.4	13.2 (5.7-30.3)	<.001

These conclusions have been supported by the results of analyses based on data from the Australian School Students' Alcohol and Drugs Survey (Lynskey et al, submitted). Specifically, compared with remaining sample members, young people who reported regular cannabis use were: 13 times more likely to report the use of other illicit drugs; 6 to 8 times more likely to drink alcohol regularly or to consume large quantities of alcohol and 14 times more likely to be committed tobacco smokers.

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[3] 95% CI refers to the 95% Confidence Interval of the estimated odds ratio.

5. Discussion

The preceding analyses have presented results from both the National Drug Strategy Household Survey (1995) and the 1996 Australian School Students' Alcohol and Drugs Survey on patterns and correlates of cannabis use among youth. The major findings of these analyses and their implications are discussed below.

5.1 THE PREVALENCE OF CANNABIS USE

In common with the findings of a number of previous studies that have examined the prevalence of cannabis use among Australian youth, the present analyses suggested that a substantial minority of young people had used cannabis on at least one occasion. The prevalence of cannabis use among respondents in the National Drug Strategy Household survey aged 14-19 years was in the region of 40%. Not surprisingly, the lifetime prevalence of cannabis use increased with increasing age from 25% of 14 year olds to 55% of 19-year-old respondents. Many young people who reported cannabis use were using cannabis infrequently and at levels that were unlikely to have any serious long-term sequelae. There was, however, a small minority of teenagers who reported near daily use of cannabis. Similarly, among respondents from the Australian School Students' Alcohol and Drugs Survey 36.4% of all youth aged 12-17 years reported that they had used cannabis on at least one occasion. The majority of those who reported cannabis use had used the drug on only a few occasions although a small minority (4% of males and 1.4% of females) reported using cannabis on at least six occasions in the past week. Additionally, there were both age and gender differences in rates of cannabis use: with increasing age students were more likely to report cannabis use while at all ages males were more likely than females to report lifetime and regular cannabis use.

There is an important caveat that should be placed on the preceding results. Specifically, it is probable that the prevalence estimates obtained by these surveys, and previous surveys of adolescent drug use, under estimate the true prevalence of cannabis use among adolescents. This will occur because both the sampling procedure and differential sample refusal are likely to lead to an under-representation of drug users in the sample. Specifically, the sampling procedures exclude a number of high-risk groups, such as the homeless and those not attending school, from the survey. It is also likely that some young people who have used cannabis would conceal this behaviour, despite reassurances of confidentiality.

These issues are not unique to the current surveys. An ongoing issue in the literature on substance use concerns the extent to which it is possible to obtain valid and reliable measures of alcohol, tobacco and illicit drug use (Gillies, 1985; Jarvis, Tunstall-Pedoe, Feyeraband, Vesey & Saloojee, 1987; Midanik, 1988; Rouse, Kozel & Richards, 1982). While many studies have concluded that adolescent self-reports of substance use are, in general, both reliable and valid (Murray & Perry, 1987; Needle, McCubbin, Lorence & Hochauser, 1983; Stacy et al, 1990), efforts have been made to increase the reliability of self reports and to estimate the error variance in self reported substance use (Patrick et al, 1994).

Fergusson and Horwood (1989) have suggested that measurement errors in self reports of substance use are likely to be systematic because it is more likely that some subjects will conceal

their substance use than it is that non users will claim to be users. The existence of such a systematic error in report data has two consequences for studies of adolescent substance use: a) they will underestimate the true prevalence of substance use within the community and; b) they may lead to the miss-estimation of the contribution of risk factors to substance use behaviours (Fergusson & Horwood, 1989).

5.2. HAS THERE BEEN AN INCREASE IN CANNABIS USE AMONG AUSTRALIAN YOUTH?

Many of the concerns expressed about youth cannabis use are often predicated on the view that the use of this drug has increased in recent years. However, the evidence for such an increase is less than certain. Comparison of the results from the Australian School Students' Alcohol and Drugs Survey with previous studies conducted throughout Australia suggested that there may have been an increase in the rate of cannabis use among youth in recent years. Specifically, rates of lifetime use of cannabis reported in this study, conducted in 1996, were detectably highly than the corresponding rates reported by studies conducted in the late 1980's and early 1990's.

As discussed previously, there are, however, a number of difficulties in interpreting this information. Specifically, the different studies used as the basis of this comparison differed not only in the year in which they were conducted, they also employed different questionnaire formats and different sampling frames. To the extent that the studies employed different methodologies, it is possible that any difference in the prevalence estimates derived from the different studies are an artifact of the differing methodologies and do not reflect a true change in the rate of cannabis use among youth. Nonetheless, the evidence presented here suggests that there has been such an increase in recent years. It should also be noted that this evidence has been paralleled by evidence from the National Household Surveys that there has been an increase in the 12-month prevalence of cannabis use among youth (Williams, 1997). The release of data from the recently completed 1998 National Household Survey should help clarify the extent to which the prevalence of cannabis use among Australian youth has increased. Given this apparent increase in cannabis use, it is important that continued efforts be made to monitor the prevalence and extent of cannabis use among youth on a national basis.

