

How is alcohol expenditure distributed in Australia?

Exploring alcohol expenditure and experience of financial difficulties

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For over a decade, FARE has been working with communities, governments, health professionals and police across the country to stop alcohol harms by supporting world-leading research, raising public awareness and advocating for changes to alcohol policy. In that time FARE has helped more than 750 communities and organisations, and backed over 1,400 projects around Australia.

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CAPR not only contributes to policy discussions in Australia but also contributes to international studies of significance for the World Health Organization. An example of its international work is its part in the [GENACIS project](#), which examines gender alcohol and culture in more than 40 countries. The Centre has also undertaken a pioneering study, [The range and magnitude of alcohol's harm to others](#) - taking account of alcohol-related harms on people other than the drinker, otherwise referred to as third party harms. Results from the study were also included in the World Health Organization's [Global Status Report on Alcohol and Health 2011](#), and WHO is using the study as a model for such studies globally.

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Summary

There has been increasing concern about the harm to health and society caused by alcohol. However the relationship between alcohol and financial inequalities and poverty has not previously been explored. This is the first study in Australia to examine household expenditure on alcohol in relation to financial and demographic factors, residential situation, and financial difficulty. The study uses secondary data from the 2009-10 Australian Household Expenditure Surveys (HES) to investigate the distribution of household spending on alcohol, and the links between alcohol expenditure and the financial difficulties experienced by households. Furthermore, it examines the determinants of alcohol expenditure in order to better inform policies for controlling alcohol consumption and related harms through measures which impact on this behaviour.

The analysis found that Australian households spent an average of \$32.20 per week on alcohol, which is equivalent to 1.9 per cent of their total weekly household expenditure. This is higher than average expenditure on tobacco (\$12.50), personal care (\$24) and education (\$30.60), and similar to the amount Australian households spent per week on fuel and power (\$32.50). The distribution of alcohol expenditure was fairly even across all income groups, with households in the third income quintile (the middle group) spending the highest proportion (2.3 per cent) of their total household expenditure on alcohol.

Australian households spent more on off-licence purchases (alcohol sold at takeaway liquor barns or bottle shops) than for on-licence purchases (alcohol consumed at licensed venues such as pubs, clubs and bars). This study found that households who purchased alcohol spent an average of \$15 and \$26 each week on alcohol beverages at on- and off-licence premises respectively. Interestingly, the lower income households spent proportionally higher amounts (70 per cent) at off-licensed premises rather than at on-licensed premises, when compared with the households in the higher income quintiles (58 per cent). The ratio of average alcohol spending by households at off- and on-licence premises is 1.7, but the ratio reaches 2.3 in the lowest income quintile group, and on the other hand is 1.4 in the highest income quintile.

A positive association was found between the percentage of household expenditure on alcohol and the financial difficulties which were experienced by households. Households that spent a greater proportion of their total expenditure on alcohol (the third, fourth and highest quintiles of this analysis) were 1.3 to 1.7 times more likely to experience financial difficulties than households which had no spending on alcohol. Furthermore, reporting having experienced three or more types of financial difficulties in the last 12 months was related to higher levels of alcohol expenditure.

Households who are renting and are headed by 18-24 year olds also spent significantly more money on alcohol each week, and were more likely to experience financial difficulties. When comparing expenditure among lower income groups, across Australian states and territories, the Northern Territory was found to have both the highest average weekly spend on alcohol (\$55) and the highest rates of reported financial difficulties compared with other states and territories. When compared to 12 other countries for which similar data were identified, Australia ranked seventh for alcohol expenditure as a percentage of total household expenditure, but in the top five in alcohol consumption per capita.

A decrease in the alcohol spending in a household would effectively help to reduce the household's financial problems, although further research is needed to explore this relationship. Policies which target household alcohol expenditure, for instance by restricting the availability of alcohol and raising alcohol prices and taxes, may help to reduce financial hardship for some Australian households, particularly among families experiencing financial difficulties and among young people and renters.

Introduction

Alcohol use and alcohol-related problems have attracted a great deal of attention in Australia in recent decades. Alcohol contributes to over 5,500 deaths and 157,132 hospitalisations each year in Australia (Gao et al., 2014). In addition to these health impacts, there is longstanding interest in the social and economic impacts of alcohol consumption, with an increasing focus on how alcohol relates to financial inequalities and poverty (Casswell & Thamarangsi, 2009; Khan et al., 2002). A number of studies have found that disadvantaged groups are less likely to report alcohol use, but their proportional expenditure on alcohol is higher than the proportion for wealthier groups (Jankhotkaew et al., 2012). A positive link was found by Khan et al. (2002), with the authors highlighting the association between poverty and alcohol consumption.

A recent study in Thailand found that households spent more money on alcohol and tobacco than expenditure on healthcare, education, personal services, and recreation (Jankhotkaew et al., 2012). A study conducted by Pu et al. (2008) in Taiwan indicated that spending on alcohol competes with the necessary spending on other goods and services such as food, clothes and footwear, utilities and education, and that these effects were particularly found in lower-income groups. In a poor family, a large amount of income used for alcohol means less money available for food, health, and education. Thus, a high alcohol expenditure is one of the significant factors which puts poor households at high risk of falling into a poverty trap (Giang et al., 2013). Moreover, there is some evidence that males with financial problems are more likely to binge drink compared with males who do not have financial problems (Pinhey et al., 1997).

There has been little research using alcohol expenditure data in Australia, and there are no previous studies on whether income and wealth gradients are related to alcohol expenditure among households in Australia. Although the causal effects of alcohol spending on health, poverty and other socio-economic indicators have been widely discussed by previous studies (see Jankhotkaew et al., 2012; Giang et al., 2013; and Pinhey et al., 1997), the determinants or influencing factors that could affect expenditure on alcohol have remained unclear. In particular, there are few studies on how age, income and other demographic factors affect alcohol expenditure and whether the experience of financial difficulties is related to alcohol expenditure.

