

2013

# Data Mining Report

Chardonnay Project

Charles Sturt University  
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## Executive summary

This report presents a summary of Australian wine consumers' purchase and consumption behaviour derived from data-mining. As part of the projects 'Attitudes, Drivers of Consumption and Taste: A focus on Chardonnay' two Australian population surveys were conducted: One focused on societal attitudes toward wine in general and another focused on attitudes toward Chardonnay (see final report: *Attitudes, Drivers of Consumption and Taste Preferences: A Focus on Chardonnay, 2012*). Whilst each survey served a unique purpose within the original project deliverables, in terms of purchasing and consumption behaviour of wine in general, both surveys contained the same questions. As such, to extend upon the original findings, the present report presents findings obtained by combining and data-mining the two datasets.

The major findings indicate that males consume the most wine, prefer red wine and pay the least per bottle (except in the highest price range). Conversely, females consume less, prefer white and sparkling wines and pay the most per bottle of wine. The highest income earners (> \$200,000) spend the most per month on wine, however this relationship is not linear as the second highest spending on wine per month came from the third highest income earners (\$75,001 – 100,000). Wine variety across states and territories varies little except for fortified wine where the Northern Territory consumes twice as much as other states. Education shows no impact on how frequently people consume wine; however age shows a positive relationship with wine consumption and a negative relationship with price paid per bottle. That is, older wine consumers purchase more wine at a lower price, whereas younger consumers purchase less wine at higher price. Thus a more expensive wine is more likely to be purchased by a younger infrequent wine drinker than an older frequent wine drinker.

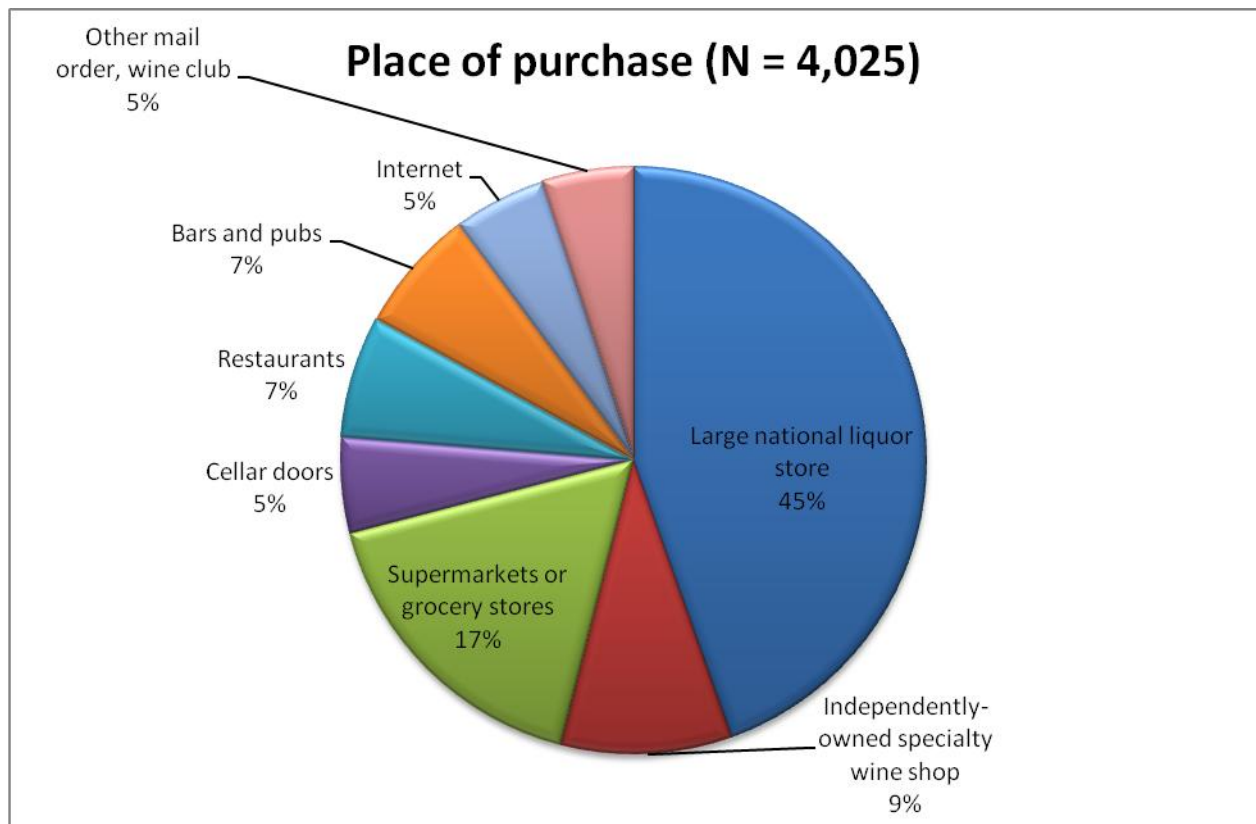
## Introduction

The following report details the results obtained from data-mining on two questionnaires conducted online in 2012. One survey was in regards to social attitudes to wine, the second attitudes to chardonnay. Both surveys derived 2,000 responses each, allowing for an adequate representation of the population. Many of the findings support previous research and reports published on wine consumers while other findings either differ or have not previously been reported. Overall, the current report details the latest findings on wine consumer behaviours.

## Place of purchase

While large national liquor stores have greater capacity to sell more wine, internet sales of goods in general is thought to be increasing. Participants were asked to divide their wine purchasing over the last 12 months among various retail outlets. As Figure 1 indicates, participants were most likely to purchase wine from large national liquor stores (45%), followed by supermarkets and grocery stores. In combination, bars, pubs and restaurants make up 14% which is a decrease on previous reports of 19%. Internet and mail order wine combined constitute 10% of total sales. Internet purchases of wine in the past made up only 1-2% of sales. The current findings of 5% (excluding mail order) suggest that more consumers are choosing to buy wine online. This increase points to the importance of direct to consumer (DTC) sales which are of great benefit to a winery as they come at full margin.