Such monitoring is routinely conducted in the United States as part of the Monitoring Future Project (Johnston et al, 1996). This project has collected information from large, representative samples of schoolchildren for each year from 1975 to 1995. Recent findings from this project have suggested that there has been an increase in cannabis use among American youth since 1991. Specifically, during this interval the lifetime prevalence of cannabis use amongst 8th graders rose from 10.2% to 19.9%; amongst 10th graders it rose from 23.4% to 34.1% and amongst 12th graders it rose from 47.6% to 51.5% (Johnston et al, 1996). There are clear parallels between these findings and the increase in rates of cannabis use among Australian youth. These findings are paralleled by other indications that illicit drug problems are not unique to Australia. For example, the dramatic rise in the rate of mortality from unintentional opiate overdose in Australia in recent years (Hall & Darke, 1997; Lynskey & Hall, 1998) has been paralleled by increasing rates of overdose in a number of other countries including the Nordic countries (Steentoft et al, 1996), Spain (de la Fuente, 1995; Sanchez et al, 1994), Italy (Davoli et al, 1997), Austria (Risser & Schneider, 1994), the United States (United States Department of

Health and Human Services, 1997) and England and Wales (Neeleman & Farrell, 1997). These international comparisons indicate that any increase in cannabis use among youth, and drug related harm in general, is not unique to Australia and therefore should not be attributed to local policies or conditions.

Related to this issue, there have been concerns expressed about the extent to which the Cannabis Expiation Notice in South Australia, which partially decriminalises the drug in that state, may have led to increased use of the drug among youth. This issue has been explored at length by Donnelly, Hall and Christie (1995) who used National data collected at regular intervals over the period from 1985 (before the introduction of the Cannabis Expiation Notice in South Australia) and 1993. Although their analysis did not deal specifically with cannabis use among youth but looked instead at cannabis use among adults of all ages their analysis lead to two major conclusions.

Firstly, that rates of cannabis use among the general population had increased over the period of the study. These findings clearly add weight to the speculation that there has been a corresponding increase in cannabis use among youth in recent years. Secondly, the analyses reported by Donnelly et al (1995) provided no evidence to suggest that the Cannabis Expiation Notice in South Australia had caused an increase in cannabis use in that state. Specifically, while there had been an increase in both the lifetime use of cannabis and current weekly cannabis use in South Australia over the time of the study, the increase observed in South Australia was not significantly greater than the increase observed in other Australian states which had not enacted legislation to partially decriminalise cannabis. However, as Donnelly et al (1995) note, the extent to which these results apply specifically to adolescents and young people remains open to debate and there is a need for further large scale surveys of illicit drug use among adolescents and young people to examine trends in rates of cannabis use among adolescents and young adults.

5.3 RISK FACTORS FOR THE DEVELOPMENT OF SUBSTANCE USE

Given the widespread and apparently increasing use of cannabis among youth, it is appropriate to consider the extent to which it may possible to identify young people at increased risk of substance use. This issue has received considerable attention in the research literature and a wide range of social, family, individual and peer factors have been identified as risk factors for cannabis use. While it was not possible to explore this issue using the current data sets, there is a large research literature, a brief summary of which follows.

5.3.1 SOCIAL AND CONTEXTUAL FACTORS

A broad a range of social and contextual factors have been shown to be associated with substance use and misuse. For example, availability has been shown to be a moderate predictor of rates of tobacco, alcohol and illicit drug use (Dembo, Farrow, Schmeidler & Burgos, 1979; Gorsuch & Butler, 1976; Maddahain, Newcomb & Bentler, 1988). The use of these substances is also influenced by both laws and norms concerning their use. In particular, alcohol consumption has been shown to be affected by the amount of tax placed on alcohol (Levy & Sheflin, 1985). Lowering the age at which young people can legally drink has been shown to increase drinking and driving while increasing the minimum drinking age has been shown to reduce drink-driving convictions among teenagers (Saffer & Grossman, 1987).

5.3.2 FAMILY FACTORS, FAMILY FUNCTIONING AND FAMILY SUBSTANCE USE

The literature on adolescent substance use behaviours has identified a broad array of family factors which are associated with increased rates of tobacco, alcohol and illicit drug use during adolescence. These measures have included: a) family functioning including parent-child interaction and the quality of parent-child relationships (Braucht et al, 1978; Brook et al, 1980; 1986; Cohen et al, 1994; Hundelby & Mercer, 1987; Jessor & Jessor, 1977; Kandel et al, 1978; Norem-Hebeisen et al, 1984; Penning & Barnes, 1982; Selnow, 1987), parental divorce and parental conflict (Doherty & Needle, 1991; Fergusson, Horwood & Lynskey, 1994a; Flewelling & Bauman, 1990; Needle et al, 1990), family management practices and family dysfunction; b) parental and sibling substance use (Bailey et al, 1993; Barnes & Welte, 1986; Bohman, et al, 1981; Brook, Brook, Gordon, Whiteman & Cohen, 1990; Brook, Gordon, Whiteman & Cohen, 1986; Charlton & Blair, 1989; Chassin et al, 1984; 1986; Johnson et al, 1984; Johnson et al, 1989; Lynskey, Fergusson & Horwood, 1994; McDermott, 1984; Murray et al, 1983; Rydelius, 1983; Semmer et al, 1987; Von Knorring, 1991).