The Australian Bureau of Statistics Household Expenditure Survey 2009-10 (HES) is a useful data resource that has not been previously analysed to determine alcohol as an economic commodity in Australian households. This study firstly uses the HES data to explore the distribution of alcohol expenditure in Australia by different income quintiles, by states and territories, and across on- and off-licence venues. Secondly, an international comparative analysis is conducted to compare the alcohol expenditure in Australia to other countries, in order to assess how Australian expenditure fits into the global picture. Third, the relationship between alcohol expenditure and the experience of financial difficulties is examined. Understanding such a relationship could help to provide policy suggestions for reducing alcohol-related financial problems. And finally, the determinants of alcohol expenditure are examined in order to facilitate policy formulation for reducing alcohol consumption and related harms in Australia.

Methods

Data

This study utilises secondary data from the HES to investigate the distribution of household expenditure on alcohol in Australia. The HES collected information on the expenditure, income, net worth and other characteristics of 9,774 households in private dwellings throughout Australia during 2009 and 2010. Full details of the methods, the questionnaire and the broad findings of the HES are available in the main survey report (ABS, 2011a).

This study further examines the HES in order to determine the following:

1. How is alcohol expenditure distributed across different gross household income quintiles in Australia?
2. How does alcohol expenditure vary across Australian states and territories?
3. How does alcohol expenditure in Australia differ from that in other countries?
4. What are the relationships between alcohol expenditure and the experience of financial difficulties in Australian households?
5. What are the determinants of alcohol expenditure in Australia?

In order to address these research questions, a number of key variables were used in the study, including weekly household expenditure, weekly household gross income, financial difficulty indicators, age of the household reference person, housing tenure type and so on. The key variables used in this analysis are outlined and explained in the following table.

Table 1. List and explanation of key variables used in the analysis

Key variables	Explanation of the variables
Weekly household expenditure	Weekly household expenditure is the weekly estimates of household expenditure on goods and services and selected other payments, including income tax, mortgage, superannuation, life insurance, other capital housing costs, and expenditure in-kind (ABS, 2011b). Household expenditure on goods and services covers expenditure on 14 items (for example, current housing costs, food and non-alcoholic beverages, alcoholic beverages, tobacco products, transport, recreation, and so on). Expenditure on education was also used in our analysis.
Weekly household gross income	Household gross income is the sum of the income from all sources, whether monetary or in-kind, before income tax, the Medicare levy and the Medicare levy surcharge are deducted (ABS, 2011b). In the analysis, the household gross income was split into five quintiles from the lowest income quintile to the highest income quintile.
Indicators of financial difficulties	The indicators relating to financial difficulties examined problems of cash flow and financial resources.

	<p>The nine specific financial difficulty indicators were:</p> <ol style="list-style-type: none"> 1. Could not raise \$2,000 within a week for emergency. 2. Spent more money than earned. 3. Could not pay electricity, gas or telephone bills on time. 4. Could not pay car registration or insurance on time. 5. Pawned or sold something due to shortage of money. 6. Went without meals. 7. Was unable to heat home. 8. Sought assistance from welfare/community organisations. 9. Sought financial help from friends or family. <p>Respondents were asked if their household had experienced each of these nine financial difficulties in the last 12 months. Analysis here is initially in terms of whether the household experienced at least one of these difficulties, and follow-up analyses are based on a threshold of two or more.</p>
Age of household reference person	While the survey is based on household expenditure, a household reference person is chosen for key demographic variables. The household reference person is selected through a set of operating procedures designed to identify the person most likely to be representative of the household or income unit. This approach is elaborated in the HES User Guide (ABS, 2011b).
The percentage of household expenditure on alcohol quintiles	The percentage of household expenditure on alcohol was divided into five quintiles, to analyse how changes in the percentage of alcohol expenditure could affect the experience of financial difficulties reported by households.
Housing tenure type	Housing tenure type indicates the type of tenure for the household in the last 12 months. Tenure categories include: renter, owner without a mortgage, owner with a mortgage, and other tenure types.
Number of males in household	Number of males in the household was included as a factor in the regression models because, on average, males consumed substantially more alcohol than females in Australia (ABS, 2011c).

In order to understand how Australian alcohol expenditure compares internationally, the percentage of total expenditure attributed to alcohol and per capita alcohol consumption were collected for 11 other countries: Croatia, Denmark, Finland, Iceland, Ireland, Norway, Singapore, Sweden, Thailand, the United Kingdom (UK) and the United States (US).

US data was obtained from the US Consumer Expenditure Survey (CE) 2012 (US Bureau of Labor Statistics, 2011). UK data was abstracted from the UK Expenditure and Food Survey 2012 (UK Office for National Statistics, 2011). Singapore data was abstracted from the Singapore Household Expenditure Survey 2007-08 (Department of Statistics Singapore, 2011). Thailand data was abstracted

from the Thai Household Socio-Economic Survey 2012 (National Statistical Office of Thailand, 2011). Data for the remaining countries were obtained from the World Health Organization (WHO) Global Health Observatory Data Repository (2013) online, using the most up-to-date data from 2006 to 2008.

Per capita alcohol consumption data for each of these 12 countries, Australia and the 11 international comparisons selected for this analysis, were all 2008 data and taken from the Organisation for Economic Co-operation and Development (OECD) health database (2013) and the WHO Global Health Observatory Data Repository (2013) online.

Analysis

Simple descriptive analyses were conducted initially, using cross-tabulations and means on the weighted survey data to examine alcohol expenditure compared to other goods and services, and over different income quintiles and demographic groups. The international comparative analysis was presented in graphic format, comparing Australian alcohol expenditure and consumption with the other 11 countries.

The analyses of alcohol expenditure and financial difficulties were undertaken in two stages. First, simple descriptive analyses were employed to investigate the association between alcohol expenditure and financial difficulties at different levels of household income among the six states and two territories in Australia. Second, logistic regression models were developed to estimate the link between alcohol expenditure and the financial difficulties experienced by households while controlling for the effects of other key factors, such as household income, age, number of dependents under 15 years old, and housing tenure type.