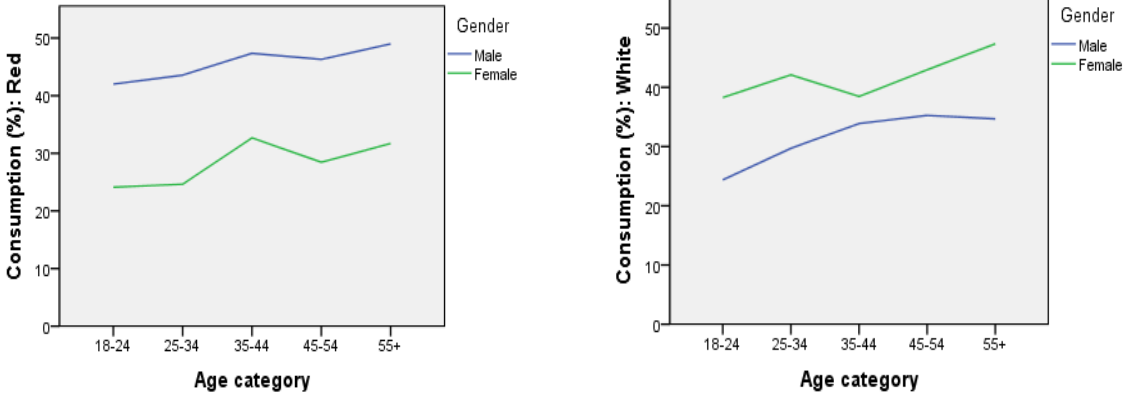
Although these are simple findings, few studies in the past have reported on these statistics based on such a large sample, therefore these results can be considered more representative of Australian consumers. Moreover, these data were collected in 2012, so are more up to date than anything else freely available, to our knowledge.



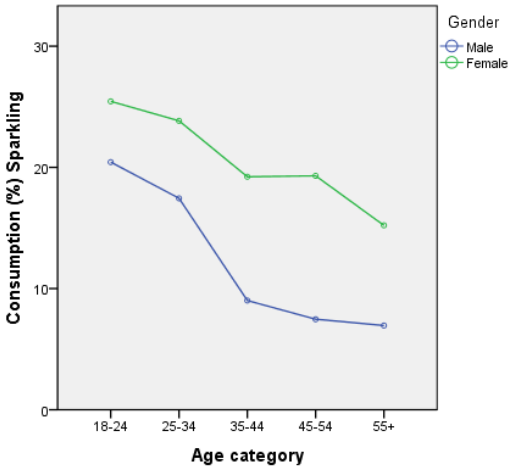
**Fig.1.** *Places where wine is normally purchased*

## Gender, age and wine consumption patterns

As shown in Figure 2a, males in all age categories consume larger quantities of red wine in comparison to other varieties, followed by white wine. For females, this pattern is reversed with a larger percentage of white wine consumed, followed by red wine. Women reported purchasing sparkling wine more than males, with the pattern declining with age (Figure 2b). At closer examination, it appears that while females drink less sparkling with age, white and red wine consumption increases. This latter phenomenon has not been reported elsewhere in the literature to our knowledge.



**Fig. 2a.** Male versus Female, Age Category and Percentage of Total Wine Consumption of Red and Wine



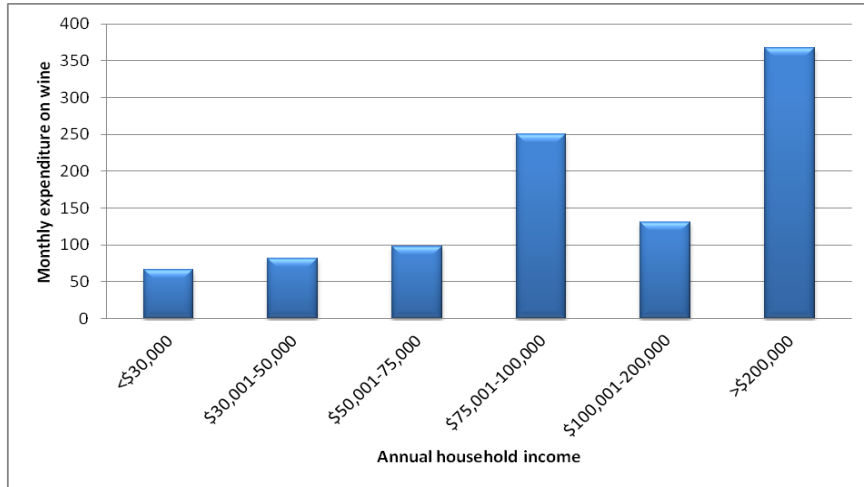
**Fig. 2b.** Male versus Female, Age Category and Percentage of Total Wine Consumption of Sparkling Wine

### Income and monthly expenditure on wine

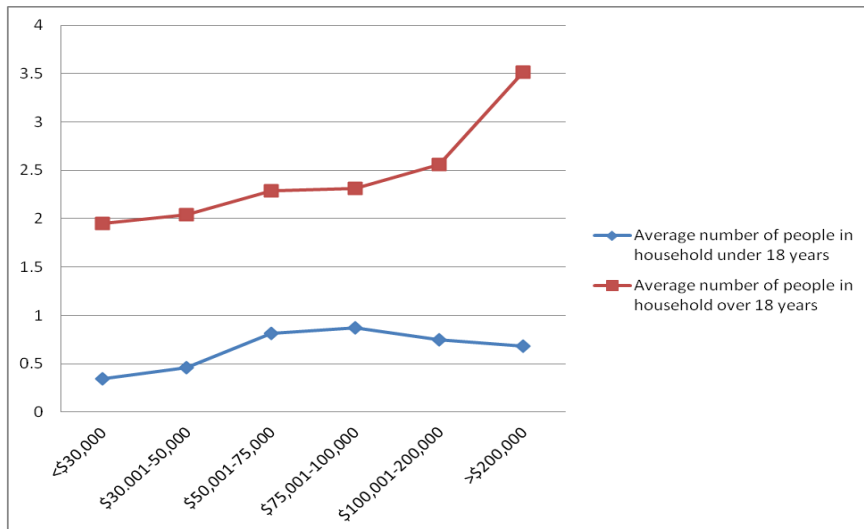
As expected, monthly expenditure on wine was lowest in the first three income categories (Figure 3a). While wine sales are targeted toward higher income earners with more disposable income, it appears from the current findings that it may not be the case that higher earners necessarily spend more on wine. The highest annual household income bracket of over \$200,000 spend the most on wine but that the third highest (\$75,001 - \$100,000) spend considerably more

on wine than the second highest (\$100,001 - \$200,000). This pattern holds irrespective of the fact that fewer children and more adults live in households of the latter income bracket (Figure 3b).

