Epidemiology Occasional Paper 19
ISSN 1329-7252

The impact of alcohol on the health of Western Australians

January 2004

Collaborative report between
the Drug and Alcohol Office
and Department of Health

Citation

Unwin E, Codde JP, Bartu A (2004). *The impact of alcohol on the health of Western Australians*. Epidemiology Occasional Paper 19, ISSN: 1329-7252. Drug and Alcohol Office and the Epidemiology Branch, Health Information Centre, Department of Health, Perth, Western Australia.

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1. Introduction

While recent media and political attention on illicit drugs may have slightly diminished the relative importance of alcohol as a drug of concern, alcohol is one of the most commonly used drugs in Australia, with 80% of the Australian population over the age of 13 drinking either regularly (48.6%) or occasionally (31.9%) (Miller & Draper, 2001).

In moderation, alcohol can have positive effects on health, and it has been well documented that low levels of drinking can reduce the risk of heart disease (Doll, 1998; Mukamal et al., 2003). However, many conditions are adversely affected by alcohol, especially at high levels of consumption. While moderate alcohol use may be beneficial from middle age, excessive alcohol use is harmful at any age (Mathers et al., 1999).

In 2000, over 27% of Western Australian adults reported drinking over the amounts recommended by the National Health and Medical Research Council (NHMRC) (NHMRC, 1987; Daly et al., 2001[b]). In addition, the 1998 National Drug Strategy Household Survey found that overall the 20 to 29 years age group had the highest proportion of hazardous or harmful drinkers (8% nationally) with Western Australia (WA) recording the highest (14%) (Miller & Draper, 2001).

There is a strong consensus among social scientists, based on compelling evidence, that as alcohol consumption increases in any country so do a range of serious social, health and legal consequences (Crosbie et al., 2000). Between 41% and 70% of violent crimes in Australia are committed while under the influence of alcohol (Commonwealth Department of Health and Aged Care, 2001), and alcohol is involved in about half the cases of domestic and sexual violence (NHMRC, 2001).

People are more likely to suffer injury or other harms as a consequence of excessive drinking than they are as a consequence of illicit drug taking (Crosbie et al., 2000). A study conducted by the National Drug Strategy in 2001 found that twice as many Australians aged 14 years and over had experienced alcohol-related anti-social behaviour in the last year (30.6%) compared to those who experienced illicit drug-related anti-social behaviour (15.1%) (AIHW, 2002).

The social cost of alcohol misuse in Australia (which includes crime, health care, loss of productivity, road accidents, fire injuries, death and pain and suffering), was estimated at more than A$7.5 billion for the financial year 1998/99 (Collins & Lapsley, 2002).

Alcohol misuse has a significant impact on health and reducing alcohol harm is a public health priority. This report draws information from a wide range of sources including per capita levels of alcohol consumption, prevalence surveys, alcohol-caused deaths and hospitalisations (including emergency department data), admissions to sobering up centres, Next Step Specialist Drug and Alcohol Service treatment data, data from non-government alcohol and drug services, and calls to the Alcohol and Drug Information Service relating to alcohol. In doing so, it presents a broad picture of the impact of alcohol on the health of West Australians.

2. Alcohol consumption in Western Australia

It is important to monitor alcohol consumption in the population to estimate the risk of alcohol-related harm. There are two ways in which this is traditionally done – by population surveys or by using surrogate measures. Information obtained using both methods is presented here.

2.1 Liquor licensing data

One of the most reliable surrogate measures is per capita alcohol consumption. This is derived from wholesale sales data[1] obtained annually from the Liquor Licensing Division of the Western Australian Office of Racing, Gaming and Liquor. For further information see Daly et al., 2001[a].

What is the most popular type of alcoholic beverage in Western Australia?

In 1998/99, beer accounted for 54.8% of all alcoholic beverages consumed (regular 38.7%; low alcohol 16.1%). Wine accounted for 29.3% and spirits for 15.9% (Table 1).

Table 1: Apparent per capita alcohol consumption (litres of absolute alcohol per person 15 years and over) and proportion by beverage type, WA, 1998/99

	Beer			Wine	Spirits			All
	Regular	*Low alcohol*	Total		*Regular*	*Pre-mixed*	Total	Alcohol
Litres	*4.01*	*1.67*	5.68	3.04	*1.25*	*0.4*	1.65	10.37
%	*38.7*	*16.1*	54.8	29.3	*12.0*	*3.9*	15.9	100.0

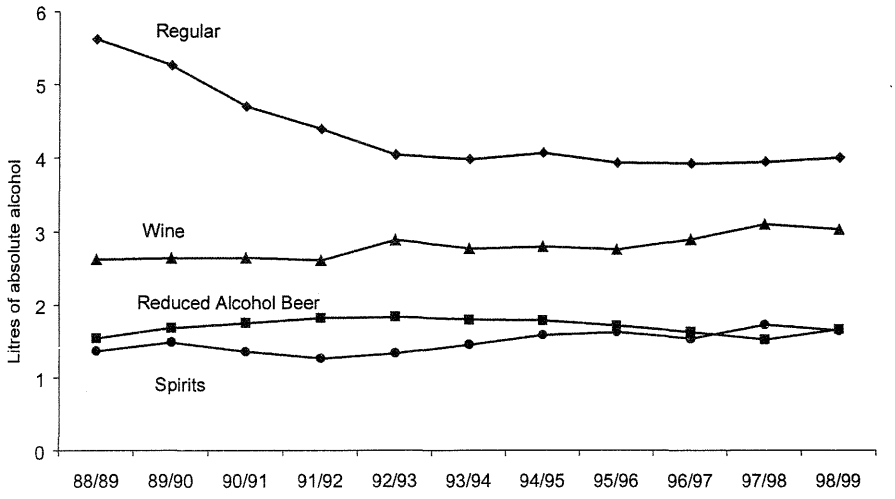
What is the trend in alcohol consumption in Western Australia?

Total beer consumption significantly declined by 20.8% between 1988/89 and 1998/99, due to a significant reduction of 28.6% in the consumption of regular strength beer between 1988/89 and 1992/93. Since then, consumption of regular strength beer has remained steady at about four litres of absolute alcohol per capita.

Reduced strength beer showed a significant increase in consumption of 8.0% between 1988/89 and 1998/99, peaking in 1992/93 at 1.84 litres of absolute alcohol. Although there were also increases in per capita consumption of wine and spirits over the same period, these were not statistically significant (Figure 1).

[1] Although retail sales data would provide a more direct estimate, they cannot be used as the data are contaminated by the inclusion of all liquor outlet sales, for example, cigarette and soft drink sales. However, a validation study comparing retail sales data and wholesale sales data reported a correlation of 0.79, making wholesale sales a reasonable proxy for retail sales (Phillips et al., 1994).

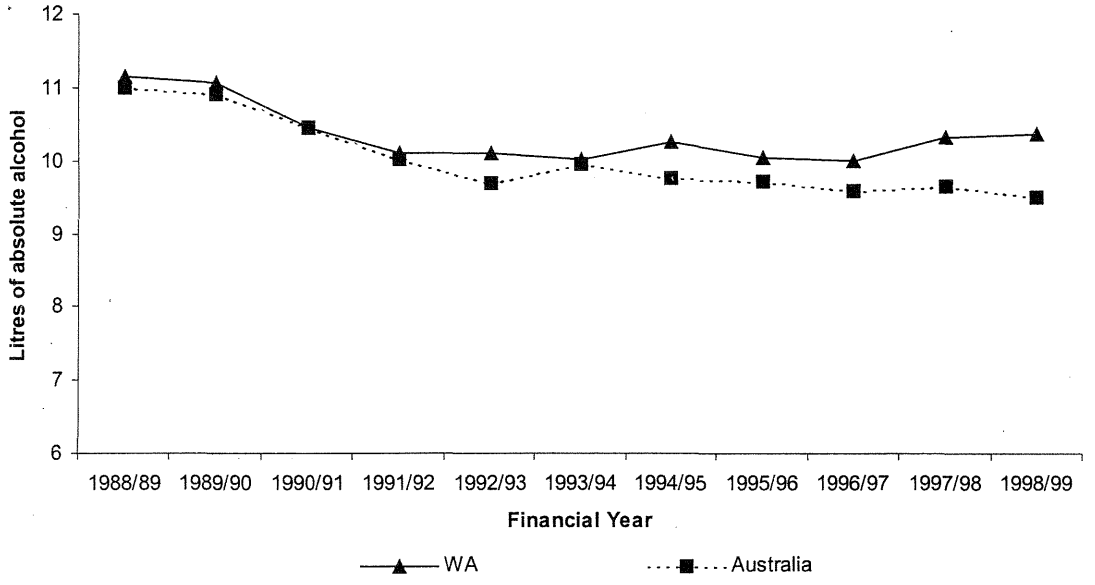
Figure 1: Per capita consumption of alcohol, WA, 1988/89 to 1998/99



How does the trend in alcohol consumption in Western Australia compare to Australia?

Total alcohol consumption significantly declined in both WA and Australia over the eleven-year study period, by 7.1% and 13.8% respectively. Between 1991/92 and 1996/97, per capita consumption in WA remained fairly steady at just over ten litres of absolute alcohol per adult per year, before increasing by 3.7% between then and 1998/99. Nationally per capita consumption has continued to decrease (Figure 2).

Figure 2: Per capita consumption of alcohol, WA & Australia, 1988/89 to 1998/99



2.2 Prevalence data

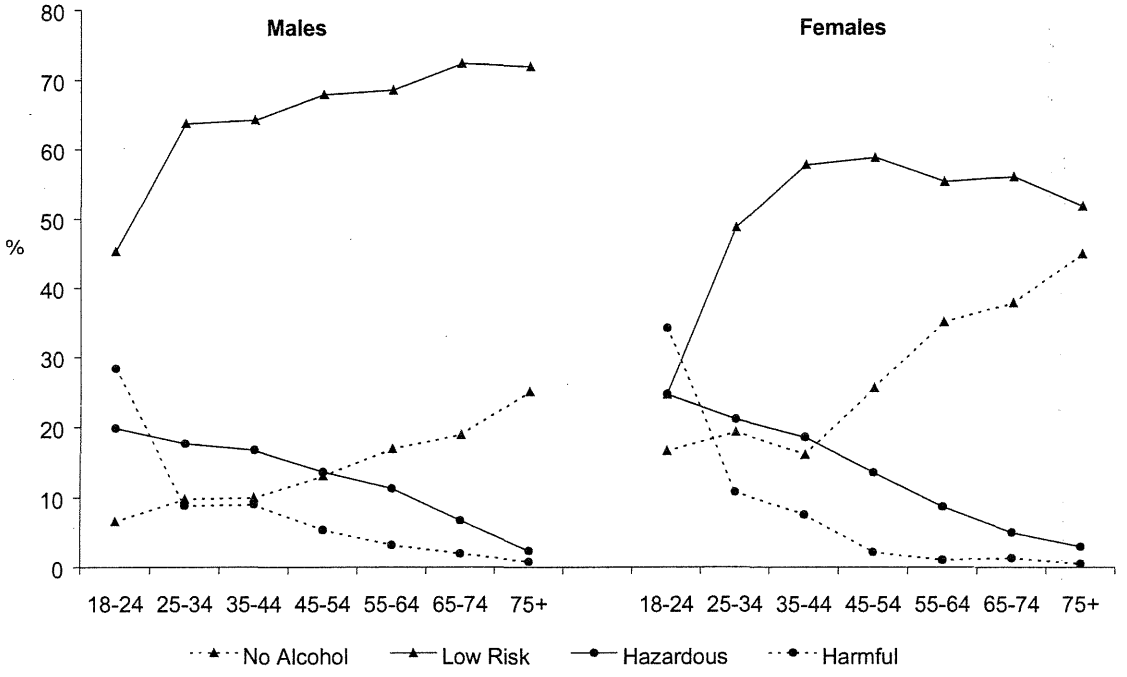
Population surveys have the benefit of being able to associate demographic characteristics with alcohol consumption levels. However, estimates of alcohol consumption given in surveys have been found to be under-reported when compared with alcohol sales (Midanik, 1982).

What are the drinking patterns of Western Australians by age and sex?

In late 2000, over 10,000 Western Australian adults (18 years and over) participated in the comprehensive WA Health and Wellbeing Survey (Daly et al., 2000[b])[2]. The findings showed that 23.7% of males and 28.0% of females drink outside the NHMRC guidelines[3] (NHMRC, 1987).

Abstinence increased with age, and was higher for women, especially after the age of 44 years. For males of all ages and females aged 25 years and older, low risk drinking was the most common drinking pattern. Low risk drinking increased with age for men, but decreased for females after the age of 45 years, coinciding with the increase in the prevalence of abstinence (Figure 3).

Figure 3: Prevalence of alcohol intake, by age and sex, WA, 2000



Source: 2000 Collaborative Health and Wellbeing Survey, Health Department of WA

Harmful and hazardous drinking were highest in 18 to 24 year olds of both sexes and decreased with age, with harmful drinking showing a steep decline in 25 to 34 year olds. The proportion of females drinking at harmful levels was higher than that for

[2] Details about the design and methodology of the 2000 Health and Wellbeing Survey are available on: http://www.health.wa.gov.au/Publications/CWHS/index.html.

[3] The alcohol component of the health survey data was analysed according to the recommended guidelines published in the 1987 NHMRC report. These guidelines have since been revised (NHMRC, 2001). A comparison of the old and new drinking guidelines is shown in the Appendix.

males until the age of 34 years, and the proportion of hazardous drinkers was higher for females until the age of 44 years (Figure 3).

How many young people in Western Australia consume alcohol?

A 1999 survey of alcohol consumption among 12 to 17-year old school students in WA found that 90% of all students surveyed had experimented with alcohol at some time in their life. Seventy-four percent had drunk alcohol in the last year, 51% in the last month, and 36% in the week prior to the survey (Drug and Alcohol Office, Population Health Division, Department of Health, WA and the Centre for Behavioural Research in Cancer, Anti-Cancer Council of Victoria, 2002).