Similar analyses were used to examine the potential determinants of the amount and proportion of household expenditure on alcohol. Both bivariate and multivariate linear regression models were employed in the determinants analysis. The proportion of household expenditure on alcohol was multiplied by 100 to keep it on a similar scale to other key factors in the models.

Results

Alcohol expenditure in Australia

Household expenditures on alcohol and other goods and services

In Australia, alcohol contributes a significant amount to total household expenditure. During 2009 and 2010, the average alcohol expenditure was \$32.30 (AUD) per week, which is higher than expenditures on tobacco (\$12.50), personal care (\$24) and education (\$30.60), and similar to expenditure on fuel and power combined (\$32.50), as shown in Table 2.

Average weekly alcohol spending as a percentage of total household expenditure over five gross income quintiles is presented in Table 3.

It is noted that households from the lowest and second income quintiles spent an average of \$9.50 and \$12.80 on alcohol per week, which is less than the expenditures on nearly all goods and services except tobacco. In contrast, households from the third and fourth income quintiles spent more on alcohol than on tobacco, personal care and education. Households in the third income group spent the highest proportion (2.3 per cent) of their total weekly expenditure on alcohol compared with other income groups. Although households in the highest income group spent the smallest per cent of their expenditure on alcohol (1.6 per cent), they spent the highest amount of money (\$55 AUD weekly).

Table 2. Average weekly total household expenditure (\$ AUD) on goods and services over gross income quintiles

	Gross income quintiles					All households
	Lowest	Second	Third	Fourth	Highest	
Alcoholic beverages	9.50	12.80	22.20	32.80	55.00	\$32.30
Current housing costs	117.30	117.70	173.50	241.60	321.10	\$223.10
Domestic fuel and power	21.10	24.90	28.30	33.50	41.90	\$32.50
Food and non-alcoholic beverages	92.20	123.30	154.50	210.70	305.30	\$203.90
Tobacco products	7.90	8.80	13.90	15.70	12.10	\$12.50
Clothing and footwear	13.30	19.80	27.50	42.50	78.70	\$44.30
Household furnishings and equipment	24.00	33.70	38.30	53.40	100.00	\$58.60
Household services and operation	36.10	40.50	51.10	64.80	105.30	\$68.00
Medical care and health expenses	37.50	39.70	55.00	60.60	98.30	\$65.60
Transport	59.30	83.60	123.50	189.90	335.10	\$192.60
Recreation	55.40	84.80	106.60	163.70	266.50	\$161.40
Personal care	9.90	13.20	16.50	23.60	39.10	\$24.00
Education	9.90	13.70	18.20	29.70	56.10	\$30.60
Miscellaneous goods and services	32.50	41.20	69.50	116.20	210.00	\$116.60
Expenditure on goods and services	515.80	644.10	880.40	1,248.70	1,968.4	\$1,235.40
Total household expenditure	\$612.20	\$687.30	\$1,004.10	\$1,618.30	\$3,111.50	\$1,719.10

Expenditures on goods and services as a percentage of total household expenditure varies across different gross income quintile groups. Households from the highest income quintile spent the smallest proportion of total expenditure on goods and services (56.5 per cent), while they spent a higher percentage of total expenditure on other payments (such as mortgage payments and superannuation) compared with households from other income quintiles (43.5 per cent). Also, this difference reveals that people with lower incomes spend a greater proportion of their income on necessities (such as housing costs), while higher income households spend a greater proportion of their total expenditure on goods and services. Alcohol spending is among a few goods and services

which fall between, with the highest proportion in the middle quintiles (like recreation, tobacco and household furnishings).

Table 3. Proportion of total household expenditure on alcohol and other goods and services over gross income quintiles

	Gross income quintiles					All households
	Lowest	Second	Third	Fourth	Highest	
Alcoholic beverages	1.7%	1.9%	2.3%	2.2%	1.6%	1.9%
Current housing costs	22.5%	19.0%	18.9%	16.8%	7.6%	15.2%
Domestic fuel and power	2.7%	2.6%	2.5%	2.4%	1.4%	1.9%
Food and non-alcoholic beverages	16.5%	19.8%	18.3%	14.0%	9.3%	14.4%
Tobacco products	1.5%	1.5%	2.3%	1.2%	0.5%	1.3%
Clothing and footwear	2.0%	2.7%	3.0%	2.4%	2.1%	2.4%
Household furnishings and equipment	2.6%	3.6%	3.5%	2.4%	2.4%	2.8%
Household services and operation	6.5%	6.6%	5.5%	4.2%	3.2%	4.7%
Medical care and health expenses	3.7%	5.6%	5.0%	3.6%	3.1%	4.0%
Transport	6.9%	10.8%	11.6%	12.4%	10.0%	10.7%
Recreation	6.4%	10.9%	12.4%	10.5%	8.1%	9.8%
Personal care	1.6%	1.8%	1.6%	1.2%	1.2%	1.4%
Education	1.6%	2.0%	1.8%	1.8%	1.8%	1.8%
Miscellaneous goods and services	3.1%	4.5%	6.0%	6.0%	6.2%	5.5%
Expenditure on goods and services	81.1%	93.3%	93.9%	78.9%	56.5%	76.9%
Total household expenditure	100%	100%	100%	100%	100%	100%

The distribution of percentage of household expenditure on alcohol by gross household weekly income level is presented in Figure 1, which suggests the distribution is very skewed. The figure shows some households with gross income less than \$1,000 a week spent a very high proportion of total expenditure on alcohol, while the households with higher weekly earnings spent smaller percentages of their total expenditure on alcohol. As the weekly household income for the third income quintile was in a range of \$640 and \$1,102, it can be observed from Figure 1 that alcohol expenditure in this group is more varied than in other income quintile groups.