However price paid per bottle of wine varies only slightly across income categories (Figure 3c).

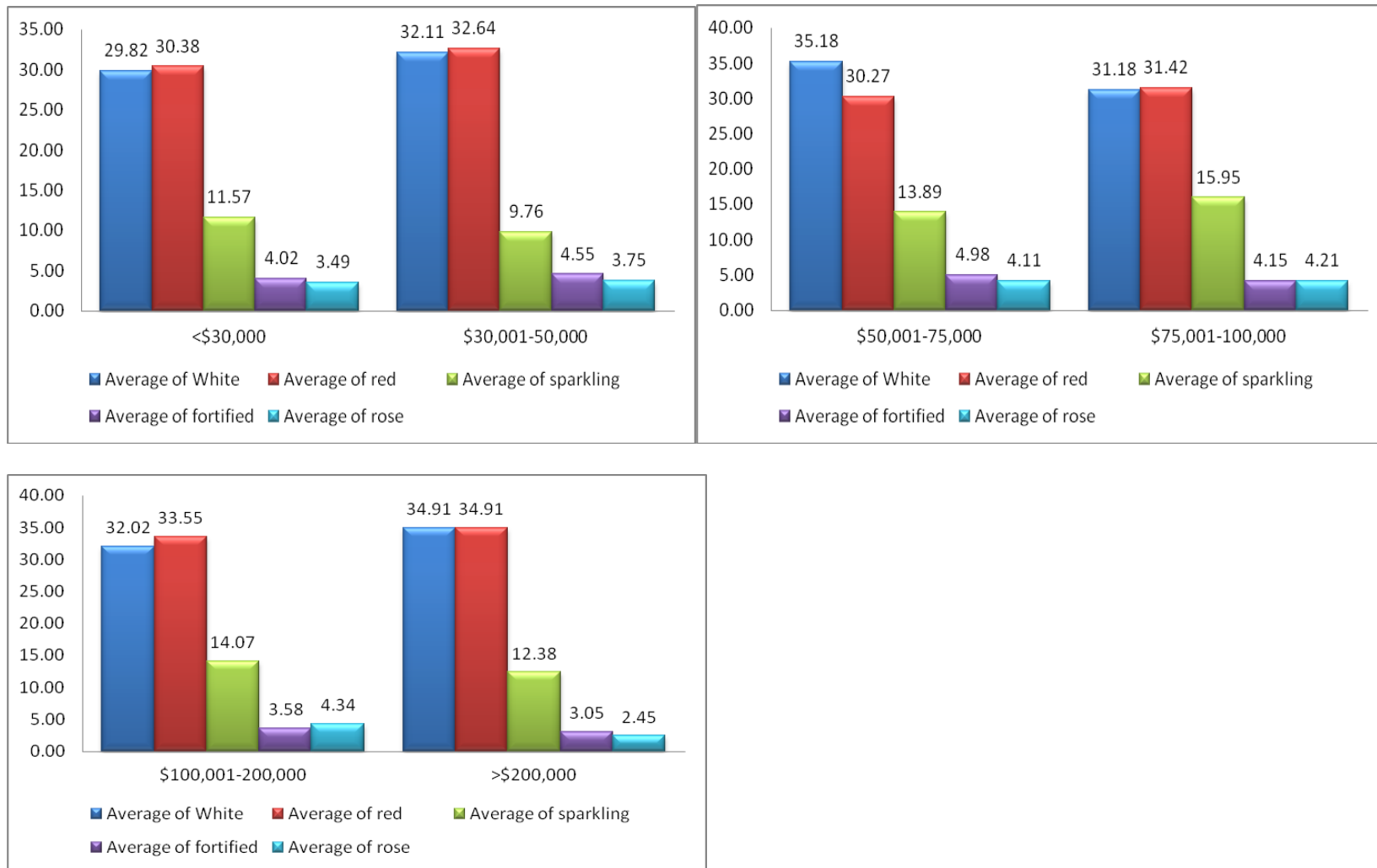


**Fig.3a.** Monthly Expenditure on Wine in Each Annual Household Income Category ( $N = 4,025$ )



**Fig. 3b.** Average Number of People Living in Household ( $N = 4,025$ )

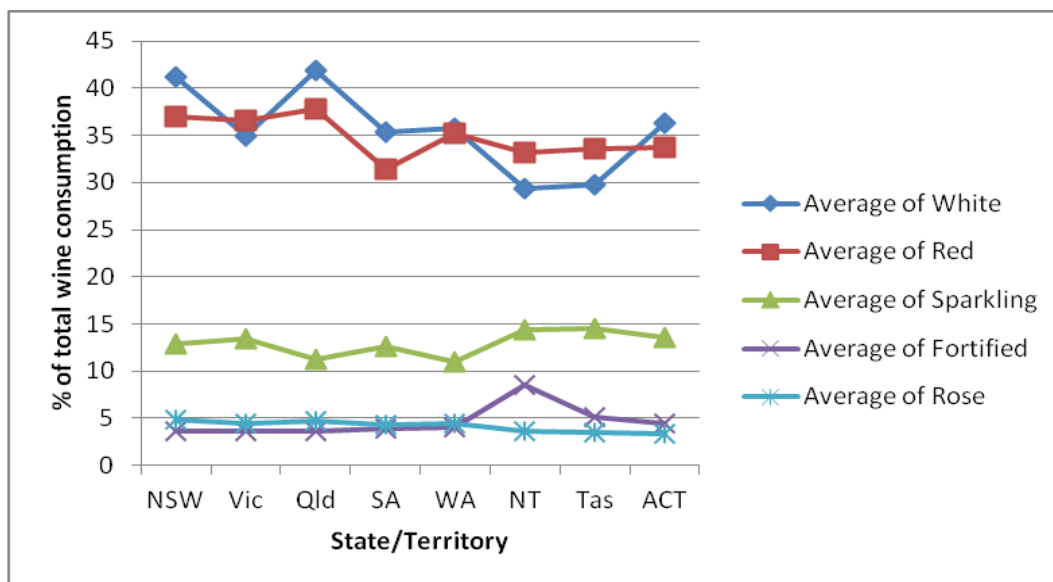




**Fig. 3c.** *Income Category and Price Paid per Bottle for Each Variety*

## Differences in wine type consumed between Australian states and territories

Across states and territories, the general pattern of wine variety consumed