
Figures: 0
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**Under-reporting in alcohol surveys: whose drinking is under-estimated?**

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Abstract

Objective: Population surveys typically produce underestimates of alcohol consumption of around 40%-50%. Researchers often undertake a uniform adjustment of survey data to weight estimates such that they match measures of consumption based on sales or tax data. This study will explore whether there are differential rates of under-estimation in self-reported consumption data by comparing data from two major population surveys in Australia.

Method: The study compared survey estimates of consumption for population sub-groups from the National Drug Strategy Household Survey (NDSHS, using graduated frequency questions, coverage = 55%) and the Australian arm of the International Alcohol Control Study (IAC, using within-location beverage-specific questions, coverage = 86%). Analyses examined age and sex based sub-groups as well as sub-groups based on rates of heavy episodic drinking.

Results: The graduated frequency questions (NDSHS) underestimated consumption by 33% compared with the beverage-specific within-location questions (IAC). Underestimates were more marked for young males (40%) and middle-aged females (49%) and less marked for young females (15%) and old females (NDSHS estimates were 19% higher than IAC). Respondents who engaged infrequently or not at all in heavy episodic drinking underestimated their consumption by more (proportionally) than those who did (43% vs 22%).

Conclusions: Under-reporting of alcohol consumption in population surveys using standard graduated frequency questions is not uniform across either demographic or consumption-based sub-groups of the population. More robust approaches to adjusting survey data to match objective measures of consumption are required.
Under-reporting in alcohol surveys: whose drinking is under-estimated?

Introduction

The measurement of alcohol consumption using general population surveys is a methodologically complex endeavour with a vast array of approaches used (see Greenfield and Kerr, 2008; Midanik, 1988). In general, population surveys produce estimates of population level consumption that are substantially lower than objective measures based on sales or tax data (Gmel and Rehm, 2004; Greenfield and Kerr, 2008; Shield and Rehm, 2012). This underestimation has significant implications, impacting on risk curves and resulting in inaccurate aetiological fractions (Dawson and Room, 2000). The reasons for this under-coverage fall into two broad categories: non-response to surveys and inaccuracy of self-reported estimates of consumption.

In the first instance, the exclusion of key sub-groups of the population from the sampling frame (e.g. marginalised heavy drinkers) and the potential for heavy drinkers to be less likely to agree to participate in alcohol surveys are both potential drivers of survey under-coverage. There is little research on the impact of survey sampling frames on estimates of consumption – in the one study to directly assess these issues Mäkelä and Huhtanen found that, while homeless and otherwise marginalised people excluded from surveys were typically much heavier drinkers than the general population, they represented such a small proportion of the population that their exclusion was unlikely to greatly bias survey estimates of alcohol consumption (Mäkelä and Huhtanen, 2010). Similarly, studies that have attempted to evaluate the impact of unrepresentative refusal rates on consumption estimates have typically found that initial non-respondents are more likely to be non-drinkers than heavy drinkers (Lahaut et al., 2002; Lemmens et al., 1988), although Zhao et al provide a counter-example (Zhao et al., 2009). One study based on registry data did find that non-responders had higher rates of alcohol-related hospitalisations than responders, suggesting that some of the heaviest drinking members of the population may be more likely to refuse to participate in surveys (Romelsö, 1989). Thus, while non-response factors are important to consider when analysing population survey data on alcohol consumption, neither sampling frame issues nor survey...
non-response seem likely to completely explain the substantial under-coverage commonly seen in survey data.

The other major issue is inaccurate responses. There is good evidence that a substantial amount of the under-coverage evident in population surveys is related to recall bias. Thus, for example, Stockwell et al. (Stockwell et al., 2004) demonstrate that questions asking respondents for detailed measures of their consumption yesterday provide much greater coverage of objective measures of consumption than those that ask respondents to summarise their drinking patterns over the past twelve months. Similarly, studies consistently find that more detailed questions on consumption capture greater volumes, presumably because they prompt more specific recall (e.g. beverage specific questions make respondents consider more of their drinking than an overall measure does) (Dawson, 1998; Knibbe and Bloomfield, 2001).