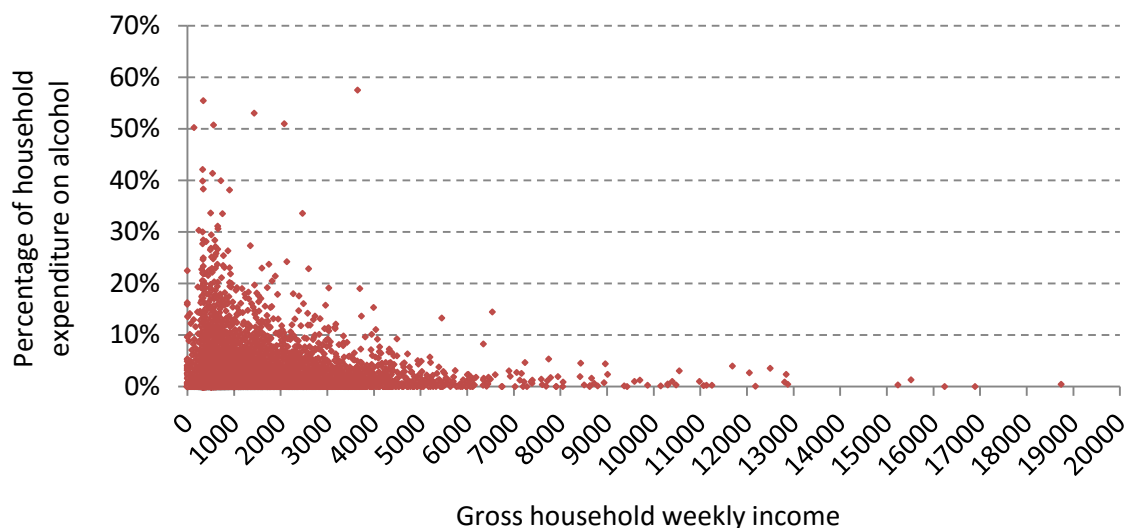


Figure 1. Scatter chart of percentage of total household expenditure on alcohol and gross weekly household income

Alcohol expenditure at on- and off-licence premises

Household alcohol expenditures at off-licence premises (alcohol sold at takeaway liquor barns or bottle shops) and on-licence premises (alcohol consumed at licensed venues such as pubs, clubs and bars) for different income quintiles are shown in Figure 2. Australian households spent an average of \$26 each week on alcoholic beverages at off-licence premises, while they spent an average of \$15 on alcohol at on-licence premises.

Households in the lowest, second and third income groups spent more than twice as much money each week on alcohol at off-licence premises as at on-licence premises (for instance, alcohol expenditure was \$14 and \$6 per week at off- and on-licence premises respectively in the lowest income group). In contrast, households in the highest income groups spent 1.4 times as much at off-licence premises (\$34) as at on-licence premises (\$25).

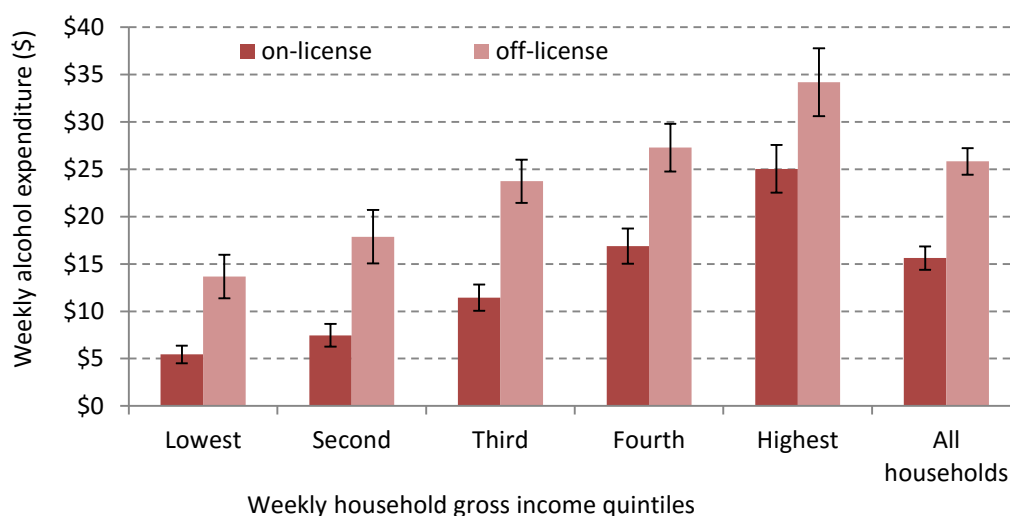


Figure 2. Household expenditure on alcohol at on- and off-licence premises among gross income quintiles¹

Distribution of alcohol expenditure in Australian states and territories

The average weekly alcohol expenditure and the average percentage of total household alcohol expenditure are shown in Figure 3 by state and territory. On average, households in New South Wales (NSW), Victoria and Queensland spent approximately \$30 a week on alcohol beverages. Households in South Australia (SA) and Tasmania spent smaller amounts than other states and territories, about \$25 a week. Households in Western Australia (WA) and the Australian Capital Territory (ACT) spent nearly \$40 a week on alcohol. In the Northern Territory (NT), the average weekly household expenditure on alcohol was the highest (over \$50). Figure 3 shows that households in NT spent a higher proportion of their total expenditure on alcohol than households in other states and territories (3.14 per cent of total weekly household expenditure). The households in the ACT spent the smallest proportion of weekly expenditure on alcohol (1.5 per cent).