did not differ significantly. White wine appears slightly more popular in New South Wales, Queensland and the ACT. Purchasing of fortified wine in the Northern Territory however, was close to double than that of other states at almost 10% of total wine consumption. Rosé came out similar in all states at just under 5% of total wine consumption.

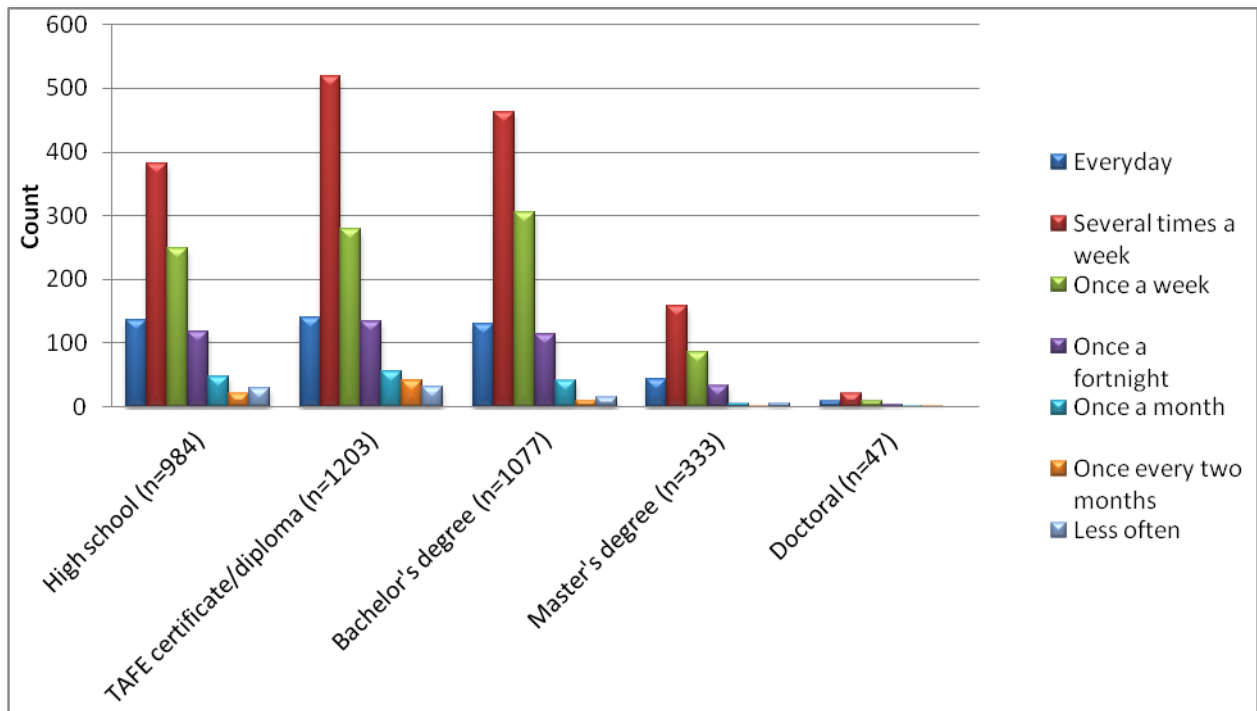


**Fig.4.** Average Percentage of Wine Variety Consumed Across Australian States/Territories ( $N = 4,025$ )

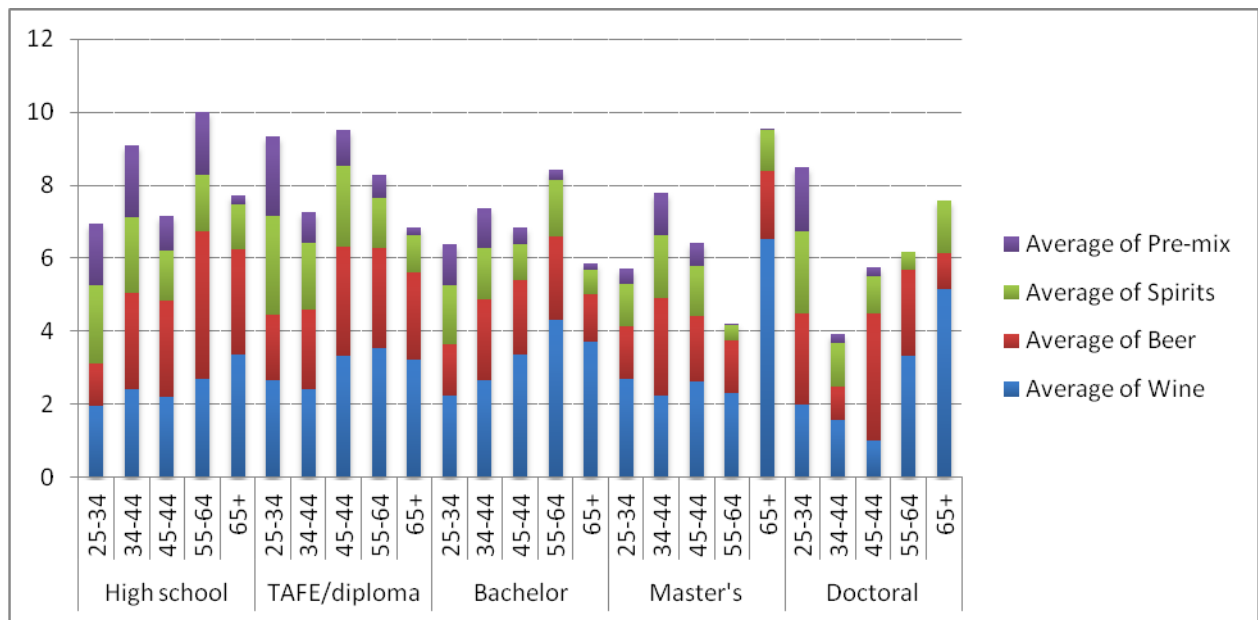
## Education, wine consumption and frequency

