

Correlates of risky alcohol consumption in regional and remote Australia

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Abstract

Aim

To investigate the correlates of risky alcohol consumption in regional and remote Australia using the National Drug Strategy Household Survey.

Methods

The 2007 National Drug Strategy Household Survey is the latest in the leading series of epidemiological surveys in Australia regarding knowledge, attitudes and use of tobacco, alcohol and illicit drugs.

In scope for the survey are people aged 12 years and over living in residential households; the survey covered all of Australia. Data were collected under two survey modes: 'drop-and-collect' (self complete questionnaire) and computer-assisted telephone interview.

Univariate, bivariate and multivariate (logistic regression) analyses were used to explore the relationship between socio-demographic characteristics, geographic region, and risky/high risk alcohol consumption.

Results

The survey obtained responses from more than 23,000 people, with an overall response rate of 51%.

The prevalence of short-term risky alcohol consumption increases with increasing remoteness, from around 19% in major cities to 31% in remote areas. Other socio-demographic factors—each associated with increased risky consumption—are also correlated with increasing remoteness. For each remoteness area, risky/high risk alcohol use was most strongly predicted by the degree of alcohol use among peers, followed by age and smoking status.

Conclusion

The results suggest that the policy options currently being considered by the National Preventative Health Taskforce—with a focus on addressing the cultural place of alcohol—would be highly relevant for reducing the harms associated with risky alcohol consumption in regional and remote Australia.

Introduction

A long-standing policy focus in Australia relates to reducing the harms associated with alcohol, partly in recognition that alcohol consumption accounts for 3.2% of the total burden of disease and injury in Australia: 4.9% in males and 1.6% in females.¹ In economic terms, the annual cost to the Australian community from alcohol-related harm is estimated to be more than \$15 billion.²

The policy focus has recently been invigorated by the discussion paper of the National Preventative Health Taskforce.³ Further, the Council of Australian Governments has asked the Ministerial Council on Drug

Strategy to advise on options to reduce binge drinking, including in relation to closing hours, responsible service of alcohol, reckless secondary supply of alcohol and the alcohol content in ready-to-drink beverages.⁴

The Australian Institute of Health and Welfare has previously demonstrated, using data from the National Drug Strategy Household Survey (NDSHS) series, increased risky alcohol consumption with increasing remoteness.^{5,6} For example, in 2004 males in remote/very remote areas were 38% more likely to drink at harmful levels than males in major cities.

In this paper we update and extend the previous work by undertaking logistic regression analyses on a range of socio-demographic, attitudinal and behavioural variables to elicit the factors most associated with risky alcohol consumption. We expect that an understanding of the correlates of risky alcohol consumption and their distribution across regional and remote Australia will offer clues to better targeted, and therefore more effective, risk prevention interventions.

Methods and statistical analyses

We used data from the 2007 National Drug Strategy Household Survey—the latest in the leading series of epidemiological surveys in Australia regarding knowledge, attitudes and use of tobacco, alcohol and illicit drugs.

Households were selected by a multistage, stratified area random sample design. Minimum sample sizes sufficient to return reliable strata estimates were allocated to states and territories, and the remainder distributed in proportion to population size.

The survey employed two collection modes: drop and collect and the computer-assisted telephone interview (CATI). The sample was designed so that each method was implemented in separate census collection districts. For the drop and collect mode, data were collected from a national random selection of households, using self-completion booklets. Two attempts were made by the interviewer to personally collect the completed questionnaire; a reminder telephone call was made if necessary. The respondent was the household member aged 12 years or older whose birthday was next. The number of respondents who completed the survey from this sample was 19,818.

Data from computer-assisted telephone interviews were collected from a national random selection of households. As in the drop and collect sample, the respondent was the household member aged 12 years or older whose birthday was next. The number of respondents who completed the survey from this sample was 3,538. Due to the practical limitations of the CATI method, some questions were omitted in this mode.

Not all respondents were asked all questions: a separate, shorter questionnaire was administered to 12–13-year-olds in order to minimise respondent burden.