What is known about the drinking patterns of Aboriginal people?

There are limited data about the extent and nature of Aboriginal drinking and, for the data that are available, methodological inconsistencies and differences in the locations and types of communities lead to difficulties in interpreting the results (Alexander 1990). Despite these problems, there is evidence of the hazardous use of alcohol among Aboriginal people.

A number of reports (Unwin et al., 1994; Perkins et al., 1994; Department of Health and Family Services 1995; ABS, 1995; McLennan & Madden, 1999; Saggers & Gray, 1998; Alcohol and Other Drugs Council of Australia, 2000) have highlighted some important points about alcohol consumption among Aboriginal people:

- higher proportions of Aboriginals than non-Aboriginals, particularly females, do not drink alcohol
- a lower proportion of Aboriginals than non-Aboriginals are regular drinkers (i.e. drink at least once a week)
- higher proportions of Aboriginals than non-Aboriginals who consume alcohol do so at levels considered hazardous or harmful to health
- the proportion of Aboriginal drinkers is highest in the younger age groups
- most young Aboriginal males drink alcohol
- the frequency of alcohol consumption among Aboriginal people is related to where they live, and depends on the availability of alcohol and financial resources
- about a sixth of Aboriginal drinkers give up alcohol, generally in their forties.

3. Mortality and morbidity data

The use of aetiologic fractions enables the number of alcohol-caused deaths or episodes of hospitalisation (caused or prevented) to be estimated. They are calculated by multiplying the number of sex- and age-specific cases for each alcohol-related condition[4] by the corresponding aetiologic fraction.[5]

A comprehensive set of aetiologic fractions for Australia was first developed by Holman et al. in 1990. These fractions used abstinence as the reference exposure category, and therefore measured both the risks and the benefits of alcohol consumption.

The aetiologic fractions were revised by English et al. in 1995 using low levels of drinking[6] as the reference exposure category. They postulated that an aetiologic fraction for alcohol-caused morbidity and mortality should ideally pertain to 'unsafe' alcohol consumption and should estimate the proportion of deaths and hospital admissions that would be prevented if all 'unsafe' drinkers were to reduce their exposure to a reasonable level (English et al., 1995).

When the Australian Institute of Health and Welfare (AIHW) updated the aetiologic fractions in 2001 (Ridolfo and Stevenson, 2001) they reverted to using abstinence as the reference exposure category to estimate the total effect of alcohol consumption. As alcohol consumption at low levels can have a protective effect against developing some medical conditions, some of the aetiologic fractions have a negative value.[7]

The aetiologic fractions used in this report are those proposed by the AIHW. However, minor changes to the coding used to define some of the conditions were necessary in order to accurately map conditions which had been coded using the ninth International Classification of Diseases (ICD-9) to ICD-10 codes. The revised ICD-9 and ICD-10 codes for alcohol-related conditions were agreed by a working party from the Department of Health, WA and the National Drug Research Institute (Chikritzhs et al., 2002).

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[4] Alcohol-related conditions are shown in Table 2.

[5] Some conditions are wholly attributable to the use of alcohol (e.g. alcoholic liver cirrhosis). For such conditions the aetiologic fractions are 1.0. However, most conditions cannot be attributed wholly to the use of alcohol. In these cases, an indirect estimate of alcohol-caused cases is obtained by applying the aetiologic fraction (which is less than 1.0) to the number of cases from a particular condition.

[6] A low level of drinking is defined as a level of alcohol intake that is considered neither hazardous or harmful according to NHMRC (1997) criteria (see Appendix), but does not include abstinence from alcohol.

[7] The conditions which have negative fractions are: supraventricular cardiac dysrthythmias, cholelithiasis, ischaemic heart disease, and heart failure for both sexes; and hypertension and stroke for females only.

4. Deaths

Records for deaths which occurred between 1983 and 2001[8] and were due to conditions known to be related to alcohol were extracted from the mortality database. This database is based on notifications of deaths to the Registrar General's office and maintained by the Health Information Centre at the Department of Health, WA.

Until 1997, only the underlying cause of death was recorded but after this time multiple causes of death were available on the death records.

How many deaths and lives saved are alcohol-related conditions responsible for?

Alcohol can have harmful effects, evident in acute and chronic conditions, and protective effects, which are only evident in chronic conditions.

In WA between 1983 and 2001, alcohol was responsible for a total of 7,909 deaths, but 9,667 deaths were prevented by alcohol use (Table 2). This gives a net saving of 1,758 lives over the 19-year period, or an average of 92 lives saved per year.

[8] Death data from 1997 are coded to ICD-10. This is a different coding system to ICD-9, which was used previously, and therefore makes time trend analyses spanning the two coding systems difficult.

Table 2: Number of alcohol-caused deaths or lives saved, by sex and condition, WA, 1983-2001

	Males	Females	#Persons
Alcohol harm (acute)			
*Alcoholic poisoning	20	5	25
*Aspiration	91	56	147
Fall injuries	80	29	109
Fire injuries	37	22	59
Drowning	106	22	128
Occupational & machine injuries	8	0	9
Suicide	1,036	215	1,251
Assault	120	92	212
Child abuse	6	6	11
Road injuries - pedestrian	39	5	44
Road injuries - vehicle	1,044	163	1,207
Total acute harm	*2,587*	*616*	*3,203*
Alcohol harm (chronic)			
*Alcoholic psychosis	63	18	81
*Alcohol dependence	227	57	284
*Alcohol abuse	32	16	48
*Alcoholic poly neuropathy	1	0	1
*Alcoholic cardiomyopathy	168	20	188
*Alcoholic gastritis	2	1	3
*Alcoholic liver cirrhosis	881	298	1,179
*Alcohol induced chronic pancreatitis	20	10	30
Oropharyngeal cancer	254	63	317
Oesophageal cancer	368	137	506
Liver cancer	192	71	264
Laryngeal cancer	154	19	173
Female breast cancer	0	409	409
Epilepsy	31	19	51
Hypertension	50	0	50
Supraventricular cardiac dysrthythmias	0	0	0
Oesophageal varices	5	2	8
Gastro-oesophageal haemorrhage	3	3	6
Acute pancreatitis	29	24	53
Ischaemic heart disease	0	80	80
Heart failure	0	0	0
Psoriasis	1	0	1
Stroke	928	47	976
Total chronic harm	*3,411*	*1,296*	*4,706*
Total harm	*5,998*	*1,911*	*7,909*
Alcohol benefit (chronic)			
~Hypertension	0	-45	-45
~Stroke	-4	-2,733	-2,737
Supraventricular cardiac dysrthythmias	-44	-53	-97
Cholelithiasis	-12	-14	-26
Ischaemic heart disease	-4,114	-2,172	-6,286
Heart failure	-229	-247	-477
Total alcohol benefit	*-4,403*	*-5,264*	*-9,667*
Grand Total	***1,595***	***-3,353***	***-1,758***

~ alcohol only has a protective effect for these conditions in women.
** these conditions are wholly attributable to alcohol*
.# The use of aetiologic fractions sometimes results in fractions of cases. Thus the number of persons may not equal the sum of males and females because numbers are rounded for presentation.

What were the top five alcohol-related conditions responsible for deaths?

Five conditions were responsible for 65% of alcohol-caused deaths[9] over the period 1983 to 2001. These were:

1. suicide (15.8%)
2. vehicular road injuries (15.3%)
3. alcoholic liver cirrhosis (14.9%)
4. stroke (12.3%)
5. oesophageal cancer (6.4%).

The top five conditions varied slightly for males and females. The top five conditions for **males**, responsible for 71% of alcohol-caused male deaths over the period 1983 to 2001, were:

1. vehicular road injuries (17.4%)
2. suicide (17.3%)
3. stroke (15.5%)
4. alcoholic liver cirrhosis (14.7%)
5. oesophageal cancer (6.1%).

The top five conditions for **females**, responsible for 64% of alcohol-caused female deaths over the period 1983 to 2001, were:

1. breast cancer (21.4%)
2. alcoholic liver cirrhosis (15.6%)
3. suicide (11.3%)
4. vehicular road injuries (8.5%)
5. oesophageal cancer (7.2%).

[9] To calculate the percentages of deaths, conditions for which alcohol had a protective effect were excluded.

What is the impact of alcohol on deaths by sex and race?

The impact of the effects of alcohol on mortality varied with sex and race, with the net benefits of alcohol use being confined to non-Aboriginal females (Figure 4; Table 3). Aboriginals, who make up 3% of the population, accounted for 2% of the lives saved.

Figure 4: The impact of alcohol on deaths, WA, 1983-2001

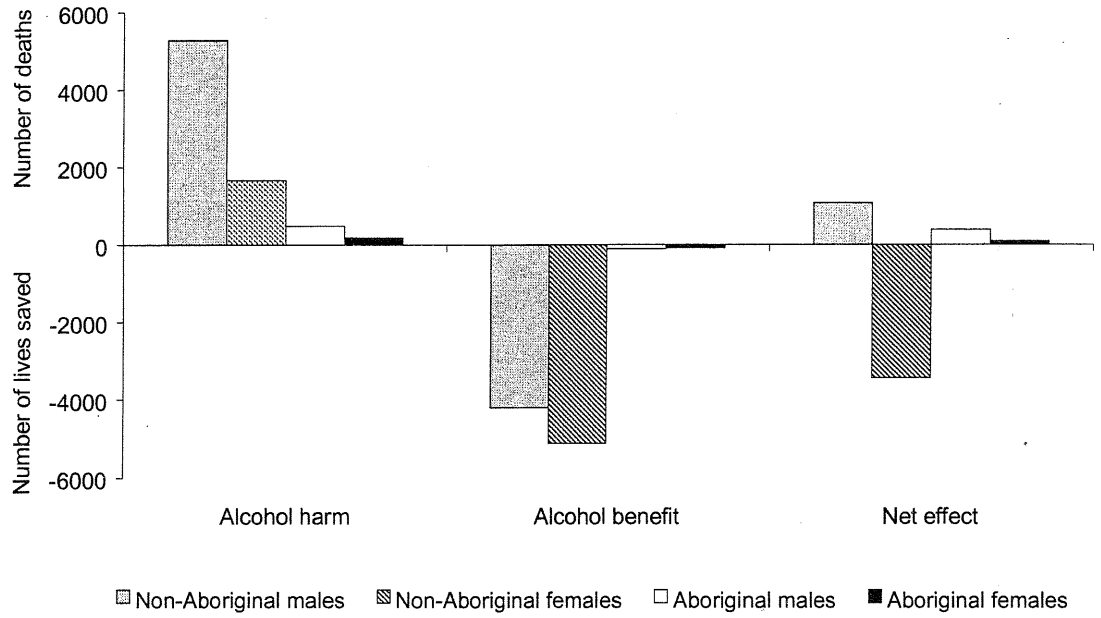


Table 3: Estimated number of lives lost and saved from alcohol use, by race and sex, WA, 1983-2001

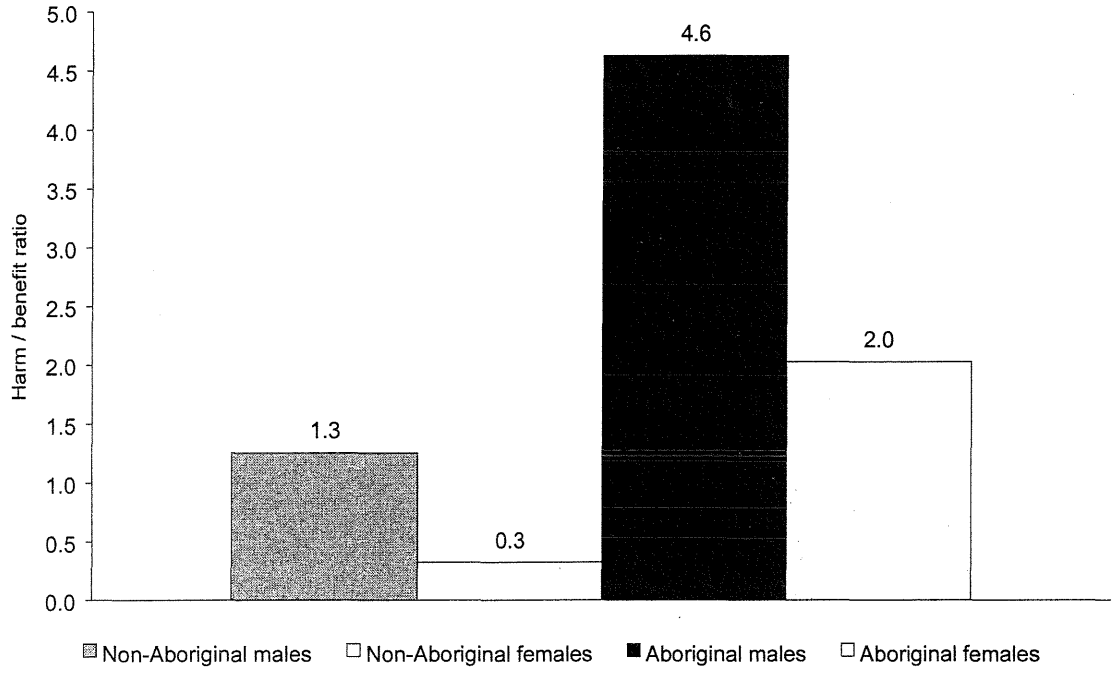
	Non-Aboriginal		Aboriginal		*Persons		
	Male	Female	Male	Female	Male	Female	Total
Lives lost	5,279	1,665	488	181	5,998	1,911	7,909
Lives saved	-4,203	-5,106	-105	-90	-4,403	-5,264	-9,667
Net effect	1,076	-3,442	382	92	1,595	-3,353	-1,758

** This includes cases where Aboriginality was missing, so the sum of the non-Aboriginal and Aboriginal cases does not add up to the total number of persons.*

A harm to benefit ratio was calculated by dividing the number of alcohol-caused deaths by the number of lives saved by alcohol. The harm to benefit ratio was much higher for Aboriginals than for non-Aboriginals.