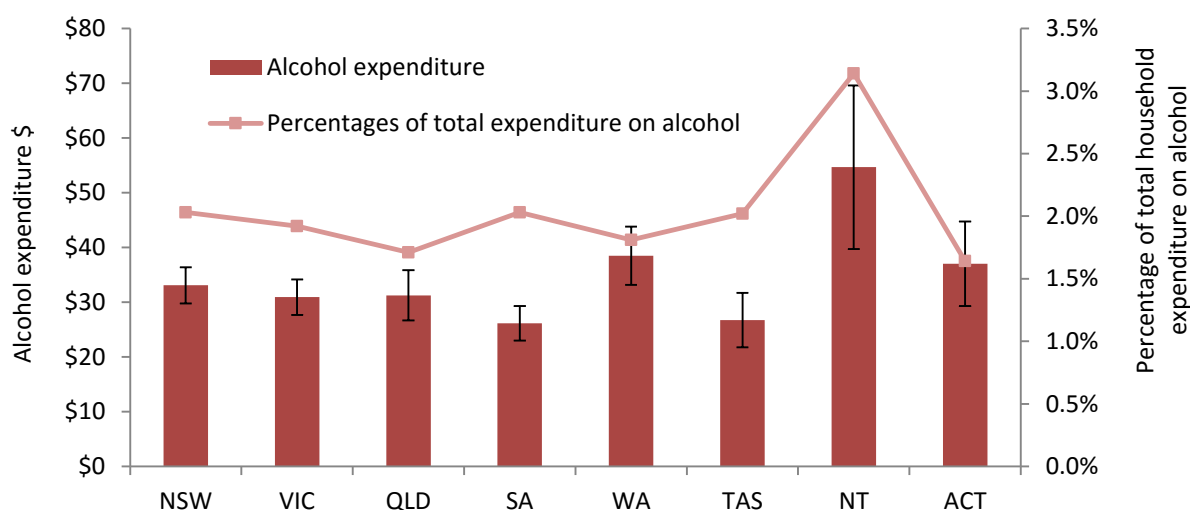


Figure 3. The average alcohol expenditure in Australian states and territories

The comparison of alcohol expenditure in Australia with expenditure in other countries

A comparison of alcohol expenditure as a percentage of total household expenditure and aggregate level alcohol consumption in Australia and other countries is presented in Figure 4. The data shows that the percentage of total household expenditure on alcohol in Australia (nearly two per cent) was higher than in Croatia, Denmark, Singapore, the UK and US, while it was lower than in Finland, Iceland, Ireland, Norway, Sweden and Thailand. The figure also indicates that per capita alcohol consumption (15 years plus) in Australia in 2008 was around ten litres, which was similar to Denmark, Finland and the UK, but it was higher than in Ireland, Norway, Singapore, Sweden and the US.

In terms of alcohol's percentage of household expenditure, Australia is ranked number seven out of the 12 countries analysed. However when examining alcohol consumption per capita it is ranked fifth.

¹ One hundred and twenty four (out of 9,774) households reported purchasing or consuming alcohol at an undefined place. 95 per cent confidence interval error bars are also shown in the chart.

Furthermore, in comparison to three other developed countries (Iceland, Norway and Sweden), Australia has a smaller percentage of total household expenditure on alcohol, but it has a much higher alcohol consumption per capita.

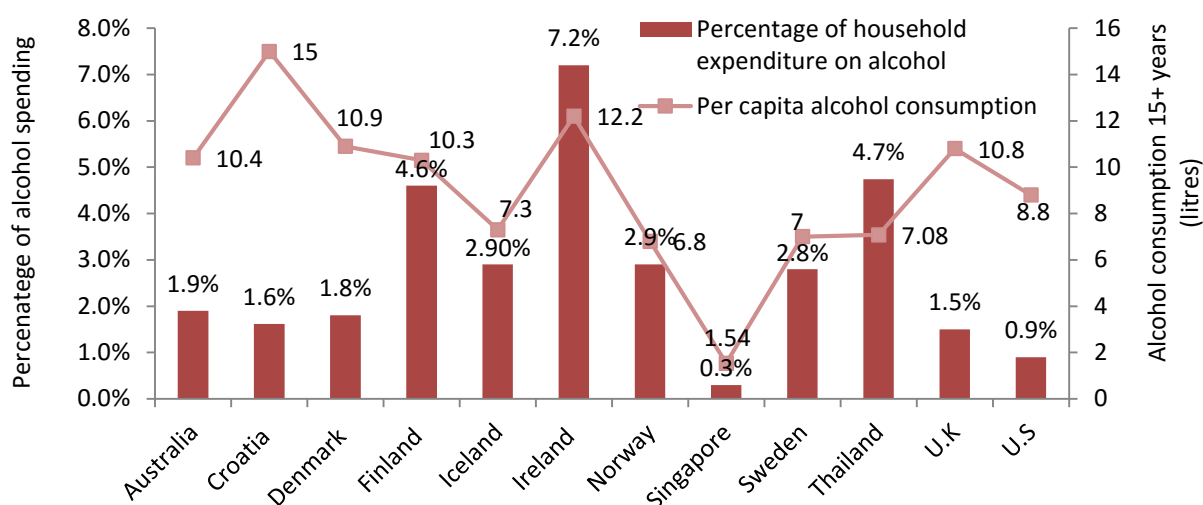


Figure 4. International comparison of alcohol expenditure as a percent of total household expenditure and per capita alcohol consumption among 12 countries

Further international comparisons were undertaken comparing the distribution of alcohol expenditure over income quintile groups for the five countries for which data were available (Table 4). In Australia, households in the third income group spent the highest proportion (2.3 per cent) of total weekly expenditure on alcohol compared with other income groups. In the US, the higher household income groups spent a higher percentage of expenditure on alcohol than other income quintiles. In contrast, the lowest income groups spent the highest proportion of total household expenditure on alcohol (6.7 per cent) in Thailand. Overall, the UK's percentages of household expenditure on alcohol were the most similar to Australia's. The percentage of household expenditure on alcohol was very small in Singapore and consistent (0.3 per cent) across all five income groups.

Table 4. Comparison of percentage of household expenditure on alcohol across income quintiles in 5 countries

Countries	Gross household income quintiles					All households
	Lowest	Second	Third	Fourth	Highest	
Australia	1.67%	1.90%	2.30%	2.16%	1.57%	1.92%
United States (US)	0.77%	0.83%	0.76%	0.92%	1.05%	0.92%
United Kingdom (UK)	1.54%	1.44%	1.57%	1.57%	1.45%	1.51%
Singapore	0.30%	0.20%	0.30%	0.30%	0.30%	0.30%
Thailand	6.68%	5.09%	4.46%	3.93%	3.56%	4.74%

Alcohol expenditure and financial difficulties

Households were considered to have experienced financial difficulties if they reported any of the nine items outlined in Table 1. Table 5 presents the proportion of households reporting financial difficulties in the last 12 months by state and household income quintile. The data suggests that households from the lowest and second income groups were more likely to experience financial difficulties than households in higher income groups. This was particularly marked in Tasmania and the NT, where approximately 70 per cent of households in the lowest income group reported financial difficulties.