A further issue likely to influence under-reporting is the use of standard drinks or units in questionnaires. Stockwell and colleagues partially attributed the higher levels of elicited consumption using the ‘yesterday’ method in their study to the fact that respondents could choose the units in which they consumed their alcohol, as compared to estimating the number of standard drinks consumed (Stockwell et al., 2004). There is good evidence that many people pour much bigger drinks than standards units used in most jurisdictions (Boniface et al., 2013; Callinan, 2014; Kerr et al., 2005), which is likely to result in under-reporting in standard surveys.

This under-reporting is generally taken as a necessary weakness of collecting self-reported alcohol data. However, Rehm and colleagues have demonstrated that utilising these uncorrected estimates of the distribution of drinking in the population can lead to significant underestimates of alcohol’s contribution to the burden of disease and have argued that survey-based estimates of consumption need to be up-shifted to match per-capita measures (Rehm et al., 2010; Shield and Rehm, 2012). In early work, survey consumption data was scaled up just for the heaviest drinking categories (Taylor et al., 2007), but in more recent studies a continuous alcohol consumption distribution is shifted up
to match measured per-capita consumption (Rehm et al., 2010; Shield and Rehm, 2012). One of the key underlying assumptions of this approach is that the under-coverage in survey estimates of consumption is consistent across all population sub-groups. As they note, this assumption has barely been tested in the literature. In one study, Stockwell and colleagues (Stockwell et al., 2014) contrast respondents answers to standard quantity-frequency alcohol questions with their responses to questions about yesterday drinking to examine differential reporting. They found that under-coverage in responses to the standard survey items was proportionally higher for young drinkers and for lighter drinkers. Contrastingly, studies focussing on specific drinking occasions have found some evidence that retrospective reports from heavy drinking occasions involve proportionally greater under-reporting than those from lighter drinking occasions (Kuntsche and Labhart, 2012; Northcote and Livingston, 2011).

In this study, we provide a further attempt to explore the relative rates of under-coverage across population sub-groups defined by socio-demographic and alcohol consumption. We do this by comparing the amount of alcohol measured in two different Australian surveys, one with a very high coverage of per capita consumption and one with levels more commonly seen in the literature.

**Methods**

We compare the coverage of two different surveys to provide some assessment of potential differences in reporting behaviour by population sub-groups. Firstly, we use the Australian arm of the International Alcohol Control Study (IAC), which uses the within-location beverage-specific alcohol consumption items developed by Casswell et al. in New Zealand (Casswell et al., 2002). Secondly, we use the 2010 wave of the Australian National Drug Strategy Household Survey (NDSHS), which uses the graduated frequency approach to measuring consumption (AIHW, 2011). It is worth emphasising, that the analyses presented below are framed around the assumption that the Australian IAC data provide a more accurate and reliable measure of population consumption than the NDSHS. While the IAC method reliably produces higher levels of coverage than most other
approaches, high coverage does not in itself imply accuracy (Gmel et al., 2014), and some authors have suggested that this method of data collection may over-estimate drinking frequency (e.g. Stockwell et al., 2004). The detailed coverage data presented below provide some reassurance, but this remains a key issue to keep in mind when interpreting the study’s findings. The remainder of this section will briefly outline the survey methods for each of these studies and the steps taken to ensure comparability for the analyses undertaken in this study.

**International Alcohol Control Study – Australian arm**

The IAC survey was a telephone survey using computer-assisted telephone interviewing. The sample was generated using random digit dialling and involved a deliberate over-sampling of risky drinkers (Two in three of those not reporting at least monthly drinking occasions of 5 or more Australian standard drinks (10g of alcohol) were not asked to participate). The study interviewed 2020 people aged 16 and over from across Australia in 2013, with an American Association for Public Opinion Research response rate of 37.2% (American Association of Public Opinion Research, 2006). Data were weighted to correct for probability of selection as well as to match the sample with population benchmarks based on age, sex and region. This weighting also adjusted for the over-sampling of heavy drinkers, so the weighted data are essentially representative of the general Australian adult population. Selected participants in the landline or mobile sample were asked how often they consumed five or more standard drinks in a session. Those who stated they did this monthly or more were asked to participate, one in three of those who stated that they did this less than monthly, or not at all (including abstainers), were asked to participate. In households with multiple eligible respondents the most recent birthday method of selection was used. Full details of the sampling methods, weighting and questionnaire design are available in the technical report (Jiang et al., 2014).