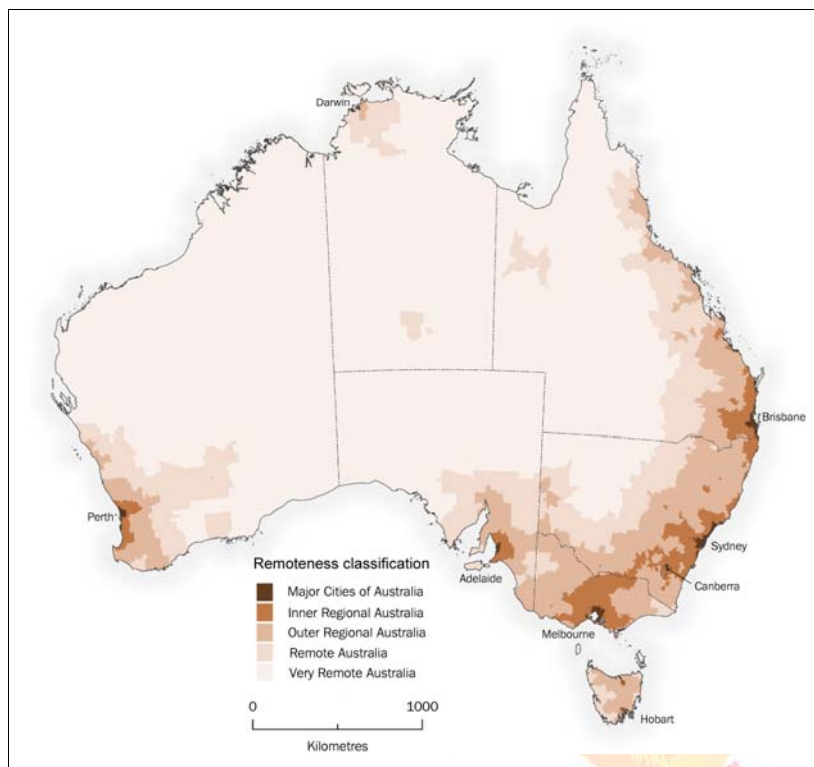
Persons aged 12–15 years of age completed the survey with the consent of the adult responsible for the adolescent at the time of consent.

The sample was designed to provide a random sample of households within each geographic stratum. Respondents within each stratum were assigned weights to overcome imbalances arising in the design and execution of the sampling.⁷

We used the Australian Standard Geographic Classification Remoteness Area (ASGC RA) categories as published by the Australian Bureau of Statistics.⁸ This determines an index value based on the distance of

a locality to five categories of service centre. These index values, ranging from 0–15, are then divided into five levels: major cities (MC), inner regional (IR), outer regional (OR), remote (R) and very remote (VR). A sixth level—migratory—is used for offshore areas. The distribution of the five ASGC RA levels is depicted in Figure 1.

Figure 1 Geographic distribution of ASGC Remoteness Areas



Source: ABS.

For this analysis, we combined respondents from the remote and very remote areas into a single category due to the small sample size from these areas and the relatively small population size represented by those samples.

The dependent variable we analysed was short term risky or high risk alcohol use, as described by the NHMRC.⁹ We derived a measure of this from questions relating to the respondent's history of alcohol use and detailed consumption patterns over the past 12 months. This measure—one of four alcohol risk measures reported over survey waves by the AIHW—was collapsed to a dichotomous variable: risky or high risk on a monthly basis (1), and low risk/abstainer (0), appropriate for binary logistic regression.

We initially conducted a set of univariate and bivariate analyses (crosstabulations and simple logistic regressions) to explore candidate variables associated with higher proportions of risky/high risk consumption. From this, eleven independent variables (not including ASGC RA) were selected for multivariate analysis using logistic regression models (with the forward stepwise (likelihood ratio) method), both for all of Australia and for each level of ASGC RA. This method adds variables one at a time—based on their influence in predicting the outcome—until substantively no more predictive power is added. Some of the variables were simplified to fewer levels, or collapsed to dichotomous variables, to produce more parsimonious models and aid in interpretation. The variables and their categories are shown in Table 1; the bolded category is the reference category for that variable in the regression models.