Table 5. Experience of financial difficulties in the last 12 months among Australian states and territories over different income quintiles

States and territories	Gross household income quintile					All households
	Lowest	Second	Third	Fourth	Highest	
NSW	61.8%	55.8%	55.0%	46.1%	30.3%	46.0%
VIC	56.1%	54.3%	58.3%	43.9%	26.8%	44.5%
QLD	56.7%	59.4%	59.4%	47.2%	30.5%	47.3%
SA	62.8%	63.5%	50.7%	48.6%	26.2%	47.5%
WA	61.6%	59.2%	46.3%	46.0%	31.1%	44.0%
TAS	70.4%	64.4%	58.4%	46.6%	21.8%	42.7%
NT	69.8%	76.5%	45.4%	45.9%	28.4%	50.8%
ACT	63.2%	61.2%	46.9%	36.0%	15.7%	29.5%

Crosstabulations explore the association at the state and territory level between alcohol expenditure and experience of financial difficulties in disadvantaged households. Figure 5 shows the association between expenditure on alcohol and household's experience of financial difficulties in the lower income groups (combining the lowest and second income quintiles) across six states and two territories in Australia. There is a positive association between the proportion of alcohol spending and proportion of lower-income households experiencing financial difficulties. In the NT, a higher proportion of the households reported experiencing financial difficulties than in other jurisdictions, and this is associated with a higher percentage of alcohol spending in the total household expenditure than other states and territories. In contrast, the households in Queensland and Victoria were less likely to report experiencing financial difficulties and spent smaller percentages of total expenditure on alcohol than other states and territories. No positive or negative association was observed between alcohol expenditure and financial difficulties in the mid and high income groups (thus, the figures were not presented here).

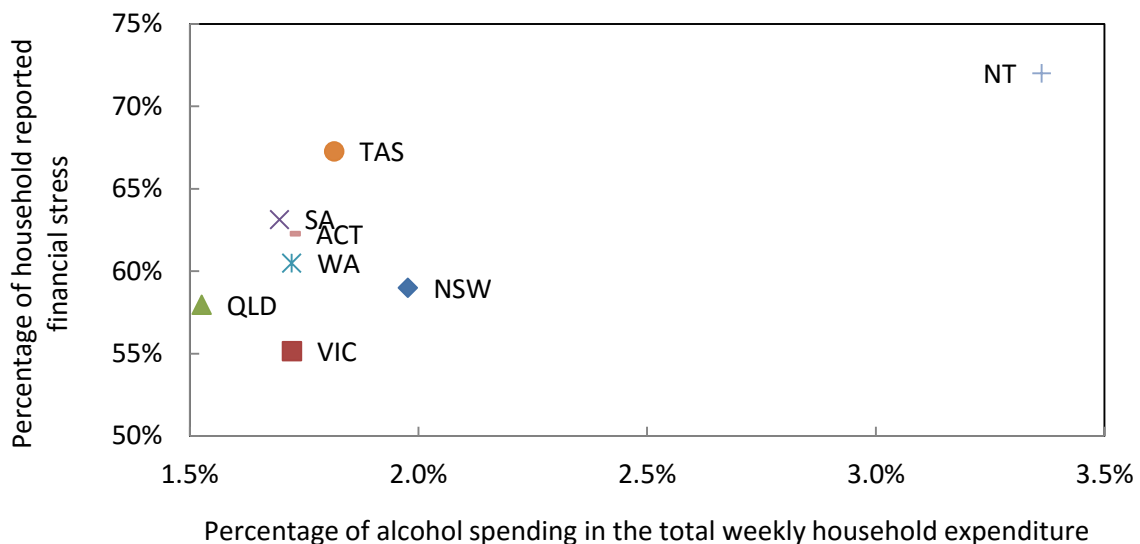


Figure 5. Cross-tabular analysis of financial difficulties and alcohol expenditure in the lower income groups (lowest and second income quintiles) across six states and two territories

Logistic regression analyses were employed to further investigate how the different levels of alcohol spending were associated with the prevalence of financial difficulties. The results of the logistic analyses are presented in Table 6. Some initial factors, such as number of income earners and household family type, were found to have no significant impact on the prevalence of financial difficulties and were excluded in the final logistic regression models. The bivariate models suggest that the age of the household's reference person, the quintiles of the proportion of household expenditure on alcohol, total household income, and the number of dependents under 15 years in the household were all significantly associated with the experience of financial difficulties. Households in higher age groups (compared with 18-24 year olds) were less likely to report financial difficulties. The households which spent higher percentages of their total expenditure on alcohol (third, fourth and highest quintiles) were about 1.3 to 1.7 times more likely to experience financial difficulties than households which had no spending on alcohol.

The households from the third, fourth and highest income quintile groups were less likely to report they had financial difficulties in the last 12 months compared with the lowest income group. The results of bivariate analyses (model one) indicate that households with more dependent children were more likely to have financial difficulties, as were households in rented dwellings. The results of multivariate models were similar to the bivariate analyses. The results in multivariate model three suggest that the reference age of the household, household income, number of dependents under 15 in the household and housing tenure type are the key predictors of financial difficulties. In this fully controlled model, alcohol expenditure was not significantly associated with financial difficulties.

We conducted further analyses using a stricter definition of financial difficulties (experienced at least two of the nine items from Table 1). Another three logistic regression models (models four, five and six) were established to predict the experience of two or more financial difficulties for the households. The results of the three new logistic regressions are consistent with the results for one or more financial difficulties (models one, two, and three).