Comparisons between education level and frequency of wine consumption were fairly similar across categories. In each group most consumed wine several times per week, followed by once a week and then every day (Figure 5a.). To take this analysis further each education level was segregated into age categories and compared with average number of standard drinks

consumed within this time of wine, beer, pre-mix and spirits (Figure 5b.). Education level *per se* was not related to how much wine people consumed but rather correlated with age, particularly in the over 55 age group. A greater number of pre-mix drinks were unsurprisingly reported in the younger age group, demonstrating that some younger people prefer these sorts of drinks to wine more so than older age groups. This pattern could be due largely to the decline in preference for sweet beverages with increasing age, whereas younger individuals experimenting with alcohol prefer sweet tastes.



**Fig.5a.** Level of Education and Frequency of Wine Consumption

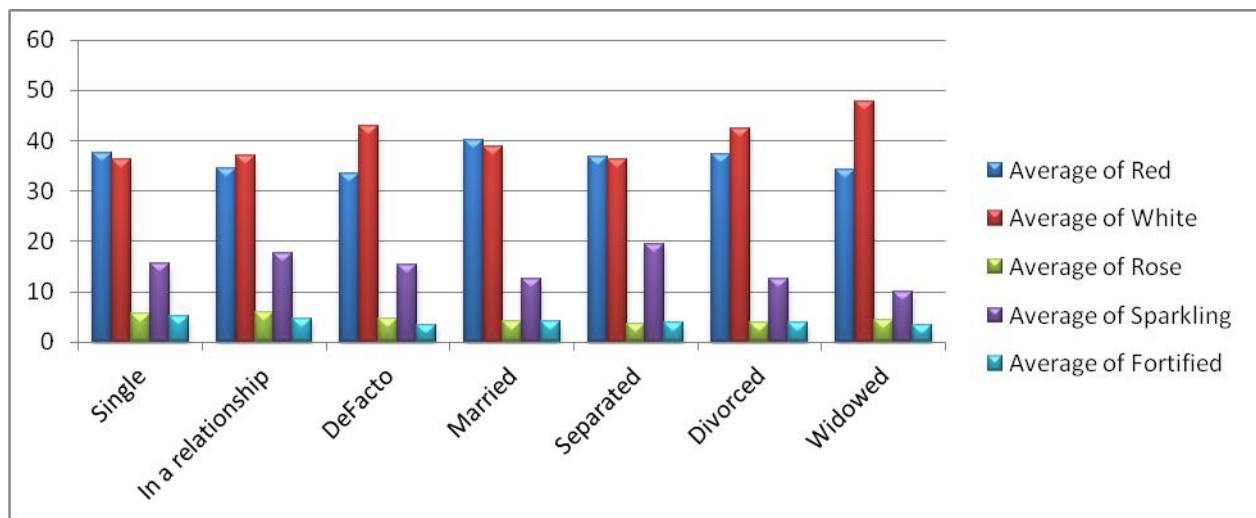


**Fig.5b.** Number of Standard Drinks Consumed Within Each Education and Age Category of Pre-mix, Spirits, Beer and Wine

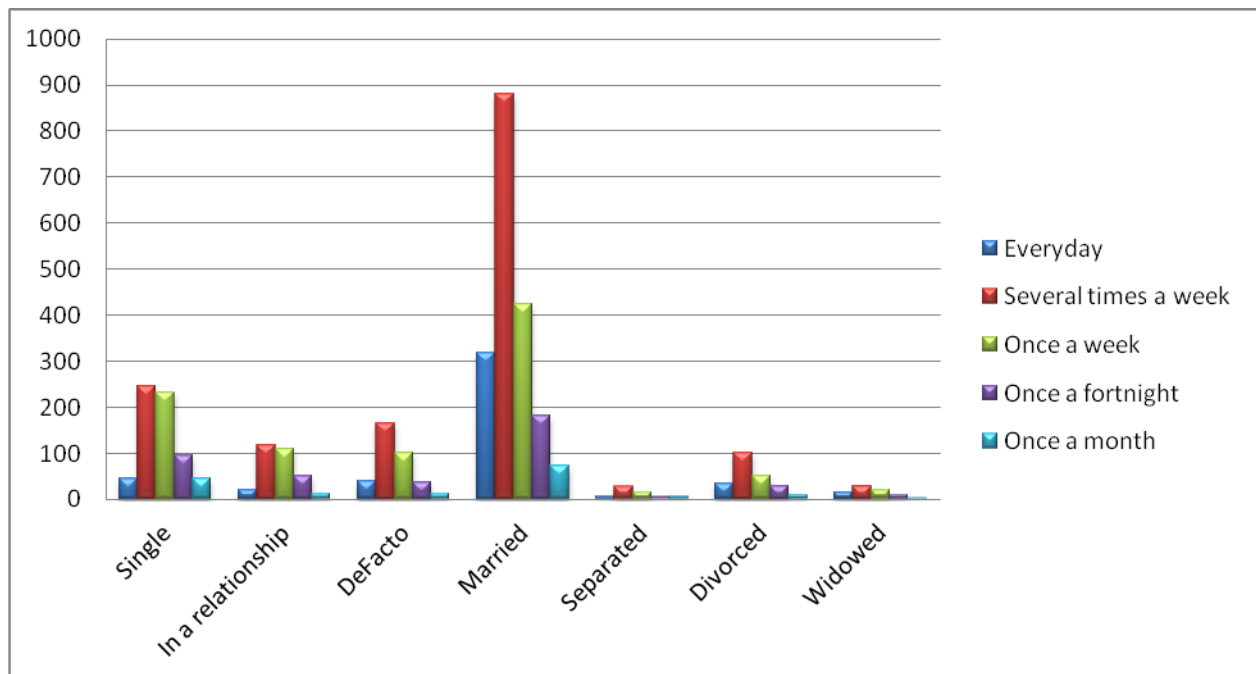
### Marital status, wine consumption and frequency