Table 1 Independent variables selected for the regression models

Variable	Categories (Bold = reference value)
Sex	Male; Female
Age group	12–19; 20–29; 30–39; 40–49; 50–59; 60+
Employment status	Currently employed; Student; Unemployed; Engaged in home duties; Retired or on a pension ; Unable to work; Other
Main language	English ; Other
Socio-economic status ^(a)	1 (Least advantaged); 2; 3; 4; 5 (Most advantaged)
Marital status	Never married; Divorced/separated/widowed; Married/de facto
Indigenous status	Indigenous; Not Indigenous
Ease of access to alcohol	Probably impossible ; Very difficult; Fairly difficult; Fairly easy; Very easy; Don't know
Proportion of friends use alcohol	All; Most; About half; A few; None
Problem perception ^(b)	Alcohol; Not alcohol
Smoking status	Smoker; Non-smoker

(a) Using Socio-Economic Indexes for Areas: Index of Relative Advantage/Disadvantage.

(b) Response to the question 'When people talk about "a drug problem", which drug do you first think of?'

We constructed a modified case weight for use in the logistic regression: this retained the relative contribution of each case to the file but removed the population expansion factor in the main survey weight and further scaled down each weight to account for the overall design effect of the survey (the design effect being the ratio of the variance achieved by the actual sample to the variance achieved from a simple random sample of the same size). All analyses were conducted in *SPPS Statistics 17.0*.

Results

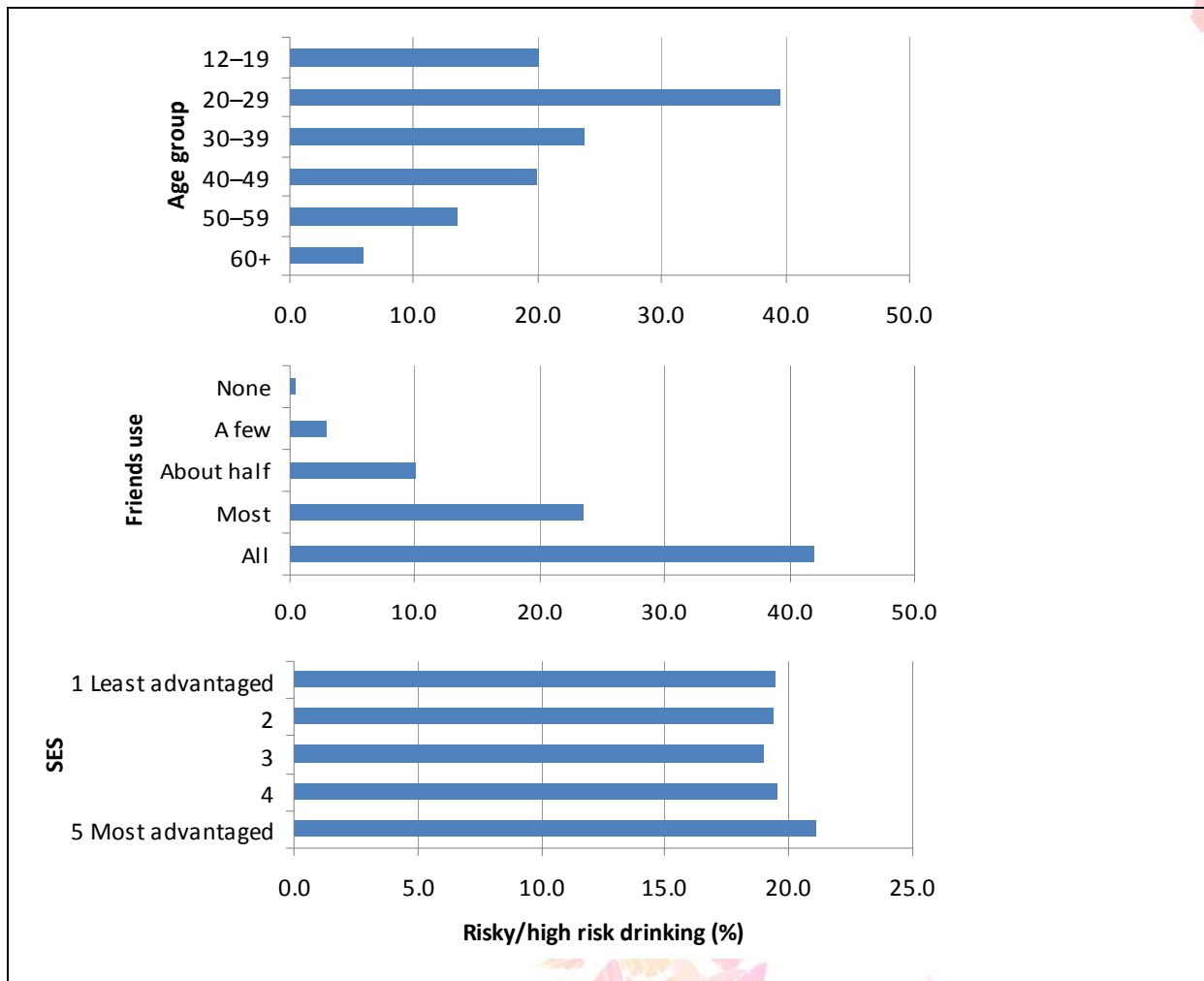
The survey obtained responses from more than 23,000 people, with an overall response rate of 49% (39% for CATI and 52% for drop and collect). The distribution of respondents by each survey mode is shown in Table 2. Note that CATI respondents as a proportion of all respondents in each region was consistently around 15%.