Table 6. Logistic regression for predicting experience of financial difficulties

N=9774	Prevalence of financial difficulties			Experienced 2 or more types of financial difficulties		
	Bivariate (1)	Multiv. (2)	Multiv. (3)	Bivariate (4)	Multiv. (5)	Multiv. (6)
Age of household reference persona						
18-24 yrs	1 Ref	1 Ref	1 Ref	1 Ref	1 Ref	1 Ref
25-54 yrs	0.55***	0.66*	0.72*	0.50***	0.58**	0.62*
55 yrs and over	0.35***	0.22***	0.51**	0.18***	0.11***	0.30***
The quintiles of percentage of household expenditure on alcohol						
No alcohol expenditure	1 Ref	1 Ref	1 Ref	1 Ref	1 Ref	1 Ref
Lowest quintile (average 0.4% of total household expenditure)	1.15	1.09	1.04	1.50*	1.47*	1.41
Second quintile (average 1.3% of total household expenditure)	1.05	0.96	0.90	1.46*	1.30	1.27
Third quintile (average 2.4% of total household expenditure)	1.30*	1.03	1.03	1.31	1.04	1.03
Fourth quintile (average 4.2% of total household expenditure)	1.24*	0.90	0.87	1.49*	1.16	1.17
Highest quintile (average 10.6% of total household expenditure)	1.71***	1.20*	1.17	1.82***	1.39*	1.32
Gross income						
Lowest	1 Ref	1 Ref	1 Ref	1 Ref	1 Ref	1 Ref
Second	0.90	0.92	0.90	0.91	0.89	0.79
Third	0.84	0.63***	0.58***	0.84	0.52***	0.46***
Fourth	0.57***	0.35***	0.30***	0.74*	0.37***	0.35***
Highest	0.27***	0.16***	0.12***	0.28***	0.13***	0.13***
Number of dependents under 15 years in household						
No dependent child	1 Ref		1 Ref	1 Ref		1 Ref
1 dependent child	1.65***		1.48***	1.81***		1.44*
2 dependent children	1.64***		1.35**	2.18***		1.70***
3 dependent children	2.60***		2.07***	3.06***		2.39***
4 or more dependent children	10.54** *		5.95***	8.28***		4.74***

N=9774	Prevalence of financial difficulties			Experienced 2 or more types of financial difficulties		
	Bivariate (1)	Multiv. (2)	Multiv. (3)	Bivariate (4)	Multiv. (5)	Multiv. (6)
Number of males in household						
No male	1 Ref		1 Ref	1 Ref		1 Ref
1 male	0.74***		1.13	0.83		1.10
2 or more males	0.99		1.77***	1.14		1.28
Housing tenure type						
Renter	1 Ref		1 Ref	1 Ref		1 Ref
Owner without a mortgage	0.26***		0.28***	0.12***		0.19***
Owner with a mortgage	0.42***		0.59***	0.37***		0.52***
Other types	0.46***		0.38***	0.20***		0.19***

Note: * p <0.05, **p<0.01, ***p<0.001; ^a The household reference person is chosen through a set of operating procedures designed to identify the person most likely to be representative of the household or income unit [8].

Determinants of alcohol expenditure

Linear regression models were employed to estimate determinants of household expenditure on alcohol (Table 7). Models were developed both for simple alcohol expenditure (in dollars) and for the proportion of total expenditure spent on alcohol. Household expenditure on alcohol varies significantly by age, income, living area, number of dependents under the age of 15 in the household, number of males in the household and housing tenure type.

Alcohol expenditure by younger households (18-24 year olds) was significantly higher than expenditure by middle-aged and older households. Compared to 18-24 year old households, 25-54 years households spent \$14.28 less per week and households aged over 54 spent \$28.85 less per week. The results of the bivariate regression model also suggest that higher income households spent significantly higher amounts of money on alcohol than lower income households. The highest income households spent \$45.51 per week more than the lowest income households. Number of males in the household was positively associated with alcohol expenditure in the household: households containing two or more males spent \$33.61 more on alcohol beverages weekly than households with no males.

In contrast, a higher number of dependent children under 15 years old in the household predicted significantly lower alcohol spending. The household's alcohol spending is also significantly related to housing tenure type. Households in dwellings they owned, both with and without a mortgage to pay, spent \$6.83 and \$7.96 respectively less per week on alcohol than renters. Households that reported one or two types of financial difficulties spent significantly less money on alcohol than the households which had no financial difficulties in the last 12 months. No significant differences in alcohol

expenditure were found between the households in capital cities and small cities or rural areas in the bivariate model.

The results of the multivariate models (models two and three) were similar to the results of the bivariate regression. However, there was a significant difference in alcohol spending found between the households in the capital cities and those in the remainder of the states. Households in capital cities spent \$4.28 less on alcohol each week than households in small cities and rural areas. The results of the multivariate model three suggest that the experience of financial difficulties was not significantly related to the household's alcohol spending when the effects on alcohol expenditure of other key factors are taken into consideration.

Table 7. Linear regression analysis on the determinants of household expenditure on alcohol #

N=9774	Alcohol expenditure (\$)			Percentage of alcohol spending in household expenditure (%)		
	Bivariate (1)	Multiv. (2)	Multiv. (3)	Bivariate (4)	Multiv. (5)	Multiv. (6)
Age of household reference persona						
18-24 yrs	0 Ref	0 Ref	0 Ref	0 Ref	0 Ref	0 Ref
25-54 yrs	-14.28	-19.58*	-14.37*	-1.52***	-1.4**	-0.98*
55 yrs and over	-28.85***	-22.10**	-20.63**	-1.46***	-1.37**	-1.09*
Gross income quintiles						
Lowest	0 Ref	0 Ref	0 Ref	0 Ref	0 Ref	0 Ref
Second	3.35**	2.93*	2.26	0.23	0.20	-0.01
Third	12.73***	11.28***	7.98***	0.63**	0.58*	0.32
Fourth	23.31***	21.80***	16.94***	0.50**	0.49*	0.27
Highest	45.51***	44.54***	36.56***	-0.10	-0.05	-0.30
Living area						
Capital cities	0 Ref	0 Ref	0 Ref	0 Ref	0 Ref	0 Ref
Balance of the State	0.47	3.79*	4.28*	0.41	0.36	0.38
Number of types of financial difficulties experienced						
No financial difficulty	0 Ref		0 Ref	0 Ref		0 Ref
Experienced one type of difficulty	-5.03*		-0.84	0.21		0.11
Experienced two types of difficulties	-10.75***		-5.07	0.02		-0.17
Experienced three or more types of difficulties	-5.47		-3.91	0.76		0.47