Wine preference was measured by instructing respondents to divide their normal consumption of wine over the previous 12 months between each variety to add up to 100%. Figure 6a shows very little difference between consuming red and white wines for singles, those in a relationship, married and separated individuals. A slight preference for red wine was shown for those in a de facto relationship and divorced individuals. A stronger preference for red over other varieties for widowed respondents is shown, but as discussed earlier, red wine preference increases somewhat with age and particularly for males which may account for this result with older respondents more likely to be widowed. No difference across marital status was found for rosé and fortified wines; however the percentage of sparkling wine consumed was greater for separated individuals and those in a relationship.

In Figure 6b, relationship status and wine consumption frequency varies significantly. Married individuals are significantly more likely to consume wine several times a week, followed by once a week then daily; similarly for divorced respondents and to a lesser degree for those in de facto relationships. For singles, those in a relationship, separated and widowed there is little difference between numbers who drink several times a week and once a week, although this is difficult to judge as very few numbers for separated and widowed individuals was obtained.



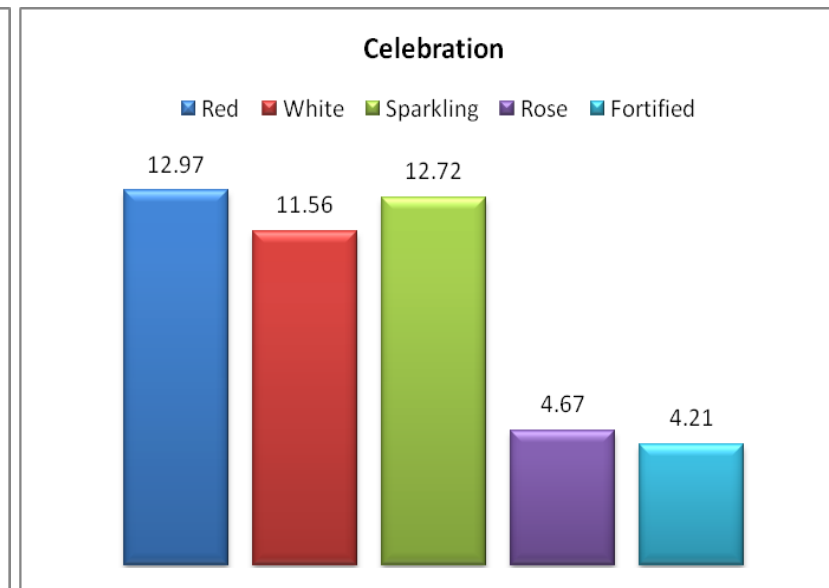
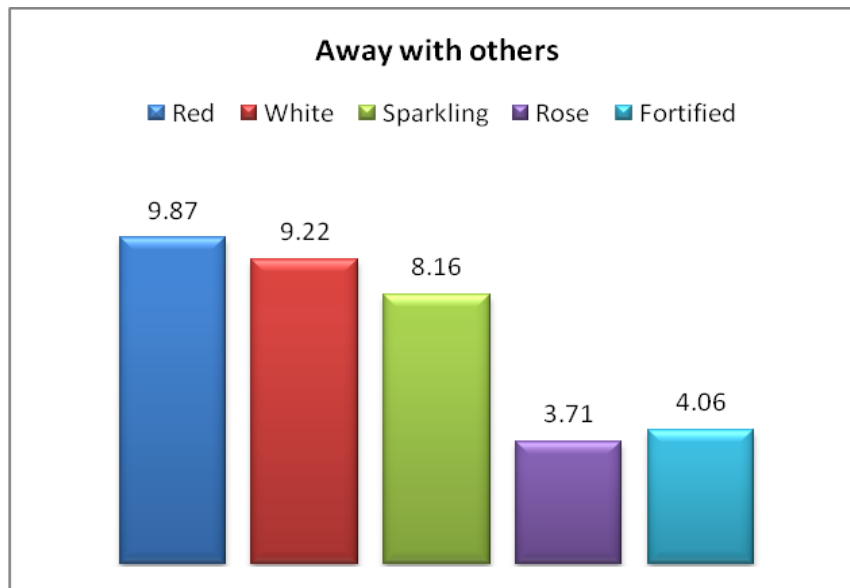
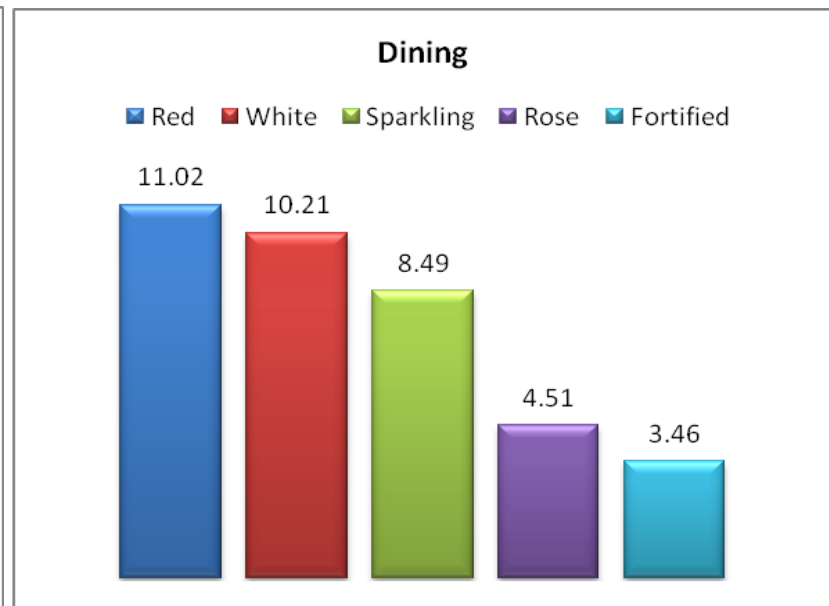
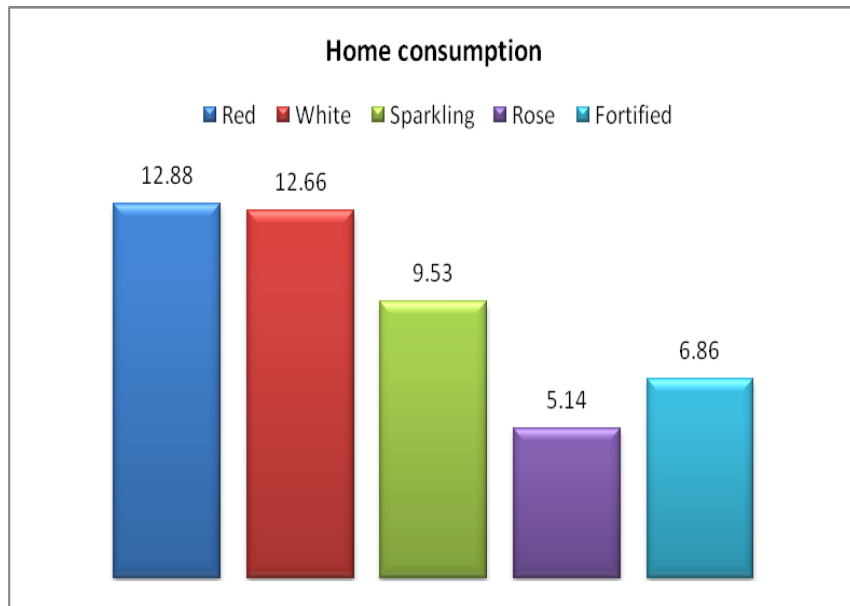
**Fig.6a.** *Marital Status and Wine Type Consumed*