Respondents were asked a series of questions about their usual consumption across a variety of settings (their own home, someone else’s home, pubs/bars/nightclubs/taverns, clubs, restaurants,
at work, in public settings and at events). At each location they were able to specify the types of alcoholic beverages they consumed on a usual occasion (regular strength beer, mid strength or light beer, cider, cask wine, bottled wine, pre-mixed spirits, liqueurs, fortified wines and spirits). So, for example, if a respondent stated that they drank regular strength beer on a usual occasion in their own home they were then asked how much they usually drank in this situation. Respondents provided the amounts they consumed in their own units (e.g. pints of beer, bottles of wine etc) and volumes of pure alcohol were estimated by the research team based on average alcohol content and container sizes. The data were cleaned to deal with obvious outliers (e.g. a respondent who reported drinking 24 cartons of beer on a usual day would be recoded to 24 cans of beer/1 carton). Total volume of consumption was estimated by multiplying the frequency and volume reported for each beverage/setting combination.

To ensure comparability with the NDSHS, total volume was capped at an average of 21 standard drinks per day (this is the highest volume possible using the NDSHS questions). In order to provide capped estimates on the amount consumed per drink type or location for those who consumed an average of more than 21 standard drinks per day, the percentage of uncapped drinks consumed per location and drink type was applied to the capped total volume.

Respondents were also asked a single question about their overall frequency of drinking occasions where they consumed five or more drinks. This question did not involve beverage or context details and is directly comparable with the NDSHS questions allowing for some comparison of volume estimates for risky compared with non-risky drinkers.

*National Drug Strategy Household Survey*

The National Drug Strategy Household Survey is an Australian general population survey focussing on alcohol and drug issues that is conducted every three years. The NDSHS uses a ‘drop and collect’ method. Sampled households are approached by fieldworkers and the household member aged 12
or over with the next birthday is selected as the respondent and left with a copy of the questionnaire to complete. Completed surveys are collected by fieldworkers or mailed back. In 2010, a final sample of 26,157 Australians aged 12 and over was attained, with a response rate of 51%. Data were weighted to account for the probability of selection and to match the sample to population benchmarks based on age group, sex and region. The official survey report provides full details of data collection and weighting methodologies (AIHW, 2011). To ensure comparability with the IAC data, the sample analysed here was limited to respondents aged 16 or over (n=25,640).

Alcohol consumption data were collected using the graduated frequency approach. This series of items asks respondents to estimate how often (every day, 5-6 days per week, 3-4 days per week, 1-2 days per week, 2-3 per days per month, once a month, less than monthly, never) they drink at various levels (1-2 drinks, 3-4 drinks, 5-6 drinks, 7-10 drinks, 11-19 drinks, 20+ drinks). All questions are based on Australian standard drinks (10g of pure alcohol). A total volume of alcohol for each respondents is calculated by multiplying together frequency (using mid-points, so that 5-6 days per week is 5.5 * 52 = 286 days per year) and volume (again based on midpoints, so 11-19 drinks = 15 drinks). The top category (20 or more drinks) is conservatively coded as 21 drinks. Respondents who provide more than 365 drinking occasions are capped at their heaviest 365 occasions (Greenfield, 2000). Other approaches to the coding of the top category and to dealing with respondents who provide more than 365 drinking days have been used (e.g. Stockwell et al., 2004). We conducted sensitivity analyses using a range of other approaches (e.g. coding the top category to 25 drinks based on respondents’ answers to another question about their drinking the day before the survey; alternative ways of scaling respondents providing excess drinking days), but these had little impact on our findings and the details are not reproduced here.