5.3.3 EARLY BEHAVIOURAL TENDENCIES AND EARLY EXPERIMENTATION WITH SUBSTANCE USE

A broad array of individual factors, assessed during early childhood has been shown to be associated with increased rates of substance use behaviours during adolescence and young adulthood. These factors have included: a) personality such as high novelty seeking (Cannon et al, 1993; Cloninger et al, 1988; Heath & Madden, 1993 (cited in Cloninger et al, 1994); Pomerleau et al, 1992; Wills et al, 1994) and sensation seeking (Earleywine & Finn, 1991; Lipkus et al, 1994; Pederson, 1991; Thombs et al, 1994); b) early behavioural tendencies, particularly tendencies to disruptive and troublesome behaviours during childhood (Fergusson, Lynskey & Horwood, 1993; Gittelman et al, 1985; Lerner & Vicary, 1984; Robins, 1978; Lynskey & Fergusson, 1995; Block et al, 1988; Brook, Whiteman, Gordon & Cohen, 1986; Newcomb et al, 1986; Shedler & Block, 1990; Windle, 1990); c) school related factors including intelligence, school performance and commitment to education (Bewley & Bland, 1977; Bewley et al, 1974; Chassin et al, 1984) and; d) early substance use including the age of first experimentation with substances (Brunswick & Boyle, 1979; Fergusson, Lynskey & Horwood, 1994; Fleming et al, 1982; Kandel, 1982; Kandel et al, 1976; O'Donnell & Clayton, 1979; Rachal et al, 1982; Robins and Pzybeck, 1985; Schukit & Russell, 1983).

5.3.4 PEER AFFILIATIONS DURING ADOLESCENCE

Finally, the extent to which the individual affiliates with delinquent or substance using peers during adolescence has emerged in a large number of studies as being one of the strongest predictors of adolescent substance use behaviours tobacco (Barnes & Welte, 1986; Botvin et al, 1992; Brook et al, 1990; Castro et al, 1987; Dielman et al, 1991; Elliot et al, 1985; Fergusson, Horwood & Lynskey, 1995; Fergusson, Lynskey & Horwood, 1995; Kandel & Andrews, 1987; Stanton & Silva, 1991; Urberg et al, 1991). While the nature of the relationship between peer affiliations and adolescent substance use remains controversial, the weight of the evidence clearly favours the view that peer affiliations during adolescence are an important determinant of substance use, independently of individual and family factors.

While these risk factors make independent net contributions to risks of substance use, it is important to emphasis that, by themselves, each makes a relatively small contribution to this risk. An emerging finding is that exposure to these various disadvantages is often highly inter-related so that the young person who develops early onset substance use problems is often characterised by multiple social and family disadvantages (Newcomb et al, 1986).

5.4 THE LINKS BETWEEN CANNABIS USE AND OTHER DRUG USE

The results of the present analyses indicated that: a) cannabis is often used in conjunction with alcohol and; b) young people who use cannabis are also more likely to: use tobacco on a regular basis, drink large quantities of alcohol more and use other illicit drugs. Again, these results are in broad agreement with a number of previous studies (e.g., Bailey, 1992; Chen & Kandel, 1995; Donovan & Jessor, 1985; Kandel, 1975; Kandel & Faust, 1975; Kandel, Yamaguchi & Chen, 1992; Sobell et al, 1990; Welte & Barnes, 1987). They have a number of important implications for intervention and prevention.

Firstly, the finding that cannabis is often used concurrently with alcohol is important to the extent that a number of previous studies have shown that both the physical and behavioural effects of cannabis use are heightened by the concurrent use of alcohol (Hall et al, 1994).

Secondly, the results of this and other studies that have demonstrated that cannabis use is often associated with tobacco, alcohol and illicit drug use suggests that intervention and prevention programs should not focus solely on cannabis (or any substance) but should be broad based and attempt to reduce rates of substance use in general. A number of potential prevention strategies are discussed in Section 5.6.

5.5 THE CONSEQUENCES OF ADOLESCENT CANNABIS USE

An important issue raised by adolescent cannabis use has been the extent to which early use of cannabis is causally linked poor mental health, substance abuse and dependence, criminal offending, poor educational attainment and reduced life opportunities. There have been a number of cross sectional studies which have shown that risks of these various adverse outcomes are elevated in young people who use cannabis (Donovan & Jessor, 1985; Farrell, Danish & Howard, 1992; Fergusson, Horwood & Lynskey; 1994b; Gillmore et al, 1991; Grube & Morgan, 1990; McGee & Newcomb, 1992). For example, Fergusson, Horwood and Lynskey (1994b) reported highly significant associations between early onset cannabis use (before age 15 years) and alcohol abuse (OR = 13.8; 95% CI = 6.2-30.4), precocious sexual activity (OR = 20.1; 95% CI = 11.1-36.5), conduct disorder (OR = 12.5; 95% CI = 7.1-22.1) and criminal offending (OR = 5.0; 95% CI = 2.7-9.0).