Table 2 Distribution of survey respondents in the 2007 NDSHS

Survey mode	ASGC Remoteness Area				Australia
	MC	IR	OR	R+VR	
	(Number)				
CATI	12,453	4,182	2,483	700	19,818
Drop and collect	2,244	679	457	130	3,510
Total	14,697	4,861	2,940	830	23,328

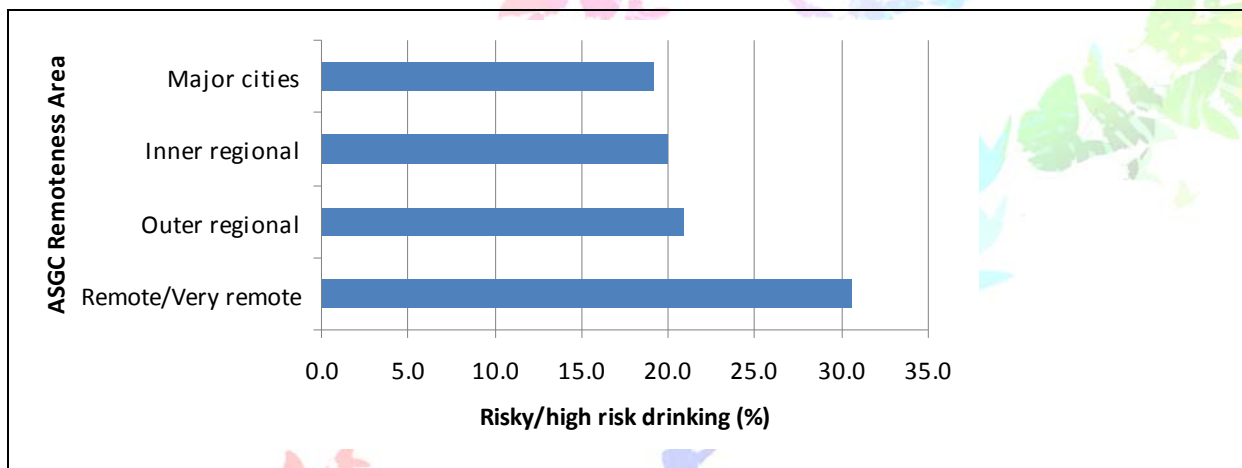
The prevalence of short-term risky alcohol consumption nationally was 19.7%. In most cases this varied considerably among the levels of each categorical variable. Some of these bivariate analyses are presented graphically below. The greatest differential was seen for 'Friends use', ranging from 0.5% risky/high risk consumption where no friends consumed alcohol, up to 42% for those who reported all friends consumed alcohol. Surprisingly, the prevalence of risky/high risk drinking did not vary in a systematic way across socio-economic status, as many other risk behaviours do.