For Aboriginal males the ratio was 4.6 (488 deaths / 105 lives saved), more than three times higher than the ratio for non-Aboriginal males (1.3). Among females, the Aboriginal ratio of 2.0 was more than six times higher than the non-Aboriginal ratio of 0.3 (Figure 5).

Figure 5: The harm to benefit ratio for alcohol-caused deaths by race and sex, WA, 1983-2001



How many person years of life are lost or saved because of alcohol use?

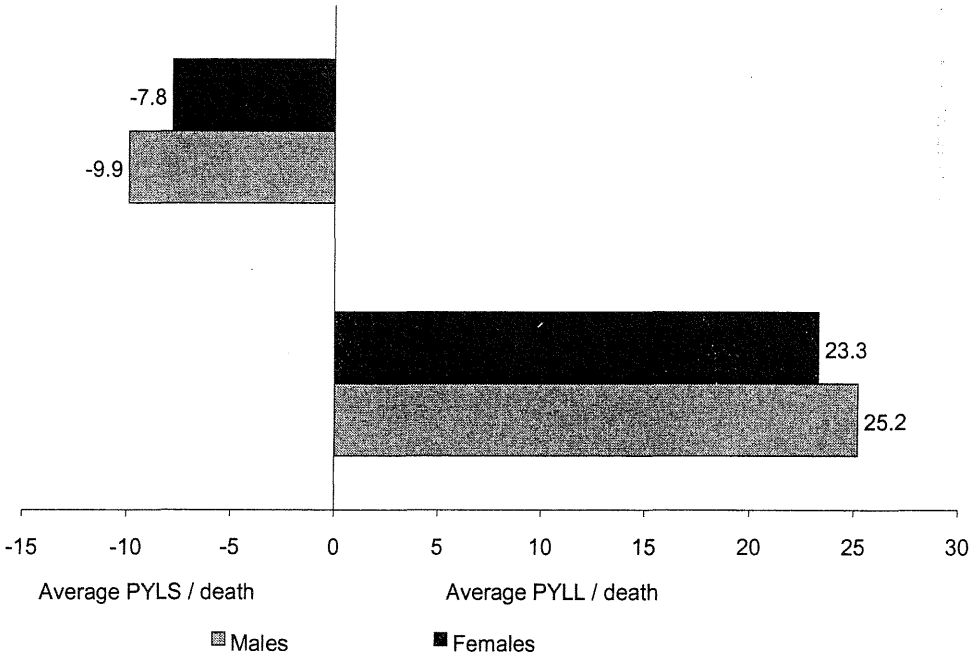
Whilst alcohol had an overall net protective effect on the number of deaths, examination of the number of person years of life lost (PYLL) or saved (PYLS), which takes the age of death into account, showed a different picture.

The PYLL formula used here calculates the number of years of life lost or saved up to the age of 74 years. As the conditions on which alcohol has a preventative effect are chronic conditions, mainly affecting older people, and about a third of the conditions on which alcohol has a harmful effect are acute conditions, which mainly impact on younger people, less years of life are saved by alcohol than are lost.

Overall, males lost over five times as many years of life than they gained through alcohol use, and females lost over four times as many years of life than they gained.

Males lost an average of 25.2 years per death and gained an average of 9.9 years per life saved, while females lost an average of 23.3 years and gained 7.8 years (Figure 6). This equates to a net loss of approximately 15 years per death for both sexes.

Figure 6: Average number of person years of life saved or lost by sex, WA, 1983-2001



How do the person years of life lost or saved through alcohol use differ by race?

Aboriginal females lost a similar number of net PYLL per death as non-Aboriginal males and females, and Aboriginal males lost less years per death.

However, when the average PYLL per 1,000 population was examined a different picture emerged because of the smaller Aboriginal population. The net average number of PYLL per 1,000 population for Aboriginal people was nearly four times higher for males and five times higher for females compared to non-Aboriginal males and females (Table 4).

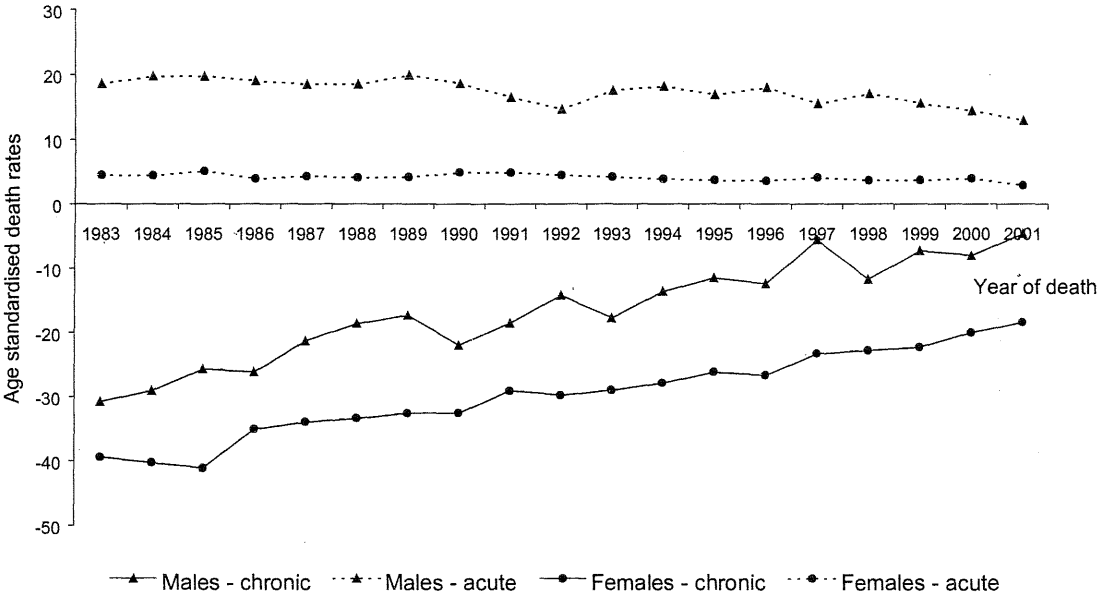
Table 4: Person years of life lost (PYLL) or saved (PYLS) from alcohol, by sex and race, WA, 1983-2001

HARM	*Number of deaths (0-74 years)*	*Number of PYLL*	*Average PYLL / death*	*Average PYLL / 1,000 popn*
Non-Aboriginals				
Males	4,223	101,980	24.1	6.9
Females	1,227	26,855	21.9	1.9
Aboriginals				
Males	464	11,797	25.4	23.6
Females	173	4,620	26.7	9.2
BENEFIT	*Number of deaths averted (0-74 years)*	*Number of PYLS*	*Average PYLS / life saved*	*Average PYLS / 1,000 popn*
Non-Aboriginals				
Males	2,022	19,039	9.4	1.3
Females	851	6,192	7.3	0.4
Aboriginals				
Males	86	1,258	14.6	2.5
Females	56	689	12.3	1.4
NET EFFECT	*Net number of lives lost*	*Net number of PYLL*	*Net ave PYLL / death*	*Net ave PYLL / 1,000 popn*
Non-Aboriginals				
Males	2,201	82,941	14.7	5.6
Females	376	20,664	14.6	1.5
Aboriginals				
Males	378	10,539	10.8	21.1
Females	117	3,931	14.4	7.8

What has the trend in alcohol-caused deaths been for chronic and acute conditions?

There were significant changes in age-standardised death rates (ASRs)[10] for both chronic and acute conditions over the 19-year period. ASRs for chronic conditions increased significantly, i.e. less lives were saved, for both males (t-score=13.7; p=0.001) and females (t-score=22.0; p=0.000), while ASRs for acute conditions showed significant decreases, i.e. there were less deaths, for both males (t-score=-5.4; p=0.012) and females (t-score=-3.7; p=0.033) (Figure 7).

Figure 7: Age-standardised rates for alcohol-caused deaths and lives saved, by type of condition and year of death, WA, 1983-2001



[10] The statistical methods used are detailed in the Glossary.

What is the age pattern of deaths (or lives saved) due to chronic and acute alcohol-caused conditions?

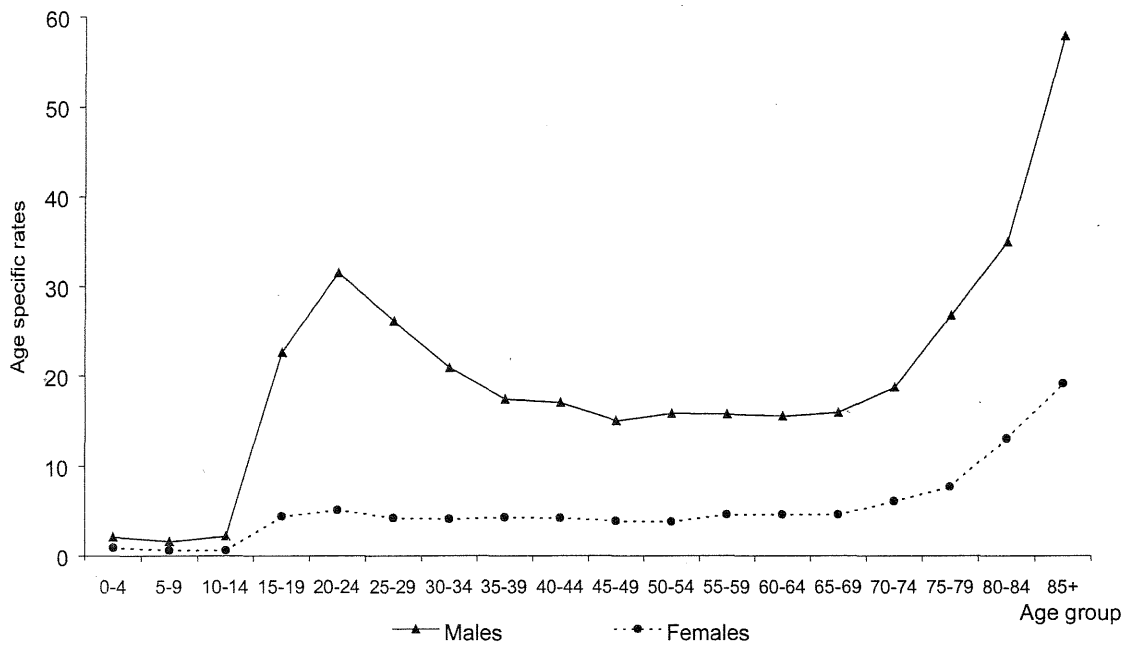
Acute

For acute alcohol-caused conditions, male age-specific death rates were higher than those for females in all age groups, especially between the ages of 15 and 34 years (Figure 8).

Male death rates rose steeply in the 15 to 19 years age group and peaked in the 20 to 24 years age group. After that male rates declined, plateauing at around 15 deaths per 100,000 population between 45 and 69 years, before rising again.

Female death rates due to acute alcohol-caused conditions showed a small increase in the 15 to 19 years age group, then remained relatively steady until the age of 70 when they began to increase slightly.

Figure 8: Age-specific death rates for acute alcohol-caused conditions, by sex, WA, 1983-2001



Chronic

For deaths due to chronic alcohol-caused conditions, the protective effect of alcohol did not take effect until the age of 65 years for both sexes (Figure 9; Table 5).

Figure 9: Age-specific death rates for chronic alcohol-caused conditions, by sex, WA, 1983-2001

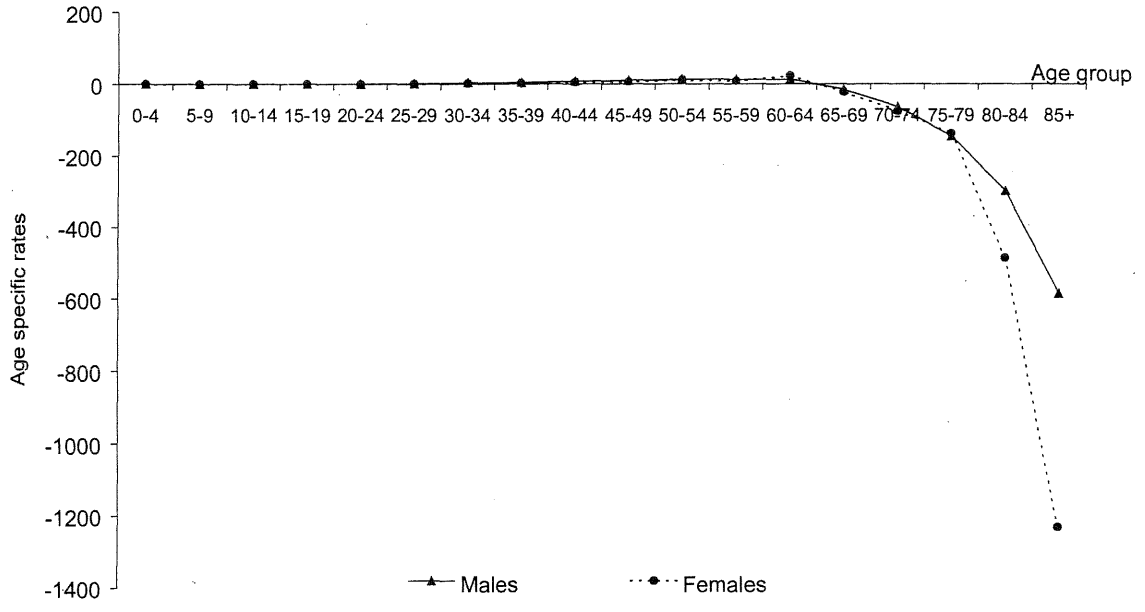


Table 5: Estimated number of alcohol-caused deaths and lives saved by age group and sex, WA, 2001