The precise mechanisms that produce these observed associations remain controversial. There are essentially three broad explanations of the observed associations between cannabis use and adverse psychosocial outcomes:

1. Firstly, Kandel, Davies, Karus &Yamaguchi (1986) have proposed that early cannabis use causally influences later risks of substance abuse/ dependence, criminal offending, poor mental health and reduced life opportunities. They argue that early cannabis use encourages later use of the drug and illicit drug use, and has a direct influence on anti-conventional behaviours including increased risks of delinquency, employment problems and difficulties in interpersonal relationships. Kandel et al (1986) suggest that these consequences will vary with the extent of the individual's use of the drug.

2. Alternatively, it has been proposed that the cannabis use is, in fact, caused by reduced life opportunities and, in particular, poor mental health. This perspective, commonly known as the self medication hypothesis, has been supported by findings that many drug users report that their drug use helped them to feel "normal" (Khantzian, 1986).

3. Finally, it could be argued that the associations between early cannabis use and other adverse outcomes in adolescence and young adulthood arise from the effects of common life circumstances and risk factors that increase risks of both early cannabis use and other adverse psychosocial outcomes. There is considerable indirect evidence to support this hypothesis in that the risk factors and life pathways that have been shown to be associated with early cannabis use overlap considerably with the risk factors and life pathways that are associated with poor mental health, criminal offending and reduced life opportunities. These risk factors have been reviewed by a number of authors and include: the extent to which the norms and attitudes of the wider community encourage or discourage the use of drugs; social disadvantage and family dysfunction; individual factors including personality and an individuals' generalised propensity to norm violating behaviours; and the extent to which an individual affiliates with delinquent or substance using peers (for reviews of this evidence see Hawkins et al, 1992; Kandel, 1980; Newcomb & Bentler, 1989).

While the linkages between early cannabis use and other adverse outcomes remain controversial, little published research adequately addresses the origins of these linkages. The only way to

adequately investigate the origins of these linkages is through the use of longitudinal designs that measure cannabis use and other outcomes at multiple time points throughout adolescence and young adulthood. One such study by Fergusson, Lynskey and Horwood (1996) examined the extent to which cannabis use before the age of 15 years had adverse consequences for subsequent offending, mental health and life opportunities, assessed 12 months later. It was able to take account of the effects of a wide range of potentially confounding factors. The results of this study lead to the following conclusions.

1. Firstly, sample members who had used cannabis by the age of 15 years (approximately 10% of the sample) had significantly elevated risks of a range of adverse outcomes by the age of 16 years including substance misuse, delinquency, school problems and poor mental health.

2. While these results suggest that early onset cannabis use causally influenced an individuals risks of subsequent adverse outcomes, it was also the case that young people who reported early onset cannabis showed early tendencies to delinquency, had poor mental health, were educational underachievers, affiliated with delinquent or substance using peers, and had a history of family dysfunction.

3. To examine the effects of early onset cannabis use on subsequent outcomes after the effects of these potentially confounding covariates had been taken into account, Fergusson et al (1996) fitted a series of logistic regression models to the data in which the log odds of each outcome assessed at age 16 years was modelled as a function of the individual's cannabis use at age 15 and each of the potentially confounding covariates. The results of this analysis indicated that, after the effects of covariates had been taken into account, the associations between early cannabis use and later outcomes were dramatically reduced. Indeed, after such adjustment, the associations between early onset cannabis use and the majority of the outcomes studied were no longer statistically significant, indicating that early cannabis use did not causally influence later risks of a range of adverse outcomes including alcohol misuse, daily tobacco use, conduct disorder, self report offending, anxiety disorders, depression and suicidal ideation.

4. However, there were still statistically significant associations between early onset cannabis use and later risks of cannabis use ($p<.0001$) and school dropout ($p<.05$) after confounding variables had been statistically controlled. In particular, young people who used cannabis before the age of 15 years were 6.7 (95% CI = 3.4 to 13.3) times more likely to be using cannabis at age 16 years and 3.1 (95% CI = 1.2 to 7.9) times more likely to have left school before the age of 16 years, the minimum school leaving age in New Zealand. Additionally, there were marginally significant associations ($p<.10$) between early onset cannabis use and both police contact and frequent truancy: after control for confounding covariates, young people who had used cannabis by the age of 16 years were 2.1 (95% CI = 0.9-4.8) times more likely to have been in contact with the police during the interval from 15 to 16 years and 2.0 (95% CI = 1.0-4.2) times more likely to report frequent truancy during this period.