Figure 2 Selected correlates of risky/high risk drinking, Australia



The prevalence of short-term risky alcohol consumption increased with increasing remoteness, from around 19% in major cities to 31% in remote/very remote areas (Figure 3). This pattern held for most levels of each of the selected categorical variables (see Annex table 1 for detailed results).

Figure 3 Risky/high risk drinking by ASGC Remoteness Area



As logistic regression does not accept missing values for any variables, the input dataset for the modelling analyses contained 20,623 cases. After application of the modified case weight (which scaled down the original case weight but retained their relativity within the file), an effective 12,136 cases were input to the models.

The first model we fitted—the so-called ‘complete’ model—included the 11 categorical variables plus the remoteness variable, with risk/high risk alcohol as the dependent variable. At the conclusion of the forward stepwise inclusion method, SES and Indigenous status were not retained in the regression equation. The model was able to correctly predict alcohol risk status for 82.3% of cases, and 27.9% of the risky/high risk cases. Table 3 shows key parameters for the level with the largest odds ratio within each variable. The most influential variable in this model was ‘Friends use’, with risky/high alcohol consumption being 92 times as likely among those who had all friends consume than among those who reported that no friends drink. Other influential variables were ‘Age group’ and ‘Smoker status’.

Table 3 Selected model parameters for the complete model

Variable	Level with largest odds ratio	Sig.	Exp() (Odds ratio) ^(a)	95% C.I. for EXP()	
				Lower	Upper
Sex	Male	.31	.000	1.36	1.22 1.51
Age group	20–29	1.48	.000	4.38	3.33 5.75
Employment status	Currently employed	.27	.035	1.30	1.02 1.67
Main language	Not English	-1.21	.000	.30	.22 .40
Marital status	Never married	.49	.000	1.64	1.41 1.90
Ease of access	Very easy	1.43	.019	4.19	1.27 13.87
Friends use	All	4.52	.000	91.72	24.64 341.37
Problem perception	Not alcohol	-.20	.033	.82	.68 .98
ASGC RA	Remote/Very remote	.45	.008	1.56	1.13 2.17
Smoker status	Smoker	1.00	.000	2.71	2.42 3.05
Constant	—	-7.95	.000	—	— —

(a) Compared with reference (indicator) level listed in Table 1.

Further models were then fitted selecting out cases corresponding with each level of the remoteness variable. The three most influential variables from the complete model also ranked as the top three most influential variables for each remoteness area model, as summarised in Table 4 (full details of each model are available on request). Indeed, for the Remote/Very remote model these were the only variables in the equation at the end of the stepwise inclusion process.

Table 4 Ranking of influence of included variables for each model

Variable	ASGC Remoteness Area				Australia
	MC	IR	OR	R+VR	
	(Ranking)				
Sex	7	4	4	—	5
Age group	2	3	3	2	2
Employment status	8	5	—	—	8
Main language	4	—	—	—	4
Socio-economic status	—	—	—	—	—
Marital status	5	—	—	—	7
Indigenous	—	—	—	—	—
Ease of access	6	—	—	—	6
Friends use	1	1	1	1	1
Problem perception	—	6	—	—	10
Smoker status	3	2	2	3	3
ASGC Remoteness Area	N/A	N/A	N/A	N/A	9

Note: The 'complete' model (that is, for Australia) is shown for comparison.

Each of the models were able to correctly predict the dependent variable outcome for around 80% of cases overall, and ranged from 18% to 55% of the risky/high risk cases (Table 5).