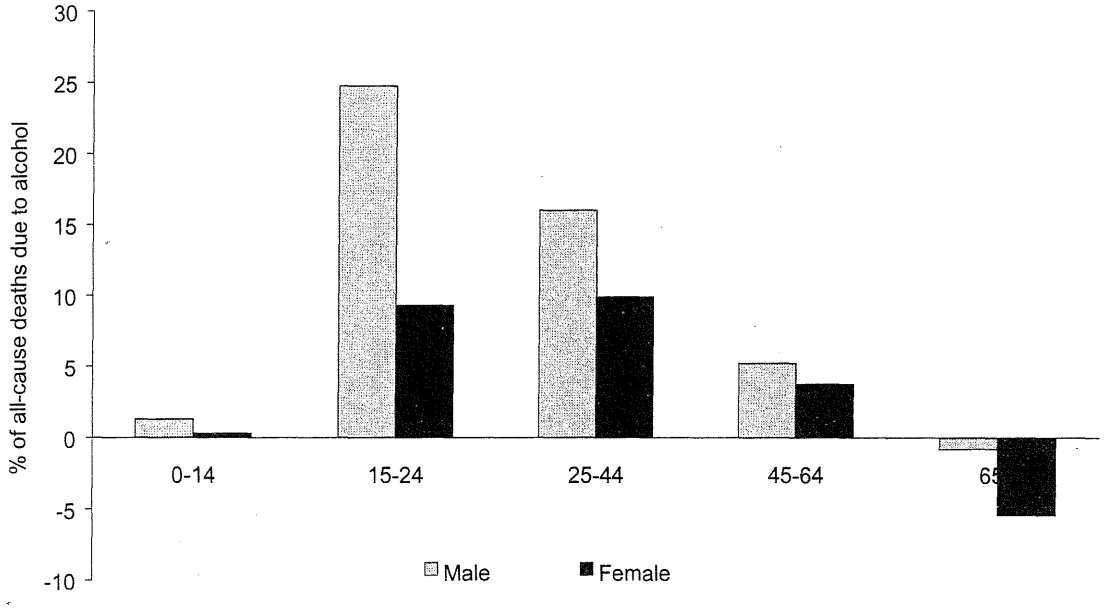
	0-14 yrs	15-24 yrs	25-44 yrs	45-64 yrs	65+ yrs
Male	1	31	60	51	-31
Female	0	4	20	21	-219
Persons	1	35	80	71	-251

What proportion of all deaths is due to alcohol by age group?

An estimated 25% of all deaths among males aged 15 to 24 years, and 16% of deaths among males aged 25 to 44 years were due to alcohol, whereas only about 10% of all female deaths between 15 and 44 years were alcohol-caused.

In older people (65 years and above), 0.8% of male deaths and 5.4% of female deaths were saved through alcohol use (Figure 10).

Figure 10: Alcohol-caused deaths as a percentage of all deaths, by age group, WA, 2001

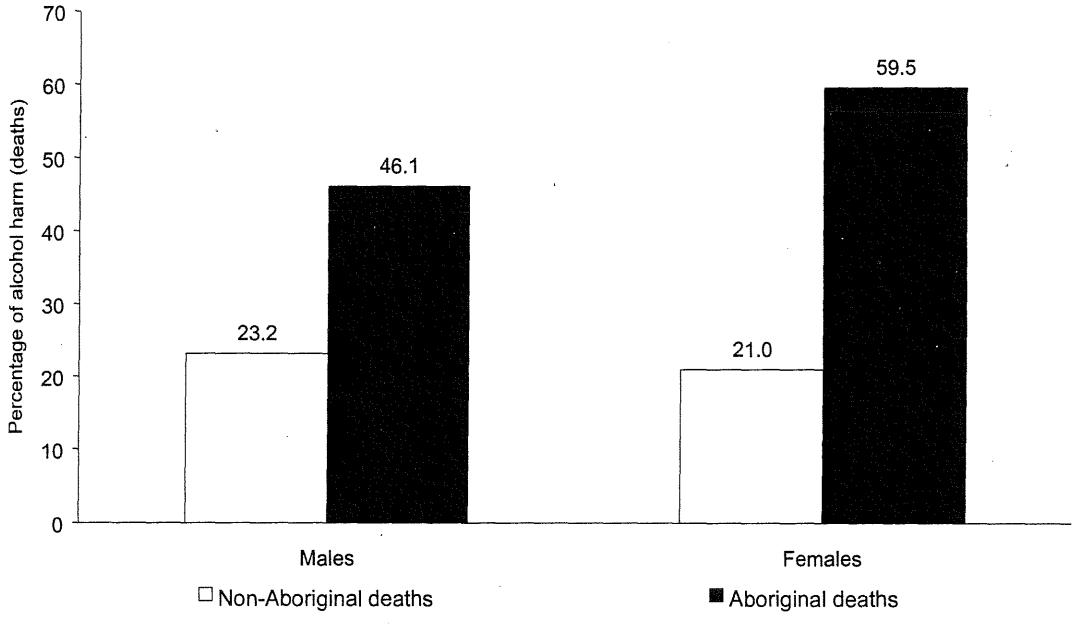


What proportion of deaths are wholly attributable to alcohol?

Over the period 1983 to 2001, about a quarter of deaths from the harmful effects of alcohol (i.e. not including those conditions for which alcohol had a protective effect) were wholly attributable to alcohol[11].

There were marked differences in the proportion of alcohol-caused deaths that were wholly attributable by sex and race. For non-Aboriginal males 23.2% of alcohol deaths were due to wholly attributable conditions, whereas for Aboriginal males the proportion was double (46.1%). Racial differences were even more pronounced for females: 21.0% of alcohol deaths among non-Aboriginal females were due to wholly attributable conditions, whereas the proportion was 59.5% for Aboriginal females (Figure 11).

Figure 11: Percentage of alcohol deaths that are wholly attributable to alcohol, by race and sex, WA, 1983-2001



[11] Conditions wholly attributable to alcohol are identified in Table 2. The concept of wholly attributable conditions is explained in the Mortality and Morbidity Data section.

5. Burden of disease

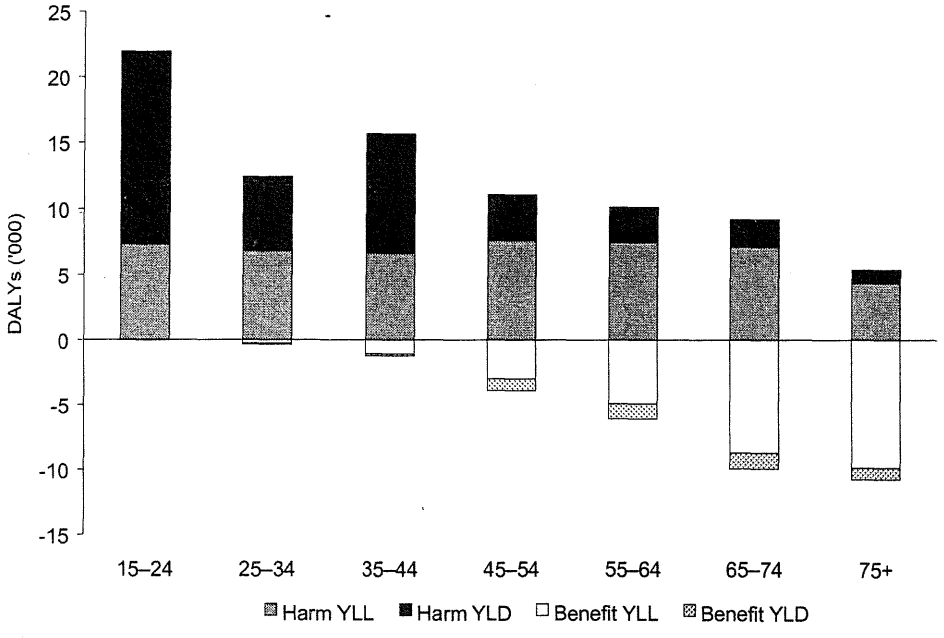
The burden of disease (BOD) describes the impact of different diseases and risk factors on the quantity and quality of life in a population. The disability adjusted life year (DALY) is the measure used to estimate the BOD, and has a quantity of life component called years of life lost (YLL) and a quality of life component called years of life lost due to disability (YLD). Thus it calculates the amount of full health lost due to illness or injury. For more information see Murray & Lopez, 1996.

What is the burden of disease and injury in Australia caused by alcohol?

The BOD analysis for Australia[12] shows that the harmful effects of alcohol are distributed relatively evenly across all age groups and are much lower for females than males. However, almost all the benefits from alcohol are found in those aged over 45, with the most benefit in females aged 75 years and over (Figure 12, a & b).

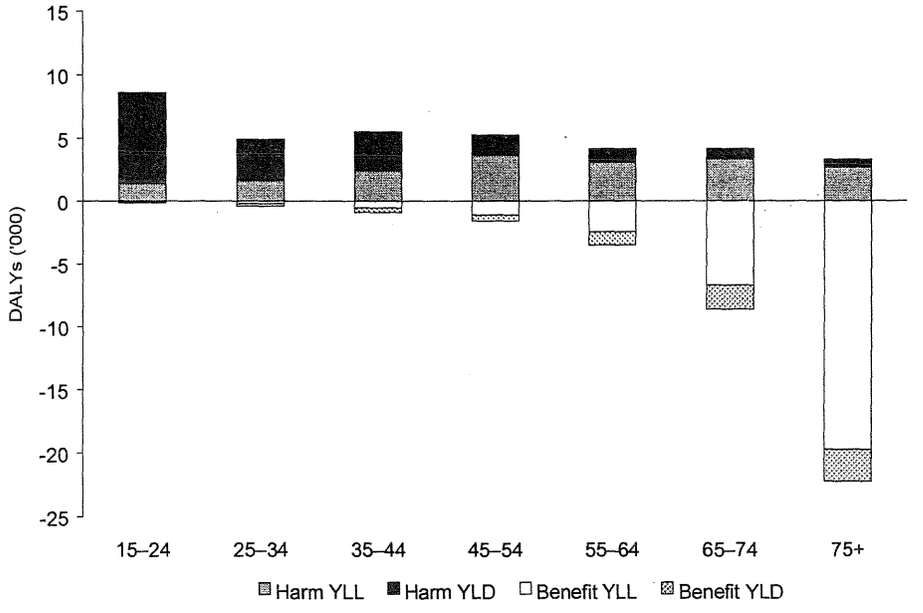
Figure 12: Burden of disease and injury attributable to the harmful and protective effects of alcohol, by age and sex, Australia, 1996

a) Males



[12] National data (from Mathers et al., 1999) are presented here because data for WA are not yet available, although the mortality component has been completed (Katzenellenbogen et al., 2003).

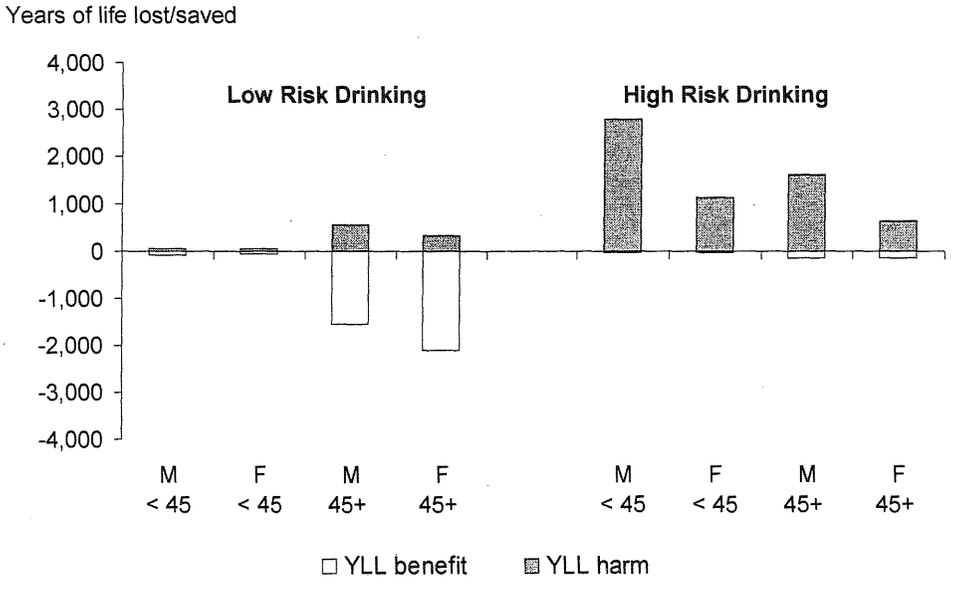
b) Females



What effect do low and high risk levels of drinking have on the burden of disease in Western Australia?

For people aged less than 45 years, low risk drinking has minimal harm or benefit in terms of years of life lost or saved. For over 45 year olds, low risk drinking confers a substantial benefit, and a relatively small burden. However, high risk drinking has minimal benefit and many more lives are lost than saved in all age groups (Figure 13).

Figure 13: The burden of disease and injury attributable to the harmful and beneficial effects of low–risk and high–risk drinking, by age and sex, WA, 2000



Source: Katzenellenbogen et al., 2003

6. Hospitalisation

Records for hospital separations which occurred between 1995 and 2001[13] and where the principal diagnosis or primary external code were due to conditions known to be related to alcohol were extracted from the Hospital Morbidity Data System.[14] This database is maintained by the Health Information Centre at the Department of Health, WA.

How many hospital admissions and beddays are caused or prevented by alcohol-related conditions?

Alcohol can have harmful effects, evident in acute and chronic conditions, and protective effects, which are only evident in chronic conditions.

Statewide in 2001, alcohol was responsible for a total of 8,196 hospital admissions and 43,238 beddays. However, 3,822 admissions and 17,066 beddays were prevented by alcohol use, resulting in 4,374 net admissions and 26,171 net beddays (Table 6).