**Fig. 6b.** *Marital Status and Frequency of Wine Consumption*

### Differences in price paid per bottle across occasions

Across all wine types, respondents reported paying the highest average price per bottle for red wine on all four occasions: home consumption, dining, away with others and for celebration. Red wine was followed by white wine, except for celebration where sparkling wine was second highest (Figure 8). For sparkling wine, people appear to pay more per bottle for a special occasion than any other occasion. This suggests that the more expensive sparkling wines are reserved for a special occasion and the cheaper sparkling wines for consumption at home. For rosé and fortified wine the average price appeared somewhat low, particularly for occasions when away from home, this may be due to the fact that these varieties are not consumed often or that people often purchase these by the glass when away from home.



**Fig.8.** Average Price Paid Per Bottle For Each Occassion

## Cluster analysis

A two-step cluster analysis was performed on the two most popular wine varieties: red and white wine and purchasing price for home and restaurant consumption and number of bottles consumed per month (household) along with demographics. A two-step cluster analysis allows for both continuous and categorical variables to be entered with the output organised into two or more mutually exclusive groups, where members of the groups share properties in common. The current analysis yielded four clusters (Table 1). Cluster 1 contains the lowest mean price per bottle and the highest mean number of bottles consumed (household) in a month. This pattern reverses through Clusters 2 and 3 with Cluster 3 containing the second highest price paid per bottle with least consumed. Cluster 4 contains a small number of consumers (n = 15; 10 males and five females) paying high prices for wine with ‘average’ consumption per month. As the fourth cluster is small the following discussion will exclude this group of consumers.

Along with the lowest price paid per bottle and highest consumption of wine, Cluster 1 includes the highest percentage of males and frequency of wine consumption. Over one-third of those from Australian Capital Territory, Queensland and South Australia are represented in this cluster and almost all retirees, 80% of those over 55 years and 90% widowed belong to Cluster 1. Lower education (high school and TAFE certificate/diploma) and household income (< \$30,000 – \$50,000 per annum) are found to be more frequent in this category.

Cluster 2 contains the highest sample size with over half of those from the Northern Territory, South Australia, Tasmania and Western Australia. Additionally, this group contains the highest stay at home parents, managers and administrators and higher educated individuals (Master’s and Doctorate). Males and females are almost equal and consumption frequency



ranges from several times a week and the least consumption of once every two months or less. Close to 90% of those aged 35 to 54 and over half of those married, de facto or separated are in this cluster. The highest annual household income (\$75,000 to > \$200, 000) also has the highest frequency in Cluster 2.

Cluster 3 has the highest mean price paid per bottle but also the lowest consumption and frequency of once a week or once a fortnight. Over a third of females and close to a third of Victorians and those from New South Wales are in this group. Ninety percent of students, over half of those between work and around a third of those with a Bachelor's or Master's degree are in Cluster 3. This cluster also contains over 90% of 18-24 and almost half of those in the 25-34 age categories. Most individuals in Cluster 3 are either single or in a relationship and in the highest income category (> \$200,000).

**Table 1.** Means and Standard Deviations for Price Paid Per Bottle (Red and White Wine) for Home and Restaurant Consumption and Bottles Consumed in a Month (Household) Along with Frequencies of Demographics within Each Cluster and Total Sample

<b>Variable</b>	<b>Cluster 1</b> ( n = 429)	<b>Cluster 2</b> ( n = 753)	<b>Cluster3</b> (n = 387)	<b>Cluster 4</b> (n = 15)	<b>Total Sample</b> ( n = 1584)
<b>Mean (SD)</b>					
Red (home)	9.06 (6.80)	11.83 (10.87)	14.96 (18.19)	172.07 (217.14)	13.36 (28.49)
Red (restaurants)	8.69 (10.15)	10.86 (12.19)	11.04 (14.74)	248.27 (152.80)	29.84 (13.02)
White (home)	9.15 (7.75)	11.51 (9.15)	14.82 (15.59)	152.80 (174)	13.02 (23.96)
White (restaurants)	8.05 (9.19)	10.22 (10.55)	11.19 (14.78)	213.60 (438.74)	11.79 (47.14)
Bottles/ month (Household)	7.94 (11.58)	5.61 (6.12)	4.66 (4.86)	5.87 (6.40)	6.01 (7.86)
<b>Frequency (%)</b>					
<b>Gender</b>					
Male	272 (34.6)	385 (49.0)	118 (15.0)	10 (1.3)	785
Female	157 (19.6)	368 (46.1)	269 (33.7)	5 (.6)	799