A subsequent follow-up of the same cohort examined the influence of early onset cannabis use, defined as occurring before the age of 16 years, on a range of outcomes assessed at age 18 (Fergusson and Horwood, 1997). Results showed that young people who had used cannabis by the age of 16 years were at increased risks for a range of adverse outcomes by age 18. These included substance abuse or dependence, juvenile offending, mental health problems and reduced

life opportunities, including leaving school with no formal school qualifications, and being unemployed. The linkages between early onset cannabis use and these outcomes were largely, although not wholly, explained by two mechanisms. Firstly, young people who had used cannabis by the age of 16 years were characterised by disadvantageous social, family and individual circumstances that, independently of their cannabis use, placed them at increased risks of experiencing adjustment problems at age 18 years. Secondly, the early use of cannabis was associated with a range of life choices, including affiliating with delinquent or substance using peers, moving away from home and ceasing education, which were, in turn, associated with increased psychosocial risks. In discussing these results Fergusson and Horwood (1997; page 294) concluded:

> "It would be misleading .... to argue too strongly that cannabis use by young people is a factor that leads to seriously increased risks of psychosocial disorder in adolescence. Most of the elevated risk seen among early onset cannabis users is likely to arise from factors that were antecedent to the decision to use cannabis, rather than as a consequence of cannabis use. Nonetheless, early onset usage is not without risks and those engaging in these behaviours may be more vulnerable to later psychosocial problems as a result of the social context within which cannabis is used and obtained."

In conclusion, the results of these studies indicate that young people who use cannabis are at increased risks for a wide range of adverse and potentially harmful outcomes including other substance use and abuse, criminal behaviour, poor mental health, impaired educational achievement and reduced life opportunities. Available evidence suggests that a large part of these associations arise because the risk factors and life pathways that predispose young people to cannabis use overlap with the risk factors and life pathways that place young people at increased risks of these other outcomes. However, there is also evidence to suggest that early cannabis use acts to place young people at (mildly) elevated risks of some negative outcomes, and particularly increased substance use behaviours. A potential mechanism underlying these associations is that early cannabis use is accompanied by adoption of an unconventional lifestyle characterised by increased affiliations with delinquent or substance using peers and disengagement from conventional social structures including education and employment (Fergusson & Horwood, 1997).

These results have a number of implications for the prevention of both early substance use and other problems of adjustment. Firstly, to the extent that early cannabis use often occurs in the context of other adversities, prevention efforts should be broadly targeted at preventing a range of adverse outcomes rather than focussing on the specific outcome of cannabis use. Secondly, the results suggest that the elimination or reduction or adolescent cannabis use would, by itself, have relatively little impact on the frequency and extent of other problems of adjustment including criminal offending, mental health problems, precocious sexual activity, educational failure and reduced life opportunities. A more detailed discussion of the implications of these findings for prevention, and possible opportunities for prevention is provided below.

5.6 Implications for Prevention and Treatment

The findings on the prevalence of cannabis use reported here confirm the findings of previous studies that cannabis use typically first occurs during early adolescence (Kandel, 1982). These results strongly suggest that education and prevention strategies aimed at reducing the use and misuse of these substances need to start during the middle school years. The finding that many young people have already started to experiment with cannabis during adolescence indicates a need to commence prevention efforts with children at even younger ages than this. Thus, as Glynn (1993) has commented, while many tobacco use prevention programmes have been introduced at 12, 13 or 14 years of age, it appears that intervening at this age may not be as useful as intervening at earlier ages. There are at least two principal reasons why it may be important to intervene at earlier ages (Glynn, 1993): Firstly, there is evidence that the earlier an individual commences smoking, the more they will smoke as an adult, and the greater is the risk of developing lung cancer (Taioli & Wynder, 1991). Similarly, the earlier an individual commences drinking alcohol or using illicit drugs, the greater the risks of developing alcohol and drug problems in later life (Escobedo et al, 1993; Fergusson, Lynskey & Horwood, 1994; Hawkins et al, 1992; Robins & Przybeck, 1985; Schuckit & Russell, 1983; Yu & Williford, 1992).

Findings that cannabis use often occurs in the context of a broad range of other so-called 'problem behaviours', including other substance use, precocious sexual activity and problems of personal adjustment suggest that prevention programmes should be broad based rather than focussing on the prevention of only one behaviour (eg, cannabis use). There is a growing body of research indicating that a variety of adolescent problem behaviours tend to co-occur (Angold & Costello, 1993; Caron & Rutter, 1991; Donovan & Jessor, 1985; Donovan et al, 1988; Farrell et al, 1992; Gillmore et al, 1991; Grube & Morgan, 1990; Jessor & Jessor, 1977; Kendall & Clarkin, 1992; McGee & Newcomb, 1992; Osgood et al, 1988; Zoccolillo, 1992). This evidence suggests the need to develop broad based prevention strategies for the avoidance of a range of norm violating behaviours.

Finally, the risk factors associated with the development of substance use suggest that there are four principal routes for intervention and prevention, each of which corresponds to one of the four broad classes of risk factors discussed above.