[13] Hospitalisation data from July 1999 are coded to ICD-10. This is a different coding system to ICD-9, which was used previously, and therefore makes time trend analyses spanning the two coding systems difficult.

[14] The HMDS covers all public and private hospitals in WA, including the detoxification program run by Next Step but excluding psychiatric hospitals. Only episodes of treatment requiring an inpatient stay are captured on the HMDS, therefore alcohol-caused cases which received outpatient treatment are not included in this section.

Table 6: Alcohol-caused admissions and beddays by sex and condition, WA, 2001

	Number of admissions			Number of beddays		
	Male	**Female**	**#Persons**	**Male**	**Female**	**#Persons**
Alcohol harm (acute)						
*Alcoholic poisoning	16	21	37	18	24	42
*Aspiration	45	27	72	695	451	1,146
Fall injuries	647	376	1,023	5,255	3,447	8,702
Fire injuries	89	30	120	567	295	862
Drowning	6	1	7	10	3	12
Occupational & machine injuries	120	28	148	227	67	294
Suicide	371	495	866	2,307	2,400	4,707
Assault	806	511	1,316	2,082	1,333	3,415
Child abuse	13	9	22	53	50	103
Road injuries - vehicle	350	84	433	2,210	559	2,769
Road injuries - pedestrian	41	7	48	392	62	454
Total acute harm	*2,505*	*1,588*	*4,093*	*13,816*	*8,691*	*22,507*
Alcohol harm (chronic)						
*Alcoholic psychosis	260	76	336	2,694	405	3,099
*Alcohol dependence	443	276	719	2,958	2,144	5,102
*Alcohol abuse	778	469	1,247	1,620	1,093	2,713
*Alcoholic poly neuropathy	4	0	4	32	0	32
*Alcoholic cardiomyopathy	9	2	11	45	12	57
*Alcoholic gastritis	117	50	167	234	94	328
*Alcoholic liver cirrhosis	194	104	298	1,274	1,007	2,281
Oropharyngeal cancer	78	18	96	603	175	778
Oesophageal cancer	96	42	138	724	262	986
Liver cancer	43	13	56	258	128	386
Laryngeal cancer	53	3	56	384	8	393
Female breast cancer	0	176	176	0	619	619
Epilepsy	119	81	200	382	307	689
Hypertension	22	0	22	85	0	85
Oesophageal varices	33	11	44	88	19	107
Gastro-oesophageal haemorrhage	26	11	37	72	24	96
Acute pancreatitis	84	57	141	510	393	903
Chronic pancreatitis	143	58	201	601	270	870
Ischaemic heart disease	0	46	46	.	149	149
Heart failure	1	0	1	5	0	6
Psoriasis	12	9	21	111	85	196
Stroke	82	5	87	784	73	857
Total chronic harm	*2,597*	*1,506*	*4,103*	*13,464*	*7,267*	*20,731*
Total harm	*5,102*	*3,094*	*8,196*	*27,280*	*15,958*	*43,238*
Alcohol benefit (chronic)						
~Hypertension	0	-16	-16	0	-85	-85
~Stroke	-2	-539	-541	-17	-5,389	-5,405
Supraventricular cardiac dysrthythmias	-319	-186	-505	-643	-499	-1,142
Cholelithiasis	-288	-556	-844	-990	-1,585	-2,575
Ischaemic heart disease	-1,295	-404	-1,699	-4,519	-1,727	-6,247
Heart failure	-137	-79	-216	-990	-623	-1,613
Total alcohol benefit	*-2,041*	*-1,781*	*-3,822*	*-7,159*	*-9,908*	*-17,066*
Grand Total	**3,061**	**1,313**	**4,374**	**20,121**	**6,050**	**26,171**

~ alcohol only has a protective effect for these conditions in women.
** these conditions are wholly attributable to alcohol.*
 # The use of aetiologic fractions sometimes results in fractions of cases. Thus the number of persons may not equal the sum of males and females because numbers are rounded for presentation.

What were the top five alcohol-related conditions responsible for hospital admissions?

Five conditions were responsible for 63% of alcohol-caused hospital admissions[15] in 2001. These were:

1. assault (16.1%)
2. alcohol abuse (15.2%)
3. fall injuries (12.5%)
4. suicide (10.6%)
5. alcohol dependence (8.8%).

The top five conditions varied slightly for males and females. The top five conditions for **males**, responsible for 60% of alcohol-caused male admissions in 2001, were:

1. assault (15.8%)
2. alcohol abuse (15.3%)
3. fall injuries (12.7%)
4. alcohol dependence (8.7%)
5. suicide (7.3%).

The top five conditions for **females**, responsible for 69% of alcohol-caused female admissions in 2001, were:

1. assault (16.5%)
2. suicide (16.0%)
3. alcohol abuse (15.2%)
4. fall injuries (12.1%)
5. alcohol dependence (8.9%).

[15] To calculate the percentages of hospital admissions, conditions for which alcohol had a protective effect were excluded.

What were the top five alcohol-related conditions responsible for hospital beddays?

Five conditions were responsible for 58% of alcohol-caused hospital beddays[16] in 2001. These were:

1. fall injuries (20.1%)
2. alcohol dependence (11.8%)
3. suicide (10.9%)
4. assault (7.9%)
5. alcoholic psychosis (7.2%).

The top five conditions varied slightly for males and females. The top five conditions for **males**, responsible for 57% of alcohol-caused male beddays in 2001, were:

1. fall injuries (19.3%)
2. alcohol dependence (10.8%)
3. alcoholic psychosis (9.9%)
4. suicide (8.5%)
5. vehicular road injuries (8.1%).

The top five conditions for **females**, responsible for 65% of alcohol-caused female beddays in 2001, were:

1. fall injuries (21.6%)
2. suicide (15.0%)
3. alcohol dependence (13.4%)
4. assault (8.4%)
5. alcohol abuse (6.8%).

[16] To calculate the percentages of hospital beddays, conditions for which alcohol had a protective effect were excluded.

What is the impact of alcohol on admissions and beddays by sex and race?

There were differences in the impact of alcohol-caused hospitalisation by sex and race, with Aboriginal people deriving very little benefit from alcohol use. Overall, no group derived a net beneficial effect from alcohol use (Figures 14 & 15; Table 7).

Figure 14: The impact of alcohol on hospital admissions, WA, 2001

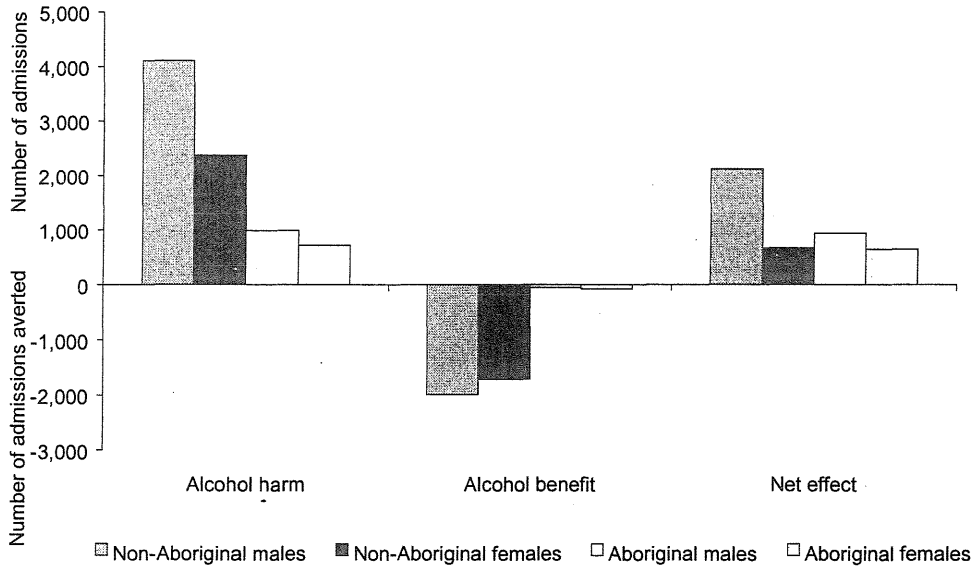


Figure 15: The impact of alcohol on hospital beddays, WA, 2001

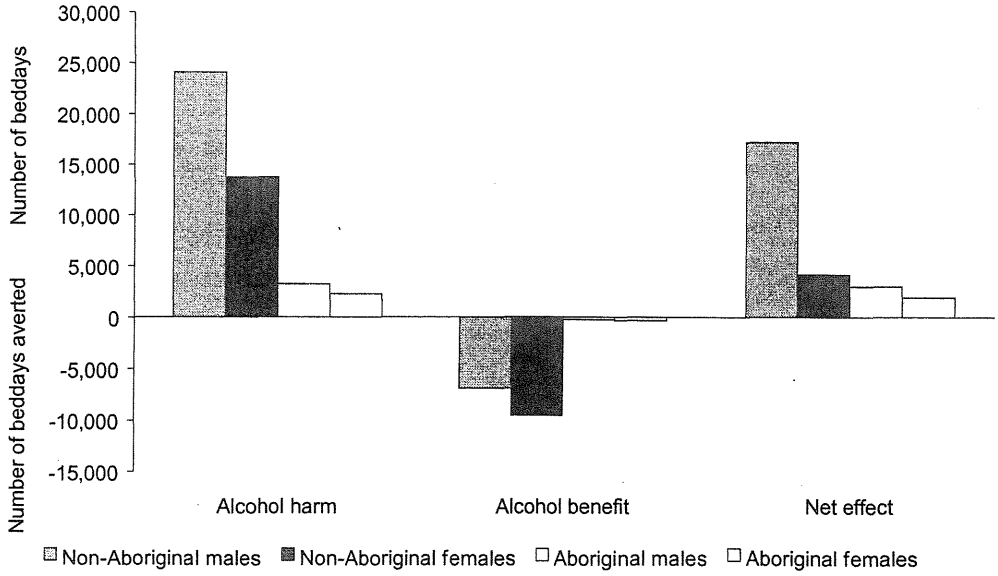


Table 7: Number of alcohol-caused admissions and beddays, by race and sex, WA, 2001

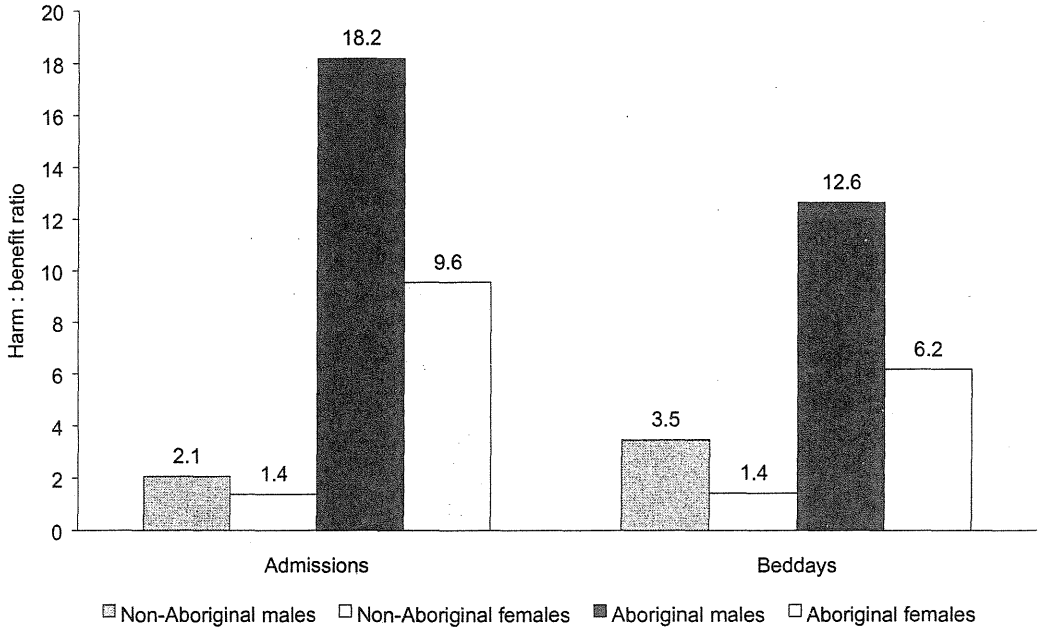
	Non-Aboriginals		Aboriginals		*Persons		
	Male	Female	Male	Female	Male	Female	Total
Admissions							
Alcohol harm	4,110	2,375	991	719	5,102	3,094	8,196
Alcohol benefit	-1,986	-1,706	-54	-75	-2,041	-1,781	-3,822
Net effect	2,124	669	937	644	3,061	1,313	4,374
Beddays							
Alcohol harm	24,052	13,692	3,228	2,266	27,280	15,958	43,238
Alcohol benefit	-6,903	-9,540	-255	-367	-7,159	-9,908	-17,067
Net effect	17,148	4,152	2,973	1,898	20,121	6,050	26,171

** This includes cases where Aboriginality was missing, so the sum of the non-Aboriginal and Aboriginal cases does not add up to the total number of persons.*

A harm to benefit ratio was calculated by dividing the number of alcohol-caused admissions or beddays by the number of admissions or beddays averted by alcohol.

For Aboriginal males, the harm to benefit ratio for admissions was more than 8 times higher than that for non-Aboriginals, and the ratio for beddays was 3.6 times higher than the non-Aboriginal ratio. For Aboriginal females, the harm to benefit ratio for admissions was nearly 7 times higher than that for non-Aboriginals, and the ratio for beddays was 4.4 times higher than that for non-Aboriginals (Figure 16).

Figure 16: Alcohol-caused hospitalisation, harm : benefit ratios, by race and sex, WA, 2001



How much does alcohol-caused hospitalisation cost?

There was a significant increase in the number of alcohol-caused admissions (t-score=3.4; p=0.042) over the period 1995 to 2001 (Table 8). The overall cost of

alcohol-caused admissions more than doubled over the same period due to the increase in the number of admissions, and the cost per admission increased from $1,085 in 1995 to $1,885 in 2001, although these increases were not significant.