Table 5 Correctly classified (predicted) cases for each model

Dependent variable outcome	ASGC Remoteness Area				Australia
	MC	IR	OR	R+VR	
	(% Correct cases predicted)				
Low risk/abstainer	96.0	96.9	97.1	88.5	96.0
Risky/high risk	30.2	21.0	18.0	54.7	27.9
Total	83.1	81.3	80.5	78.3	82.3

Discussion

The most important variable in predicting risky drinking across all five models was the proportion of friends and acquaintances that also drink. This, along with age group and smoking status being influential in each model, suggests the importance of socio-cultural environments in directing drinking behaviours. Although not borne out by the regression modelling, greater availability in remote areas (44% reported access to alcohol was fairly or very easy, compared with 29% nationally) may also be a factor in increased risky/high risk drinking.

As noted in the current *National Alcohol Strategy* document, "Australia's drinking cultures are driven by a mix of powerful, intangible social forces—such as habits, customs, images and norms, and other interlocking and equally powerful tangible forces relating to the social, economic and physical availability of alcohol—such as promotion and marketing, age restrictions, price, outlets, hours of access and service practices".¹⁰

The National Preventative Health Taskforce discussion paper proposes priority policy options,³ largely consistent with the directions in the *National Alcohol Strategy*. Some of these that would appear to be particularly pertinent in remote areas are:

- managing both the physical availability (access) and economic availability (price)—attending to such things as outlet opening hours, density of alcohol outlets and discounting of alcohol products
- addressing the cultural place of alcohol
- improving enforcement of current legislative and regulatory measures (such as Responsible Serving of Alcohol or bans on serving intoxicated persons and minors, or continuing to lower the blood alcohol content in drink-driving laws).

There are several limitations in this analysis:

- the models are not exhaustive (that is, do not use all the variables available)
- data are self-reported, and are therefore likely to produce under-estimates of risky/high risk alcohol consumption
- the results are based on point-in-time data, such that the dynamic aspect of contributing factors is not adequately captured
- the survey does not include other important predictors of drug use (including other social determinants of risk behaviours, such as early childhood experiences).

Notwithstanding these limitations, the analysis confirms earlier findings regarding correlates of risky alcohol consumption, and adds to the evidence base regarding the utility of various policy responses.

Conclusion

We have described, through various analytical techniques, the correlates of risky alcohol consumption and their distribution across regional and remote Australia. We believe that this offers some clues as to better targeted, and therefore more effective, risk prevention interventions.

In particular, the results presented here suggest that the policy options currently being considered by the National Preventative Health Taskforce—with a focus on addressing the cultural place of alcohol—would be highly relevant for reducing the harms associated with risky alcohol consumption in regional and remote Australia.

References

1. Begg S, Vos T, Barker B, Stevenson C, Stanley L & Lopez AD. *The burden of disease and injury in Australia 2003*. Canberra: AIHW, 2007.
2. Collins DJ & Lapsley HM. *The costs of tobacco, alcohol and illicit drug abuse to Australian society in 2004/05*. National Drug Strategy monograph series no. 64. Canberra: Department of Health and Ageing, 2008.
3. Alcohol Working Group (National Preventative Health Taskforce). *Preventing alcohol-related harm in Australia: a window of opportunity*. Technical report no. 3. Canberra: National Preventative Health Taskforce, 2008.
4. Council of Australian Governments. *COAG communiqué 2 October*. Canberra: COAG, 2008, <www.coag.gov.au/coag_meeting_outcomes/2008-10-02/index.cfm>, accessed 6 February 2009.

5. Australian Institute of Health and Welfare (AIHW). 2007 National Drug Strategy Household Survey: detailed findings. Drug statistics series no. 22. Canberra: AIHW, 2008.
6. Australian Institute of Health and Welfare. Rural, regional and remote health: indicators of health system performance. Rural health series no. 10. Canberra: AIHW, 2008, <www.aihw.gov.au/publications/index.cfm/title/10521>, accessed 6 February 2009.
7. Australian Institute of Health and Welfare. 2007 National Drug Strategy Household Survey: first results. Drug statistics series no. 20. Canberra: AIHW, 2008.
8. Australian Bureau of Statistics (ABS). ASGC remoteness classification: purpose and use. Census paper no. 03/01. Canberra: ABS, 2003, <[www.abs.gov.au/websitedbs/D3110122.NSF/0/f9c96fb635cce780ca256d420005dc02/\\$FILE/Remoteness_Paper_text_final.pdf](http://www.abs.gov.au/websitedbs/D3110122.NSF/0/f9c96fb635cce780ca256d420005dc02/$FILE/Remoteness_Paper_text_final.pdf)>, accessed 6 February 2009.
9. National Health and Medical Research Council (NHMRC). Australian alcohol guidelines: health risks and benefits. Canberra: NHMRC, 2001.
10. Ministerial Council on Drug Strategy (MCDS). National Alcohol Strategy 2006–2009. Canberra: MCDS, 2006.