5.6.1 INTERVENTIONS AIMED AT SOCIAL AND CONTEXTUAL FACTORS.

One important avenue for reducing problems associated with substance use and misuse may be community based interventions. There have been a number of studies that have suggested that the introduction of laws limiting or controlling the supply of tobacco and alcohol reduce the consumption of these products and the occurrence of problems associated with their use. For example, Homel (1994) reported that the introduction of a law in New South Wales lowering the legal blood alcohol concentration from .08 to .05 g% was associated with a small but statistically detectable decline in fatal road accidents. Moreover, the introduction of random breath testing was also associated with a decline in fatal road accidents. Similarly, taxation aimed at increasing the prices of tobacco and alcohol products is associated with a decline in mortality associated with these products (Sloan, Reilly & Schenzler, 1994).

A second community based approach involves attempting to change social norms about the use of tobacco, alcohol and illicit drugs through media campaigns and community health promotion programmes. These programmes have been shown to have some (relatively small) impact on

rates of smoking by decreasing the initiation rate among youth (Perry, Klepp & Schultz, 1988) and increasing rates of smoking cessation among current smokers (Johnson & Solis, 1983). Additionally, Black (1989; cited in Hawkins et al, 1992) reported that a U.S national advertising campaign was successful in encouraging more negative attitudes among youth towards the use of illicit drugs, although the effects of this campaign on actual rates of illicit drug use are unknown.

Finally, it is important to note that while many community initiatives, such as the regulation or elimination of alcohol advertising are, by themselves likely to have only a modest impact on rates of substance use within the community, they may be important to the extent that their implementation will provide an environment and social milieu that is supportive of other intervention strategies (Fergusson, Horwood & Lynskey, 1998; Hawkins et al, 1992). As Hawkins et al (1992, page 88) have commented in regards to drug enforcement efforts aimed at curbing the supply of illicit drugs:

> "In our view, the most powerful effect of interdiction and enforcement activities is to communicate general social norms of disapproval for the distribution and use of illegal drugs."

Much of the work discussed above has explored the role of legal and other sanctions in reducing the use and harm associated with the use of tobacco and alcohol. There has been less research on the effectiveness of these interventions in reducing the use and misuse of cannabis. There has been some Australian research on the effects of the cannabis expiation notice in South Australia on rates of cannabis use in that state. This research has shown that, while there appears to have been an increase in the use of cannabis in South Australia since the introduction of this reform, this increase has been no greater than the increase in cannabis use that has been seen in other states over that time period. Similarly, there have been a number of states in the US that have altered the legal status of cannabis and these changes, which effectively decriminalise the possession of small amounts of cannabis, have not been shown to be associated with increased rates of the use and misuse of cannabis (Donnelly, Hall & Christie, 1995).

Thus, in summary, while the broader research literature on factors associated with adolescent substance use and misuse suggests that general societal attitudes and norms towards the use of drugs may influence levels of drug use, there is little evidence that the current legal status of cannabis in Australia has any detectable impact on the use of this drug.

5.6.2. INTERVENTIONS TARGETED AT HIGH RISK FAMILIES

A second major avenue for implementation of prevention programmes centres on early identification and intervention with high-risk families. These families are characterised by a high number of disadvantageous conditions. Children in such families are at high risk of developing mental health problems, criminal offending and substance use behaviours.

There have been a number of such projects, the results of which have generally been encouraging. Perhaps the most widely known program is the Healthy Start model developed in Hawaii (Hawaii Department of Health, 1992). This program involves the identification of high-risk families at the time of the child's birth on the basis of parental and family characteristics. These families then receive intensive assistance from the caseworker assigned to the family for a period of many years. Formal evaluations of a number of such programmes have now been reported. The programmes have been shown to be effective in improving health care delivery (Johnson, Howell & Molloy, 1993; Olds & Kitzman, 1990), reducing risks of child abuse (Garbarino, 1986; Hawaii Department of Health, 1992; Olds, Henderson, Chamberlain & Tatelbaum, 1986; Rosenberg & Repucci, 1985), decreasing risks of adolescent adjustment problems (Yoshikawa, 1994) and in other areas (Olds & Kitzman, 1990; Price, Cowen, Lorion & Ramos-McKay, 1989; Seitz, Rosenbaum, & Apfel, 1985). While these interventions are not targeted at the prevention of adolescent substance use *per se*, it seems likely that, to the extent that they help improve general family management practices and have been shown to be effective in reducing rates of other adverse outcomes such as delinquency, they may also help to reduce problems of adolescent substance misuse.

5.6.3 SCHOOL BASED INTERVENTIONS TARGETED AT HIGH RISK INDIVIDUALS DURING CHILDHOOD

The third avenue for intervention is to intervene with individuals identified during childhood, on the basis of their behavioural tendencies and school performance, as being at high risk of developing future problems. The principles behind these interventions are broadly similar to those underlying the Healthy Start model described above. However, rather than recruiting families into the program at the time of the child's birth, these programmes target children who have been identified on the basis of their behavioural predispositions during middle childhood. Broadly speaking, two types of interventions have been implemented.