Table 8: Number of alcohol-caused admissions and the cost of hospitalisation, WA, 1995-2001

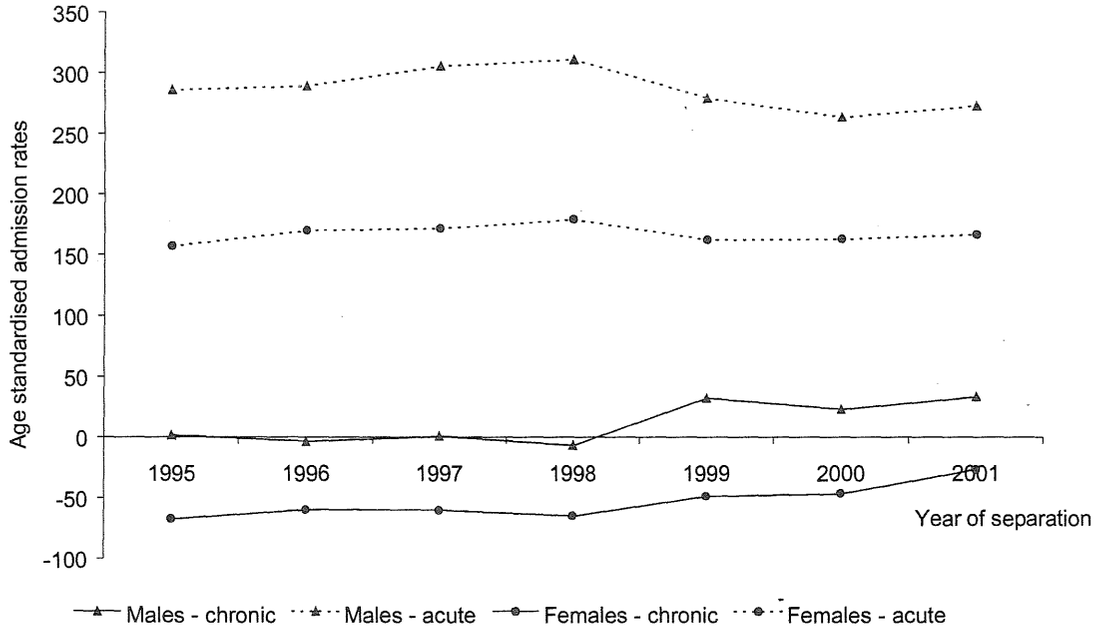
Year	Total admissions	Total cost (ANDRG)[17]	Cost per admission
1995	3,652	$3,964,383	$1,085
1996	3,831	$5,439,433	$1,420
1997	4,047	$6,616,635	$1,635
1998	4,090	$7,186,135	$1,757
1999	4,155	$6,103,087	$1,469
2000	3,956	$6,387,806	$1,615
2001	4,374	$8,244,376	$1,885

[17] Costs were calculated using ANDRG costweights. From 1995 to 2000 version 3.1 was used, and for 2001 version 4.1 was used.

What has been the trend in alcohol-caused admissions and beddays for acute and chronic conditions over the last seven years?

Age-standardised admission rates (ASRs)[18] for chronic alcohol-caused conditions among females increased significantly (t-score=4.0; p=0.028), i.e. less admissions were prevented, over the 7-year period. However, ASRs for chronic conditions among males and acute conditions in both sexes showed no significant changes (Figure 17).

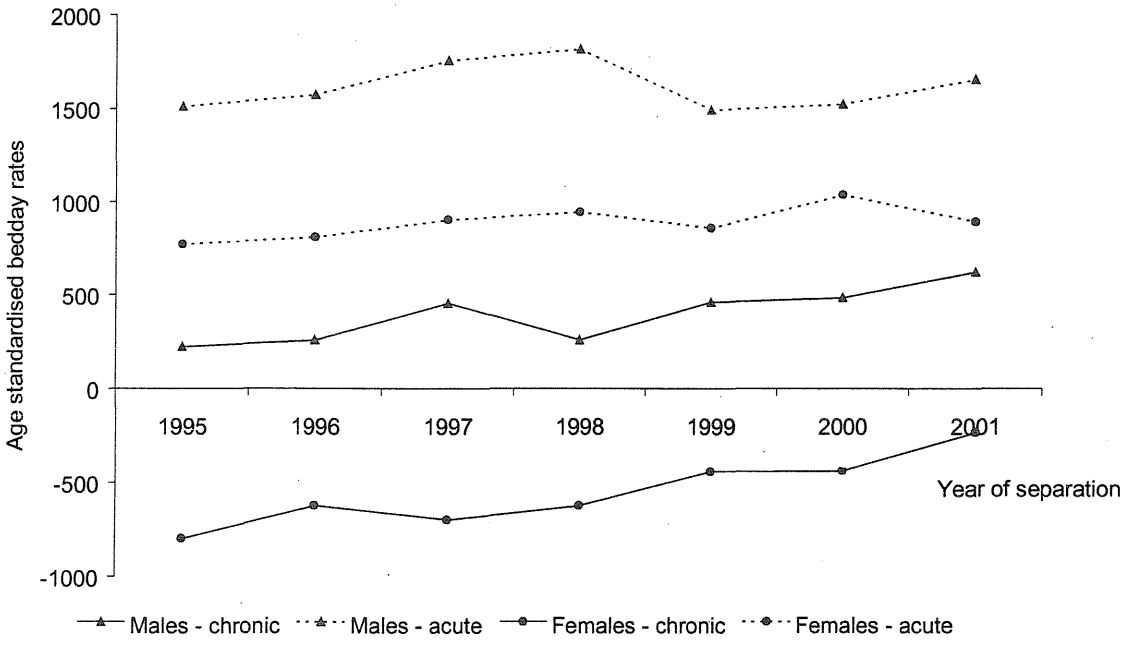
Figure 17: Age-standardised rates for alcohol-caused admissions by year of separation, WA, 1995-2001



For beddays, ASRs for chronic conditions significantly increased for both males (t-score=3.6; p=0.036) and females (t-score=6.0; p=0.009), i.e. less beddays were prevented, over the 7-year period. However, ASRs for acute conditions in both sexes showed no significant changes (Figure 18).

[18] The statistical methods used are detailed in the Glossary.

Figure 18: Age-standardised rates for alcohol-caused beddays by year of separation, WA, 1995-2001



What is the age pattern of admissions and beddays due to alcohol-caused chronic and acute conditions?

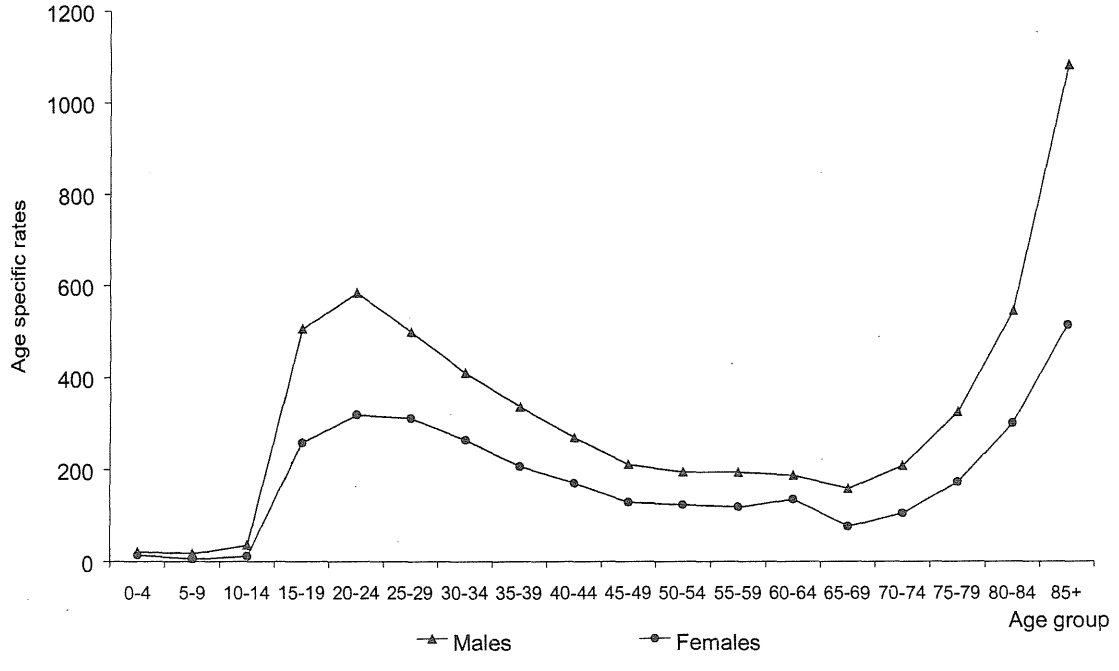
Acute

The pattern of male age-specific admission rates due to acute alcohol-caused conditions was similar to those for deaths. The admission rates rose steeply in the 15 to 19 years age group and peaked in the 20-24 years age group (584 admissions per 100,000 population). After that, male rates declined until the age of 69 years before rising again.

Female admission rates due to acute alcohol-caused conditions followed a similar pattern to that for males, but male age-specific admission rates were higher than those for females in all age groups, especially between the ages of 15 and 39 years (Figure 19).

Although not shown, the age-specific rates for alcohol-caused beddays followed a pattern similar to that for admissions, but the peak in 15 to 29 year olds was not as pronounced.

Figure 19: Age-specific admission rates for alcohol-caused acute conditions by sex, WA, 1995-2001



Chronic

Generally, for admissions due to chronic alcohol-caused conditions, the protective effect of alcohol did not take effect until the age of 55 years for both sexes (Figure 20; Table 9).

Although not shown, the age-specific rates for alcohol-caused beddays followed a pattern similar to that for admissions.

Figure 20: Age-specific admission rates for alcohol-caused chronic conditions by sex, WA, 1995-2001

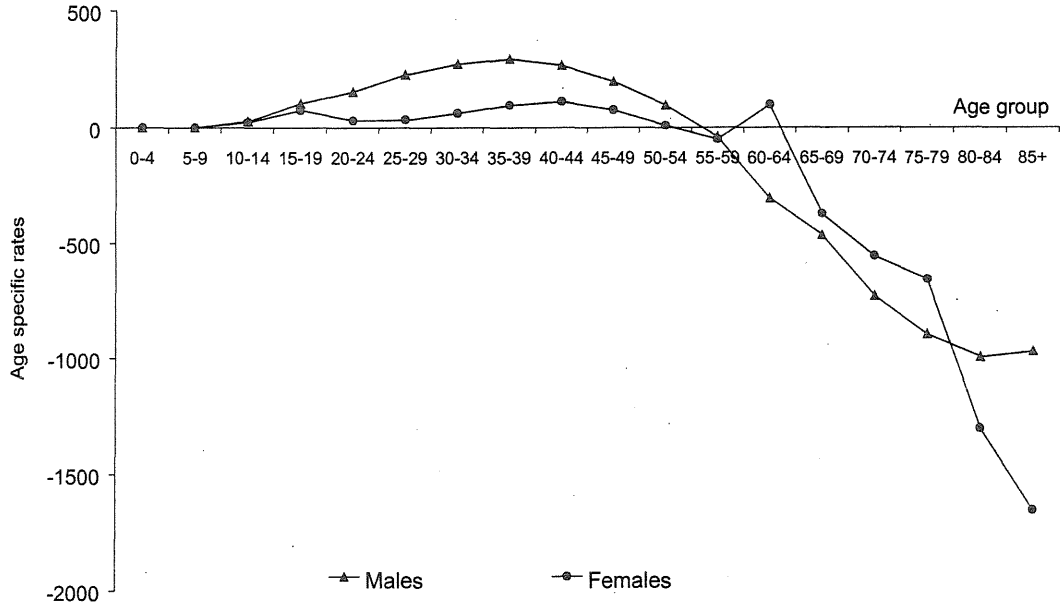


Table 9: Estimated number of alcohol-caused admissions by age group and sex, WA, 2001

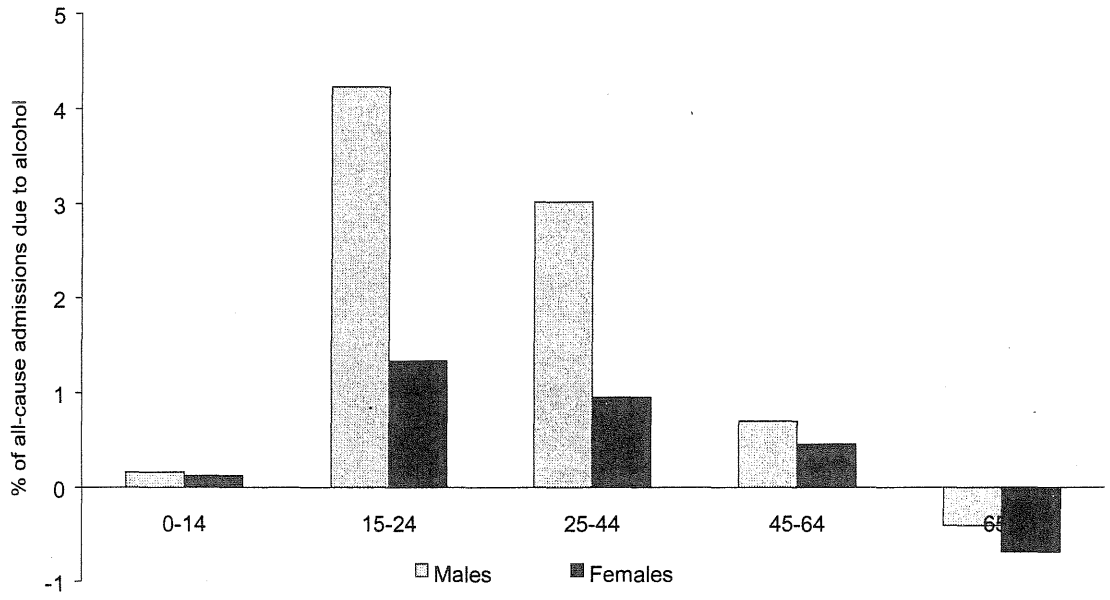
	0-14 yrs	15-24 yrs	25-44 yrs	45-64 yrs	65+ yrs
Male	72	860	1,905	594	-371
Female	44	457	1,034	405	-627
Persons	117	1,317	2,940	999	-998

What proportion of all hospital admissions is due to alcohol by age group?