N=9774	Alcohol expenditure (\$)			Percentage of alcohol spending in household expenditure (%)		
	Bivariate (1)	Multiv. (2)	Multiv. (3)	Bivariate (4)	Multiv. (5)	Multiv. (6)
Number of males in household						
No male	0 Ref		0 Ref	0 Ref		0 Ref
1 male	19.95***		11.78***	1.19***		1.36***
2 or more males	33.61***		25.24***	0.78**		1.47***
Number of dependents under 15 years in household						
No dependent child	0 Ref		0 Ref	0 Ref		0 Ref
1 dependent child	-3.09		-19.35***	-0.60***		-0.76**
2 dependent children	-3.52		-22.71***	-0.53**		-0.75*
3 dependent children	-6.98**		-27.37***	-0.75***		-1.02*
4 or more dependent children	-14.92***		-29.63***	-1.00**		-1.57**
Housing tenure type						
Renter	0 Ref		0 Ref	0 Ref		0 Ref
Owner without a mortgage	-7.96***		-5.23*	-0.53***		-0.49*
Owner with a mortgage	-6.83**		-2.09	-0.93***		-0.81***
Other types	-10.99**		-5.47	0.11		-0.28

Note: * p <0.05, **p<0.01, ***p<0.001;

^a The reference person is chosen through a set of operating procedures designed to identify the person most likely to be representative of the household or income unit (ABS, 2011a); The proportion of household expenditure on alcohol was multiplied by 100 for a better presentation of the results.

[#] The coefficient values in the table show the difference of amount of money or percentage of total household expenditure spent on alcohol between reference group and compared groups. For instance, -28.85 indicates that over 54 year old households spent average \$28.85 less per week on alcohol than 18-24 year old households.

The results of the models based on proportion of expenditure rather than just simple expenditure are presented as models four, five and six. They are broadly consistent with the previous models. Age of household reference person, household income, number of dependents under 15 in household and housing tenure type are the key factors related to the proportion of household expenditure spent on alcohol.

Discussion

This study has presented a statistical analysis of alcohol expenditure in Australia. Household expenditure on alcohol was compared with the expenditures for other goods and services in the initial phase of the report. Australian households spent a large amount of money on alcohol - greater than the spending on tobacco, personal care and education, and similar to expenditures on fuel and power, and clothing and footwear. This finding is consistent with previous studies in other countries (such as Pu et al., 2008; and Jankhotkaew et al., 2012).

The results also suggest that Australian households spent more money on alcohol for off-licence purchases than at on-licence premises. This reflects that, while prices per unit of alcohol are considerably cheaper for off-licence alcohol, a high proportion of alcohol in Australia is purchased at off-licences. The ratio of average alcohol spending by households at off- and on-licence premises is 1.7, but the ratio reaches 2.3 in the lowest income quintile group, and on the other hand is 1.4 in the highest income quintile. This difference suggests that lower income households are more likely to purchase alcohol from off-licence premises compared with higher income households, which makes sense given the large price differential between on- and off-licence alcohol beverages.

Alcohol expenditure varies across different states and territories in Australia. Households in NT spent the highest amount of money and the highest proportion of gross income on alcohol each week, while households in SA and Tasmania spent smaller proportions of income on alcohol. Given there is no significant variation in alcohol prices across Australian states and territories (because alcohol price policies and regulations are implemented at the national level), this finding suggests that the higher alcohol spending in a state or territory is due to higher alcohol consumption in that area. This finding is supported by previous studies identifying the NT as having particularly high levels of alcohol consumption (AIHW, 2011).

The international comparison of alcohol expenditure between Australia and other countries shows that Australian spending patterns are quite similar to those in Finland and the UK. However, compared to Iceland, Norway and Sweden, Australian households have a lower percentage of expenditure on alcohol, but higher per-capita alcohol consumption. This reflects that alcohol prices in Australia are more affordable, given the standard of living, than in the majority of selected countries (ranked fifth in 12 countries).

A positive association was found between the percentage of household expenditure on alcohol and financial difficulties experienced by households at the aggregated state and territory level. This positive relationship was also found in the bivariate logistic regression models. However, when controlling for the effects of age, income, number of dependents under the age of 15 in the household, number of males in the household, and housing tenure type, this relationship became statistically insignificant. Nevertheless, the results of bivariate analyses suggest that a decrease in the alcohol spending in a household may effectively help to reduce the household's financial problems, although further research is needed to explore this relationship. Generally, alcohol expenditure has substitutive relationships with expenditures on necessity goods and services (Pu et al., 2008), such as utilities, food, clothes, footwear and health services. A reduction in alcohol spending in the household may save money for necessities and improve the living standards for households.

Our findings here highlight the importance of studying household expenditure and spending habits. The study highlights that alcohol makes up a significant proportion of household expenditure in Australia, particularly for young people. In an international context, alcohol expenditure in Australia is a relatively low proportion of total household expenditure, particularly in light of the relatively high

per-capita consumption, suggesting that alcohol is relatively affordable once general spending patterns are taken into account.

Finally, we found suggestive evidence of links between alcohol expenditure and financial difficulties for the household, suggesting that alcohol policies targeted at price and availability may have a role in reducing financial problems (again, particularly in younger households).

The analyses presented here are limited by the lack of data on actual consumption (as distinct from purchase) in the HES. Future studies that use a combination of alcohol expenditure and alcohol consumption data are likely to provide valuable insights into the links between financial factors and heavy drinking. Similarly, longitudinal studies of alcohol expenditure may provide more robust evidence of the impact of the changing policy environment in Australia over recent decades.

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