The first involves the provision of extra school based services to children who are educationally "at risk". Perhaps the best known intervention of this type is the Perry Preschool project (Berreuta-Clement, Scweinhart, Barnett, Epstein & Weikhart, 1984). This project involved an extensive intervention with 3 and 4 year olds from disadvantaged backgrounds and included daily participation in a preschool program over a one-to-two year period accompanied by weekly home visits by trained teachers to the child's home. A follow-up was conducted when the sample members were aged 19 years. It showed that, when compared with a control group of children from similar backgrounds, the intervention group had improved school performance and lower arrest records. Although there have been a number of evaluations of similar interventions, the findings of these studies have been inconsistent with some studies reporting beneficial effects and others failing to find such effects (for reviews of this evidence Berrueta-Clement, Schweinhart, Barnett, Epstein & Weikhart, 1985; Consortium for Longitudinal Studies, 1983; Haskins, 1989; Hebbeler, 1985; White, 1985-1986; White, Bush & Castro, 1985-86). Additionally, the precise effects of these programmes on subsequent cannabis use remains

largely unknown. Nonetheless, since poor school performance is a risk factor for the early development of substance use (see Hawkins et al, 1992), programmes that aim to enhance school performance could be expected to also reduce rates of cannabis and other substance use.

5.6.4 SCHOOL BASED INTERVENTIONS TARGETED AT TEACHING LIFE SKILLS AND PEER RESISTANCE SKILLS

There is continued public support for school-based programs that aim to delay or prevent the onset of substance use during adolescence and young adulthood. These programs have been motivated by the widespread use of tobacco, alcohol and illicit drugs, and by the resulting harm. Unfortunately, public enthusiasm for these programs is not matched by evidence of their efficacy. Investigations of the effectiveness of a number of these programs have concluded that many do not influence substance use; in some cases, programs actually seem to increase experimentation with tobacco, alcohol and illicit drugs. However, some more recent studies have established that school based prevention programs can delay or avoid the onset of substance use (Botvin, Baker, Dusenbury, Botvin & Diaz, 1995; Ellickson, Bell & McGuigan, 1993; Ennett et al, 1994). Among the factors which are likely to optimize their effectiveness are: "booster" sessions conducted over a number of years (Botvin et al, 1995; Ellickson et al, 1993; Ennett et al, 1994); an emphasis on social skills training and general life skills rather than on drug knowledge (Botvin et al, 1995; Ellickson et al, 1993; Tobler, 1986); and the active inclusion of peers in running the programs (Tobler, 1986). More recently, a meta-analysis has shown the superiority of programs which are delivered interactively and which focus on interpersonal competence and peer influences (Tobler, 1997).

5.6.5 HARM MINIMISATION

Each of the strategies discussed above is largely targeted at the prevention or delay of the onset of substance use behaviours in adolescence. However, the extent to which this is a realistic or desirable goal is open to debate to the extent that: 1) the available research evidence suggests that at least some level of experimental use of cannabis is normative; 2) The majority of young people who have used cannabis have used the drug only infrequently and at levels which are unlikely to have any long term adverse consequences. The relatively benign nature of much adolescent cannabis use has been highlighted by Robins (1995) who notes that the typical cannabis use "career" involves infrequent use of the drug which peaks in frequency during the late teens and steadily diminishes after that so that by age 30 years most people have virtually ceased cannabis use. She compares this type of career with the typical career for tobacco use, which involves the adoption of smoking during adolescence followed by a life time habit with numerous adverse health consequences.

Given the widespread use of cannabis, a number of recent attempts have been made to reduce the harm associated with cannabis use without necessarily eliminating the use of this drug. These have involved strategies to educate young people to reduce the harm associated with cannabis use. The strategy of harm minimisation has been adopted in a number of other areas, most notably alcohol where attempts to reduce alcohol related harm, and particularly road fatalities, have focussed not on eliminating the use of alcohol but on reducing the incidence of driving while intoxicated. The strategies used to achieve this aim have included tighter enforcement of legal sanctions against driving while intoxicated and education and advertising campaigns aimed at both increasing knowledge of the dangers of driving while intoxicated and creating a social

milieu in which driving while intoxicated is no longer considered acceptable. These efforts have achieved considerable success, as evidenced by a steady decline in both road fatalities and the proportion of road accidents in which alcohol is implicated in recent years (Homel, 1994). Another example of successful harm minimisation in the drug and alcohol field is the widespread introduction of needle and syringe exchange programs (Lurie & Drucker, 1997).

Applications of harm minimisation to reducing cannabis related harm could include all or some of the following: efforts to restrict or limit the use of cannabis in situations which may be physically dangerous such as while driving or using heavy equipment; encouraging the ingestion of cannabis instead of smoking to reduce or eliminate the respiratory effects associated with smoking and educating those most at risk from the negative effects of cannabis use (e.g., women who are pregnant, individuals with a predisposition to psychosis) about the potential harms associated with cannabis use.