An estimated 1.0% of all male admissions and 0.4% of all female admissions were due to alcohol. The highest proportion of alcohol-caused admissions was among young people aged 15 to 24 years (males 4.2%; females 1.3%).

In people aged 65 years and above, 0.4% of male admissions and 0.7% of female admissions were averted through alcohol use (Figure 21).

Figure 21: Alcohol-caused admissions as a percentage of all admissions, by age group, WA, 2001



How many alcohol-caused admissions and beddays are wholly attributable to alcohol use?

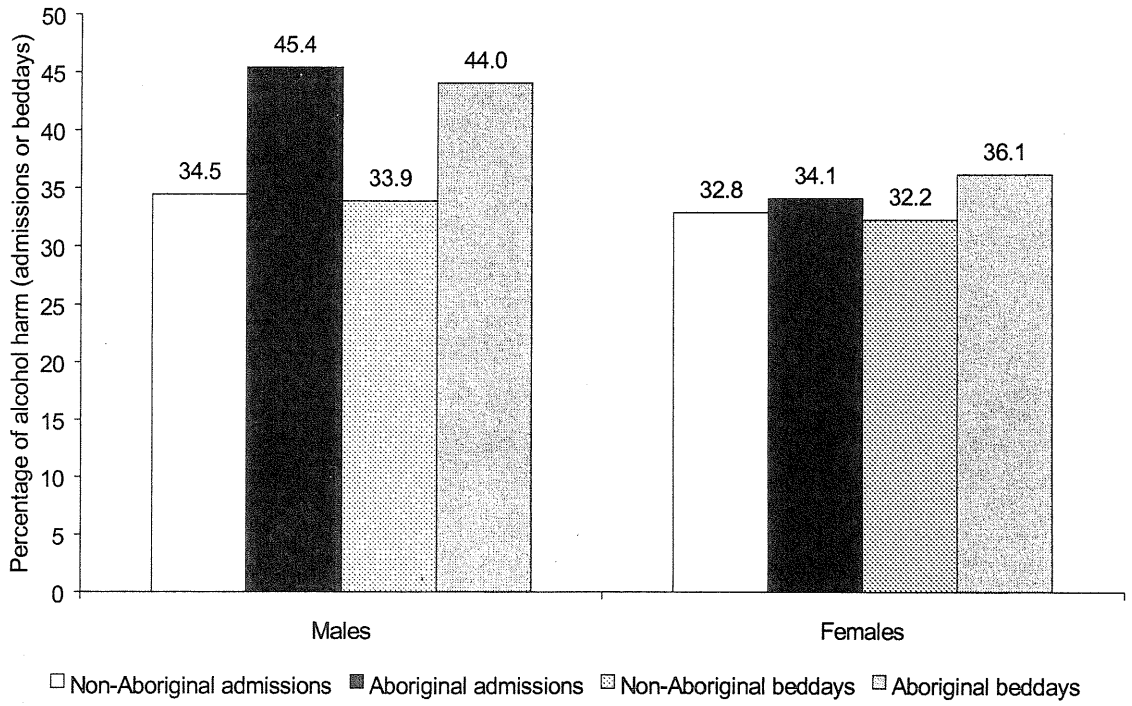
During 2001, 35% of hospital admissions and 34% of beddays from the harmful effects of alcohol (i.e. not including those conditions for which alcohol had a protective effect) were wholly attributable to alcohol[19].

The proportion of alcohol harm that was wholly attributable differed between males and females and Aboriginals and non-Aboriginals (Figure 22).

For non-Aboriginal males, 34.5% of alcohol-caused admissions and 33.9% of alcohol-caused beddays were due to wholly attributable conditions, whereas for Aboriginal males the proportions were 45.4% for admissions and 44.0% for beddays.

Racial differences were not so pronounced for females. Among non-Aboriginals 32.8% of alcohol-caused admissions and 32.2% of alcohol-caused beddays were due to wholly attributable conditions, whereas for Aboriginals the proportions were 34.1% and 36.1% respectively.

Figure 22: Percentage of alcohol harm (admissions and beddays) wholly attributable to alcohol, WA, 2001



[19] Conditions wholly attributable to alcohol are indicated in Table 6. The concept of wholly attributable conditions is explained in the Mortality and Morbidity Data section.

7. Emergency Department data

Data from metropolitan emergency departments (ED) are presented here. ED visits were classed as alcohol-related if there was any mention of alcohol in the discharge and/or presenting complaint fields. This means conditions that may be due to chronic alcohol consumption, such as stroke or ischaemic heart disease, were not included. Thus, the number of alcohol-related ED visits is likely to be grossly underestimated.[20]

How many visits to metropolitan emergency departments are alcohol-related?

Although less than one percent of visits to metropolitan EDs appear to be alcohol-related, the proportion of alcohol-related visits steadily increased over the six-year period. There was a significant increase (t-score=8.7; p=0.003) in the percentage of all ED visits that were alcohol-related, from 0.56% to 0.85% (Table 10).

Table 10: Number of alcohol-related visits to metropolitan emergency departments by year, WA, 1993-1998

Year	Discharge[a]	Admission[b]	Both[c]	Any[d]	All cause[e]	% Any[f]
1993	430	697	178	1,305	232,358	0.56
1994	539	767	179	1,485	229,333	0.65
1995	619	812	182	1,613	221,979	0.73
1996	674	882	214	1,770	225,854	0.78
1997	751	940	312	2,003	235,243	0.85
1998	941	630	428	1,999	236,042	0.85
Total	**3,954**	**4,728**	**1,493**	**10,175**	**1,380,809**	**0.74**

a alcohol mentioned in the discharge diagnosis field only.

b alcohol mentioned in the presenting complaint field only.

c alcohol mentioned in both the discharge diagnosis field and the presenting complaint field.

d with any mention of alcohol (i.e. the sum of a + b + c).

e all records (including d) .

f percentage of all-cause records with any mention of alcohol.

[20] Another problem likely to cause underestimation is the poor quality of the ED data. The discharge and presenting complaint fields are text fields and cases were selected by searching on various terms, including: alcohol, alc, ETOH, intox, drunk, ethanol, hangover, and inebriat. However, some typing errors and slang terms may have been missed.

8. Utilisation of treatment and support services

8.1 Sobering up centres

The first sobering up centre (SUC) was opened in 1990 after the enactment of the Detention of Drunken Persons Act 1989 to decriminalize public drunkenness in WA. SUCs give overnight care to intoxicated adults found in public places. Clients are provided with a meal, clean bedding and sleepwear and their clothes are laundered in an effort to break the negative cycle of alcohol induced harm (WA Drug Abuse Strategy Office, 1999).

The benefits for communities in which the SUCs have been established include reductions in: police time and resources; the use of court time and resources; the levels of domestic violence and other problems associated with alcohol abuse; and the burden on the health system (WA Drug Abuse Strategy Office, 1999).

What is the trend in admissions to sobering-up centres?

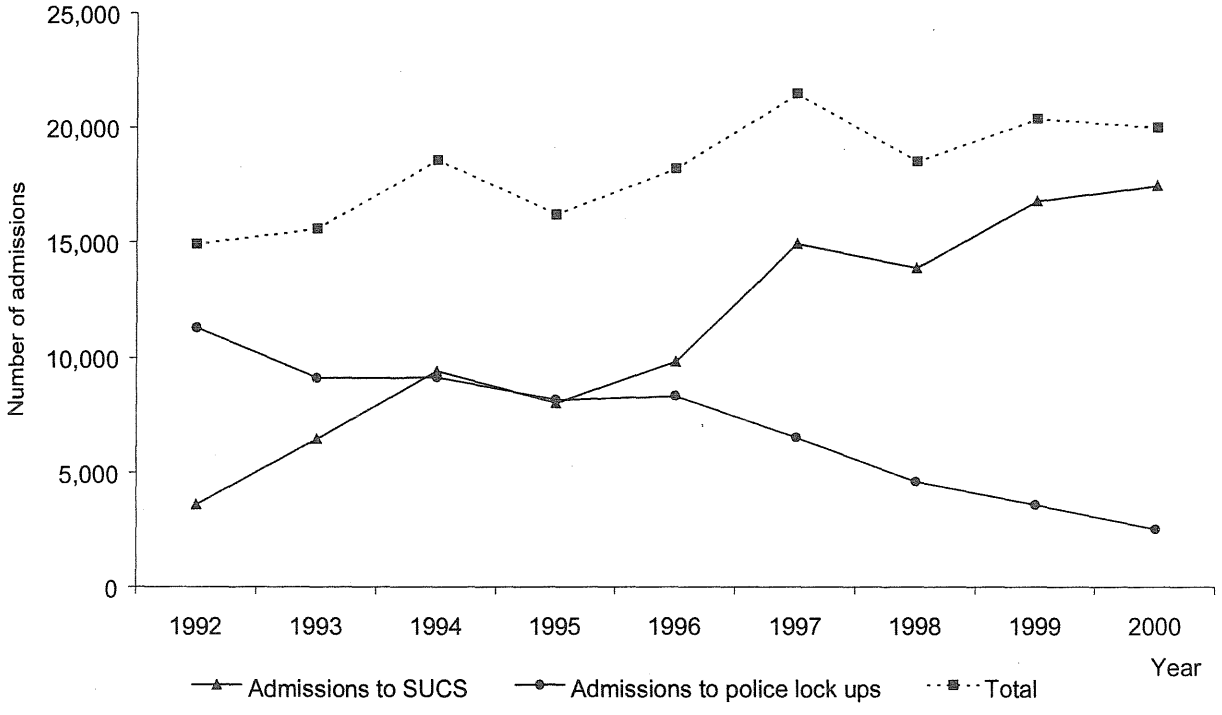
It is difficult to quantify trends in admissions to SUCs because they have been opened in a staggered fashion so their combined capacity has gradually increased over the period.[21] However, as the number of available places at SUCs increased admissions to police lock ups decreased (Figure 23). Males accounted for between 65% and 75% of admissions to SUCs over the period 1992 to 2000 (Table 11).

Table 11: Number of admissions to SUCs by sex, WA, 1992-2000

Year	No. of SUCs	Number of admissions to SUCs			% males admitted
		Males	Females	Persons	
1992	3	2,688	925	3,613	74.4
1993	4	4,833	1,635	6,468	74.7
1994	6	6,775	2,653	9,428	71.9
1995	6	5,838	2,198	8,036	72.6
1996	8	6,746	3,107	9,853	68.5
1997	8	10,156	4,798	14,954	67.9
1998	9	9,557	4,351	13,908	68.7
1999	10	11,083	5,708	16,791	66.0
2000	10	11,393	6,075	17,468	65.2

[21] Sobering up shelters opened in: Perth, May 1990; Port Hedland, April 1991; Halls Creek, September 1992; Roebourne, February 1993; Fitzroy Crossing, March 1994; Kalgoorlie, June 1994; Wiluna, April 1996; Kununurra, September 1996; Derby, May 1998; and Broome, February 1999.

Figure 23: Number of admissions to SUCS and police lock ups by year, WA, 1992-2000



8.2 Next Step Specialist Drug and Alcohol Services

The type of alcohol treatment programs offered by Next Step Specialist Drug and Alcohol Services (Next Step) include inpatient and outpatient detoxification, counselling, pharmacotherapy treatment (acamprosate and naltrexone), and group therapy.

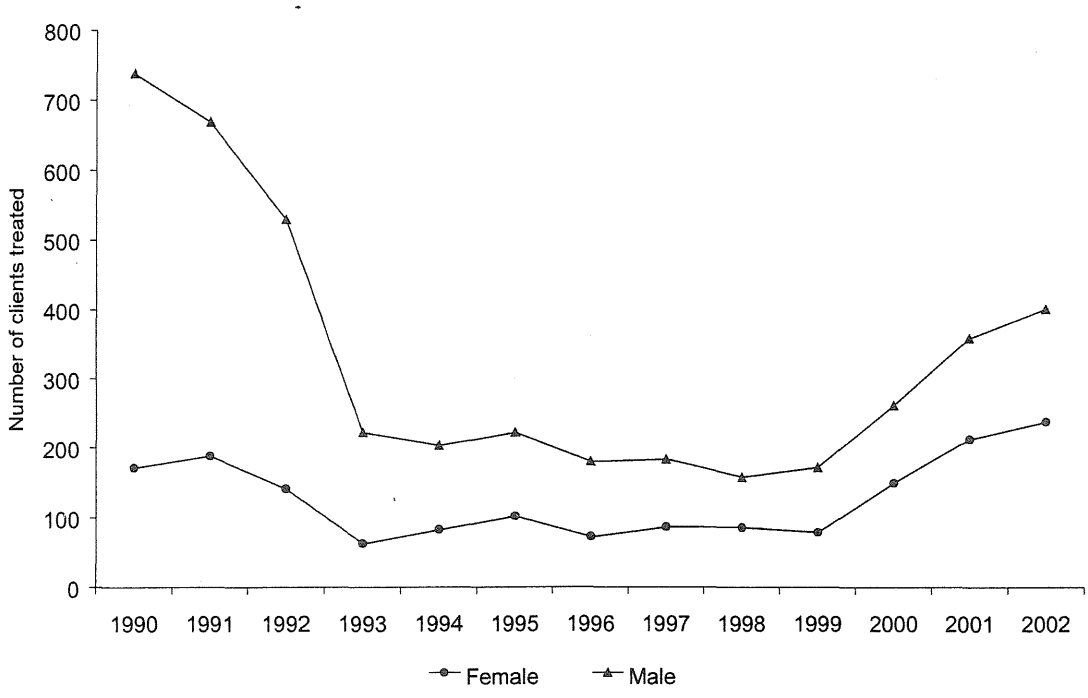
How many people have been admitted to alcohol treatment programs at Next Step?