Annex table 1 Risky/high risk alcohol consumption by region and selected characteristics

Characteristic	Region					Australia
	MC	IR	OR	R+VR	(Per cent)	
All people	19.2	20.0	20.9	30.6	19.7	
Sex	Males	21.8	24.3	25.5	33.8	22.9
	Females	16.6	16.1	16.1	27.3	16.7
Age	12–19	20.1	20.1	18.9	23.8	20.0
	20–29	38.7	39.8	41.4	66.7	39.6
	30–39	21.3	28.9	27.8	38.2	23.8
	40–49	18.3	20.7	25.8	27.7	19.8
	50–59	12.7	14.9	15.1	15.0	13.5
	60+	5.9	5.9	6.4	5.3	5.9
Employment	Currently employed	24.5	27.0	28.2	36.7	25.6
	Student	22.5	21.6	19.5	25.3	17.0
	Unemployed	26.8	34.8	29.5	30.8	29.0
	Retired or on a pension	6.3	8.3	7.6	10.3	7.0
Language	English	20.8	20.3	20.8	29.7	20.9
	Other	6.1	1.5	4.7	1.9	5.9
SES	1 Least advantaged	18.6	19.2	13.3	23.9	19.5
	2	17.6	21.1	20.0	33.6	19.4
	3	18.9	19.6	17.9	20.9	18.9
	4	18.3	18.2	22.0	22.6	19.5
	5 Most advantaged	20.9	22.6	20.2	34.8	21.1
Marital status	Currently married	14.7	18.7	18.1	25.9	16.2
	Never married	29.9	26.9	28.9	39.6	29.4
	Separated ^(a)	13.5	13.2	17.5	25.4	14.0
Indigenous status	Indigenous	26.4	25.3	22.9	19.1	24.3
	Not Indigenous	19.0	19.8	20.6	30.5	19.5
Ease of access	Probably impossible	2.2	3.9	—	4.7	2.4
	Very difficult	2.0	9.7	—	15.1	3.6
	Fairly difficult	2.2	0.0	4.4	1.2	1.9
	Fairly easy	5.3	6.4	13.2	13.9	6.5
	Very easy	22.1	22.7	23.4	35.0	22.6
Friends use	All	41.7	40.8	41.2	58.8	41.9
	Most	22.3	24.9	26.2	30.7	23.4
	About half	9.0	10.7	14.0	17.9	10.1
	A few	2.4	4.0	3.0	4.5	2.9
	None	0.3	1.2	0.5	1.4	0.5
Problem ^(b)	Alcohol	16.5	13.9	13.9	24.4	15.7
	Not alcohol	19.9	21.1	21.9	32.1	20.6
Smoking status	Smoker	38.7	36.4	38.0	51.6	38.4
	Non-smoker	15.1	15.6	16.0	24.5	15.4

(a) Includes separated, divorced or widowed.

(b) Response to the question 'When people talk about "a drug problem", which drug do you first think of?'

Presenter

Mark Cooper-Stanbury has held research and executive positions at the Australian Institute of Health and Welfare since 1993. He has prepared or contributed to around 50 publications for the Institute, the Australian Bureau of Statistics, the Steering Committee for the Review of Government Service Provision, and the Department of Health and Ageing. He has also co-authored a number of articles in peer-reviewed journals, and has made numerous presentations at national and international conferences, symposia and workshops.