There have been relatively few attempts to adopt a harm minimisation approach to the reduction of harm caused by cannabis, probably because of public concerns about being seen to tolerate illicit drug use. The success of such strategies in other areas of drug policy, and particularly in the area of alcohol related harm, clearly suggests that such strategies may reduce cannabis-related harm in Australia.

Finally, while this discussion has presented some broad outlines for components of prevention programmes that may prove effective, it has not presented specific details or proposed a single intervention strategy. This has been deliberate since there is unlikely to be any single prevention strategy that will be wholly effective in reducing drug use. Programmes that aim to prevent substance use problems should accordingly be as broad based as possible. The various prevention strategies discussed above are each likely to play a role in the effective prevention of substance use problems and it is probable that the effectiveness of each of these strategies will be enhanced by the effective implementation of other strategies. For example, community based strategies that eliminate alcohol and tobacco advertising will help to create a social milieu in which strategies that identify and intervene with high risk families and individuals are likely to be more effective. Thus, in summary, an important approach in the prevention area is not to debate which single strategy will be most effective but to consider the optimal combination of a wide range of prevention strategies which span community intervention, identification of and intervention with high risk families and individuals, and school based life skills programmes which help to reduce the potentially harmful effects of peer influence on drug use.

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Authors	Sample Description	Outcome studied	Age	Prevalence of cannabis use	
				Males	Females
Donnelly et al (1990)	3753 NSW school students	Ever used cannabis	12 years 13 years 14 years 15 years 16 years 17 years 12-17 Years	8% 15% 33% 36% 40% 45% 27.7%	3% 7% 14% 21% 25% 23% 14.8%
Blaze-Temple & Lo (1992)	Household survey of 1093 13-17 year old Perth residents	Ever Used Cannabis	13-17 years	38%	32%
			13 years 14 years 15 years 16 years 17 years	9% 24% 36% 50% 48%	
Christie et al (1989)	Survey of South Australian school children in years 7-11 – data collected in 1987	Ever Used Cannabis	11 years 12 years 13 years 14 years 15 years 16 years 11-16 years	3.8% 6.7% 12.0% 25.9% 38.8% 45.3% 22.9%	1.0% 2.8% 7.6% 27.5% 33.2% 31.5% 18.3%
Christie et al (1990)	Survey of South Australian school children in years 7 – 11 - data collected in 1988	Ever Used Cannabis	11 years 12 years 13 years 14 years 15 years 16 years 11-16 years	6.1% 7.2% 14.5% 24.7% 36.4% 45.7% 22.5%	3.1% 3.9% 4.7% 17.1% 28.9% 37.7% 15.9%
Cooney, Dobbinson & Flaherty (1994)	1992 Survey of New South Wales school students	Ever used cannabis	12 years 13 years 14 years 15 years 16 years 17 years 12-17 Years	10% 18% 31% 39% 47% 40% 29.8%	7% 10% 21% 27% 38% 33% 20.9%
McAllister & Makkai (1991)	Surveys of general population conducted in 1985 and 1988	Ever Use of Cannabis	1985: 14-15 years 1985:16-17 years 1985:18-19 years 1985:14-19 years 1988:14-15 years 1988:16-17 years	15% 42% 51% 35.4% 9% 32%	11% 29% 40% 25.7% 11% 34%

			1988:18-19 years	49%	42%
			1988:14-19 years	30.7%	27.8%
Roy Morgan (1993)[4]	1992 survey of alcohol, tobacco and other drug use among Victorian secondary school students	Ever Used Cannabis	Year 7	6.9%	4.1%
			Year 8	14.3%	12.3%
			Year 9	23.3%	19.1%
			Year 10	36.8%	27.0%
			Year 11	47.8%	37.0%
			Years 7-11	25.8%	20.5%

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[4] Due to the manner in which the data in the Roy Morgan (1993) report was presented, it was not possible to either present the data by age.

APPENDIX 2: POOLED ESTIMATES OF THE PREVALENCE OF LIFETIME CANNABIS USE BY AGE AND GENDER

Age (Years)	Males	Females	Persons
12	7.9	4.2	6.0
13	15.2	7.5	11.3
14	28.9	19.2	24.0
15	37.7	26.4	31.7
16	44.6	31.9	37.9
17	42.3	27.6	34.6
12-17	26.6	17.0	21.6

APPENDIX 3: WEIGHTED ESTIMATES OF PREVALENCE (%) OF LIFETIME CANNABIS USE AMONG MALES AND FEMALES BY AGE (SAMPLE SIZES ARE SHOWN IN BRACKETS).

AGE	Males	Females	Total
12 Years	16.8 (1862)	10.1 (2044)	13.5 (3906)
13 Years	25.4 (2680)	18.2 (2826)	21.9 (5506)
14 Years	37.8 (2695)	31.0 (2917)	34.5 (5612)
15 Years	48.4 (2725)	41.2 (2905)	44.9 (5630)
16 Years	53.2 (2485)	46.3 (2626)	49.7 (5111)
17 Years	56.6 (1831)	54.2 (1851)	55.4 (3682)
12-17 Years	39.8 (14278)	33.3 (15169)	36.4 (29447)