<b>Variable</b>	<b>Cluster 1</b> ( n = 429)	<b>Cluster 2</b> ( n = 753)	<b>Cluster3</b> (n = 387)	<b>Cluster 4</b> (n = 15)	<b>Total Sample</b> ( n = 1584)
<b>How often do you consume wine?</b>					
Everyday	118 (63.1)	53 (28.3)	13 (7.0)	3 (1.6)	187
Several time a week	165 (27.9)	328 (55.4)	94 (15.9)	5 (.8)	592
Once a week	68 (17.0)	172 (42.9)	157 (39.2)	4 (1.0)	401
Once a fortnight	25 (16.4)	70 (46.1)	55 (36.2)	2 (1.3)	152
Once a month	29 (21.5)	63 (46.7)	42 (31.1)	1 (.7)	135
Once every two months	11 (18.0)	34 (55.7)	16 (26.2)	-	61
Less than every two months	13 (23.2)	33 (58.9)	10 (17.9)	-	56
<b>State/Territory</b>					
ACT	6 (37.5)	7 (43.8)	3 (18.8)	-	16
NSW	142 (25.2)	260 (46.10)	157 (27.8)	5 (.9)	564
NT	4 (28.6)	8 (57.1)	2 (14.3)	-	14
Qld	94 (31.4)	141 (47.2)	61 (20.4)	3 (1.0)	299
SA	40 (34.8)	60 (52.2)	13 (11.3)	2 (1.7)	115
Tas	5 (14.7)	20 (58.8)	9 (26.5)	-	34
Vic	99 (25.2)	180 (45.8)	109 (27.7)	5 (1.3)	393

WA	39 (26.2)	77 (51.7)	33 (22.1)	-	149
<b>Variable</b>	<b>Cluster 1</b> ( n = 429)	<b>Cluster 2</b> ( n = 753)	<b>Cluster3</b> (n = 387)	<b>Cluster 4</b> (n = 15)	<b>Total Sample</b> ( n = 1584)
<b>Occupation</b>					
Production, transport	7 (14.6)	30 (62.5)	9 (18.8)	2 (4.2)	48
Trades person, labourer	9 (8.5)	72 (67.9)	22 (20.8)	3 (2.8)	106
Clerical, service	19 (9.9)	121 (63.4)	49 (25.7)	2 (1.0)	191
Manager, administrator	3 (1.4)	153 (70.5)	58 (26.7)	3 (1.4)	217
At home parent	-	110 (86.6)	15 (11.8)	2 (1.6)	127
Professional	11 (3.8)	196 (68.5)	76 (26.6)	3 (1.0)	286
Student	2 (1.6)	4 (3.2)	119 (95.2)	-	125
Between work	5 (8.9)	19 (33.9)	32 (57.1)	-	56
Retiree	354 (98.9)	4 (1.1)	-	-	358
Other	19 (27.1)	44 (62.9)	7 (10.0)	-	70

<b>Variable</b>	<b>Cluster 1</b> ( n = 429)	<b>Cluster 2</b> ( n = 753)	<b>Cluster3</b> (n = 387)	<b>Cluster 4</b> (n = 15)	<b>Total Sample</b> ( n = 1584)
<b>Education</b>					
High school	175 (38.5)	176 (38.8)	101 (22.2)	2 (.4)	454
TAFE certificate/diploma	135 (25.4)	282 (53.1)	110 (20.7)	4 (.8)	531
Bachelor's degree	84 (20.0)	200 (47.6)	134 (31.9)	2 (.5)	420
Master's degree	17 (13.3)	69 (53.9)	36 (28.1)	6 (4.7)	128
Doctoral	5 (20.0)	15 (60.0)	4 (16.0)	1 (4.0)	25
Other	13 (50.0)	11 (42.3)	2 (.7)	-	26
<b>Age</b>					
18-24	-	5 (2.4)	202 (95.7)	4 (1.9)	211
25-34	2 (.7)	147 (49.0)	142 (47.3)	9 (3.0)	300
35-44	1 (.4)	245 (86.0)	37 (13.0)	2 (.7)	285
45-54	17 (6.3)	250 (91.9)	5 (1.8)	-	272
55+	409 (79.3)	106 (20.5)	1 (.2)	-	516
<b>Marital Status</b>					
Single	31 (9.9)	67 (21.4)	210 (67.1)	5 (1.6)	313
In a relationship	5 (3.3)	11 (7.3)	133 (88.1)	2 (1.3)	151
De Facto	11 (9.9)	106 (72.1)	28 (19.0)	2 (1.4)	147

Married	294 (36.1)	502 (61.6)	16 (2.0)	3 (.4)	815
Separated	14 (38.9)	20 (55.6)	-	2 (5.6)	36
Divorced	46 (50.5)	44 (48.4)	-	1 (1.1)	91
Widowed	28 (90.3)	3 (9.7)	-	-	31

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**Income**

< \$30,000	116 (54.2)	40 (18.7)	57 (26.6)	1 (.5)	214
\$30,001 – 50,000	157 (51.6)	83 (27.3)	60 (19.6)	4 (1.3)	304
\$50,001-75,000	83 (25.1)	161 (48.6)	86 (26.0)	1 (.3)	331
\$75,001-100,00	46 (13.0)	205 (57.7)	101 (28.5)	3 (.8)	355
\$100,001-200,000	25 (7.6)	237 (72.0)	65 (19.8)	2 (.6)	329
>\$200,000	2 (3.9)	27 (52.9)	18 (35.3)	4 (7.8)	51

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