Over the last 13 years 5,960 people (4,291 males; 1,669 females) have been admitted to alcohol treatment programs at Next Step.

What has the trend in admissions to alcohol treatment programs at Next Step been over the last thirteen years?

In 1990, 738 males and 171 females were admitted, but then numbers decreased until 1993. The number of people admitted remained fairly stable until 1999, but since then numbers have increased for both sexes (Figure 24).

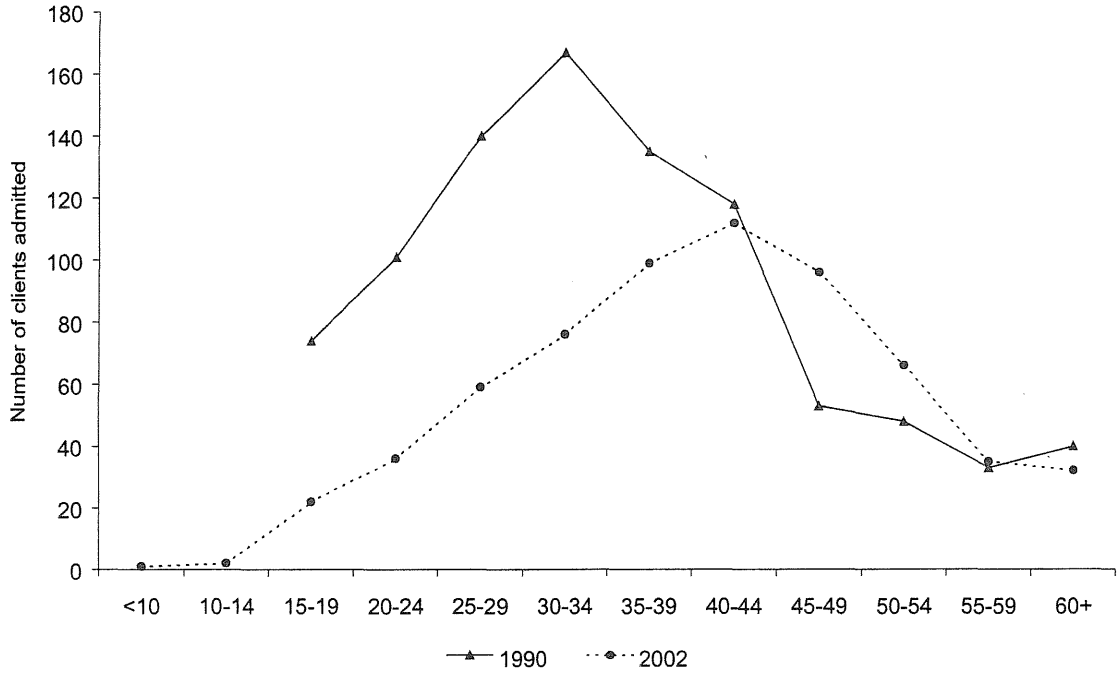
Figure 24: Number of people admitted to alcohol treatment programs at Next Step, by sex and year, 1990-2002



How old are people who have been admitted to alcohol treatment programs at Next Step?

The age of admission for alcohol dependents at Next Step increased over the period 1990 to 2002. In 1990 the highest number of people admitted (167 or 18.4%) occurred in the 30 to 34 years age group, whereas in 2002 the highest number (112 or 17.6%) was in the 40 to 44 years age group (Figure 25).

Figure 25: Number of people admitted to alcohol treatment programs at Next Step, by age group, 1990 and 2002



8.3 Non-Government agencies

The Drug and Alcohol Office (DAO) funds some alcohol treatment programs at non-government agencies (NGOs), including withdrawal programs, counselling, education and information, rehabilitation, and pharmocotherapy support and assessments.

The data presented here comes from the PICASO (Performance Indicator Client and Services Online) system – an administrative and statistical database containing data from all DAO-funded agencies.

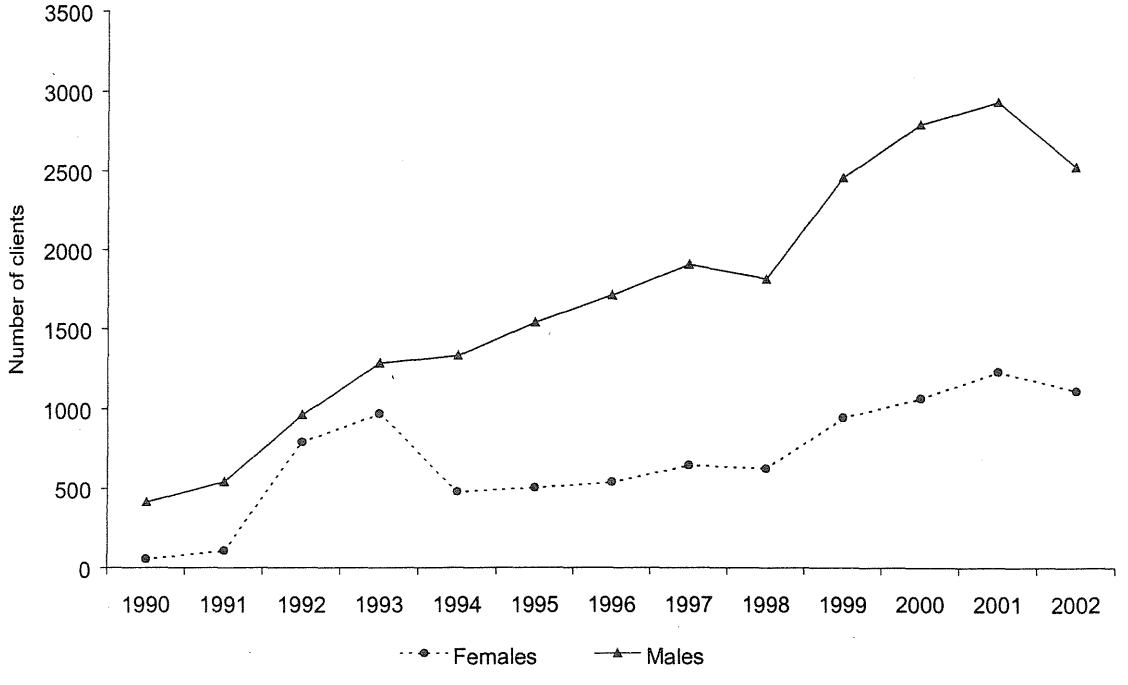
How many people were treated for alcohol problems at NGOs funded by DAO?

Over the last 13 years, 31,336 people (22,224 males; 9,101 females; 11 unstated) have accessed alcohol treatment programs at NGOs funded by DAO.[22]

What has been the trend in admissions to alcohol treatment programs at DAO-funded NGOs over the last thirteen years?

It is difficult to quantify trends in the number of clients admitted for alcohol-related treatment to DAO-funded NGOs because the data reflect when PICASO was introduced to the agencies and the NGOs began providing data to DAO (Figure 26).

Figure 26: Number of clients admitted to alcohol programs at non-government agencies funded by the Drug and Alcohol Office, by sex and year, 1990-2002



[22] A limitation of the database is that unique clients cannot be identified. As clients can be referred from one NGO to another and also between Next Step and DAO-funded NGOs the numbers of clients may be overestimated.

8.4 Alcohol and Drug Information Service

A broad measure of public concern about problems stemming from alcohol misuse is the number of alcohol-related calls to the Alcohol and Drug Information Service (ADIS), a 24-hour telephone information, counseling, referral and consultancy service.

What is the trend in alcohol-related calls to the Alcohol and Drug Information Service?

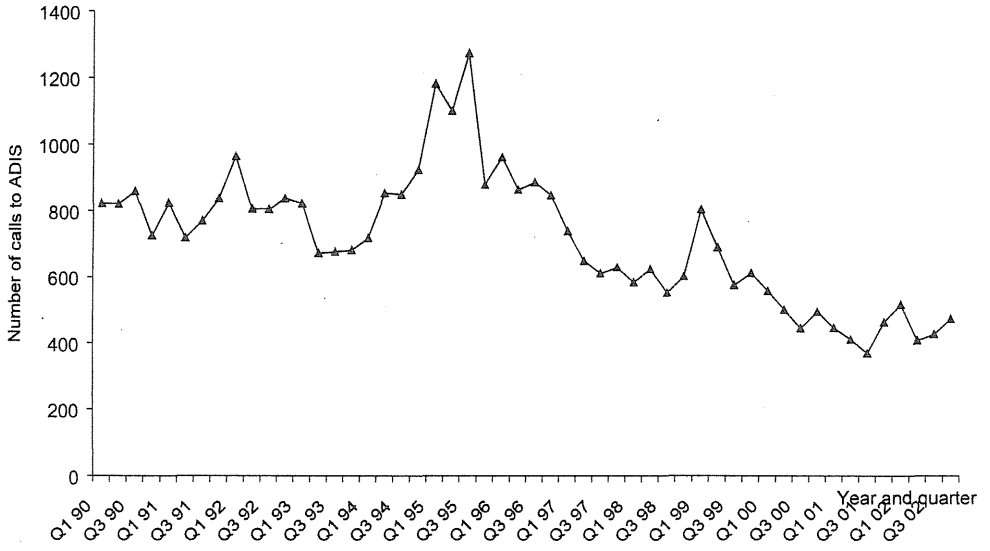
Alcohol is the most common drug of concern for callers to ADIS, with the highest number of calls occurring in 1995 (4,437 calls). Over the last twelve years there has been no significant reduction in the annual number of calls to ADIS regarding alcohol, but the patterns of use have changed somewhat.

Ten years ago (female) partners of (male) problematic drinkers tended to ring up to find out how they could better support the drinker. Now (male) problem drinkers are more likely to ring up about their own drinking.[23]

The fluctuation from quarter to quarter in the number of calls related to alcohol (Figure 27) may reflect:

- health promotion messages in the media
- the introduction of new legislation, e.g. the blood alcohol concentration allowed for driving was reduced to 0.05g/100ml in 1992
- seasonal fluctuations in drinking patterns, or concern about drinking patterns.

Figure 27: Alcohol-related calls to ADIS, 1990-2002



[23]For every homeless female alcoholic there are 100 homeless male alcoholics.
Information derived from personal communication with Francesca Robinson, Coordinator, ADIS, 2003.

9. Conclusion

Alcohol can have harmful and protective effects. The harmful effects are evident in both acute and chronic conditions, while protective effects are only evident in chronic conditions, which mainly affect the elderly, so the benefits of alcohol use are not seen until old age.

The information presented in this report shows that, even taking the benefits of low levels of alcohol consumption into account, alcohol misuse has a significant impact on the health of Western Australians.

10. Glossary of statistical methods

Per capita alcohol consumption was calculated by dividing litres of absolute alcohol by the population. A quadratic model was fitted to the data and an autoregression conducted to test whether linear and non-linear time functions were significant (using SPSS 10.0). Results at $p<=0.05$ are reported as statistically significant.

Age-specific rates are rates for specific age groups, with the numerator and denominator relating to the same age group. They are expressed as rates per 100,000 person-years.

Age-standardised rates (ASR) are used to eliminate the effect of different age distributions, so groups with differing age compositions can be compared. An age-standardised rate is the weighted average of age-specific rates according to a standard distribution of age. In this report the Australian 2001 population was used as the standard population. ASRs were calculated using the Rates Calculator[24] using the direct method (Rothman, 1986) and expressed as rates per 100,000 person-years.

Time trend analyses were performed at the 95% confidence interval level, based on the t-distribution of a Pearson correlation coefficient. The method used is described in Snedecor & Cochran (1980). Results at $p<=0.05$ are reported as statistically significant.

Person years of life lost (PYLL) measures the level of premature death in the population. The number of PYLL to 74 years were calculated using the Rates Calculator, which uses the method described in Hakulinen and Teppo (1976). The number of PYLLs per death gives a measure of premature death at the individual level, while the number of PYLLs per 1,000 population gives a measure of premature death at the population level.

Harm to benefit ratios were calculated by dividing the number of cases of alcohol-caused harm (e.g. deaths) by the number of cases of alcohol-caused benefit (e.g. lives saved).

[24] The Rates Calculator was developed by Dr Jim Codde, Director of the Epidemiology Branch at the Department of Health, Western Australia.

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Appendix

Table A1: Summary of the original alcohol consumption guidelines

	Number of standard drinks		
	Low risk	**Hazardous**	**Harmful**
MALES			
On an average day	up to 4 per day	more than 4, up to 6 per day	more than 6 per day
Overall weekly level	up to 28 per week	more than 28, up to 42 per week	more than 42 per week
FEMALES			
On an average day	up to 2 per day	more than 2, up to 4 per day	more than 4 per day
Overall weekly level	up to 14 per week	more than 14, up to 28 per week	more than 28 per week

Source: NHMRC, 1987.

Table A2: Summary of the new alcohol consumption guidelines

a) For risk of harm in the short-term

	Number of standard drinks		
	Low risk	**Risky**	**High Risk**
MALES			
On any one day	up to 6 on any one day, no more than 3 days per week	more than 6, up to 10 on any one day	more than 10 on any one day
FEMALES			
On any one day	up to 4 on any one day, no more than 3 days per week	more than 4, up to 6 on any one day	More than 6 on any one day

Source: NHMRC, 2001.

b) For risk of harm in the long term

The new guidelines for long term harm are equivalent to the original guidelines shown in Table A1.

'Risky' and 'High risk' in the new guidelines are equivalent to 'Hazardous' and 'Harmful' in the original guidelines ('low risk' is the same).