**Analyses**

The total volume of alcohol covered by each of the two surveys was compared with sales estimates produced by the Australian Bureau of Statistics (ABS) (Australian Bureau of Statistics, 2014). These
sales estimates are derived from sales and excise data and represent only officially recorded consumption. Duty free and home produced alcohol are excluded, although these are likely low in Australia (Stockwell et al., 2004). The ABS data are presented as the volume of alcohol consumed per person aged 15 or more, while the data we present from surveys are based on populations aged 16 or more. It is worth noting that the amount of alcohol consumed in Australia according to the ABS data did not change markedly over the period in which the two surveys were conducted (10.5l per person in 2010 vs 9.9l per person in 2013) (Australian Bureau of Statistics, 2014).

Mean volume estimates with 95% confidence intervals were then calculated for each survey across a series of socio-demographic groups based on age, sex and socio-economic status as well as groups based on drinking behaviour. The estimates provide some specific estimates of differences in the degree of under-reporting between the two surveys based on socio-demographic factors. As the estimates for the two different methods of measuring alcohol consumption come from different surveys, it is not possible to directly test statistically for differences, so we focus on whether or not 95% confidence intervals overlap when discussing differences between surveys.

**Results**

Due to the nature of the NDSHS questions only its overall coverage can be estimated, while beverage-specific and on-/off-premise specific coverage can be estimated for the IAC. As the NDSHS data is from 2010 and the IAC from 2013, we use objective consumption data from the financial year 2011/12 (Australian Bureau of Statistics, 2014). The weighted total alcohol captured by the IAC survey is 8.65l of pure alcohol per person per year, while the equivalent NDSHS consumption estimate is 5.80l. The official consumption estimate provided by the Australian Bureau of Statistics (ABS) is 10.05l (Australian Bureau of Statistics, 2014), meaning that the coverage estimates of the IAC and NDSHS were 57.8% and 86.1% respectively. It should be noted that these coverage figures are based on the adjusted, comparable volume estimates and thus exclude 12-15 year olds from the
NDSHS and rely on a capped level of 21 drinks per day in the IAC. Actual coverage estimates may vary slightly in other publications.

A more detailed examination of the coverage of the IAC can be undertaken due to the surveys beverage and context specific questions. In Table 1 the volumes of alcohol estimated via the survey by beverage and setting are compared with volumes derived from the beverage-specific per-capita consumption estimates produced by the ABS and Euromonitor data that provides an on-premise/off-premise breakdown by beverage (Euromonitor International, 2012).

Even when broken down into beverage and setting level estimates, the coverage of the IAC is quite accurate, with the exception of on-premise wine consumption, which is substantially under-estimated.

Given the relative accuracy of the IAC consumption estimates, the remainder of this section will treat the IAC results as broadly accurate and assess the degree to which the NDSHS under-estimates consumption in comparison. Some broad survey estimates are presented in Table 2 – the IAC survey has a slightly higher proportion of abstainers than the NDSHS (23.7% vs 19.0%) and the two surveys have similar proportions of regular short-term risky drinkers (between 30%-35%), where the question on risky drinking is asked in the same way in both surveys. The IAC produces a higher prevalence estimate of long-term risky drinkers, reflecting its greater coverage of alcohol consumption more broadly.

Table 3 presents the mean consumption for socio-demographic groups across the two surveys. The NDSHS respondents underestimate their consumption in comparison to the IAC respondents in every demographic category barring women aged 70 or older. The magnitude of under-reporting is
roughly equivalent across age groups for males, but has marked variation among women. Women aged 30-49 underestimate their consumption by nearly half in the NDSHS in comparison to the IAC, while the youngest and oldest women have much more similar consumption estimates across the two surveys. Under-reporting of consumption in the NDSHS seemed broadly consistent across the quintiles of socio-economic status examined.

Finally, we compare the consumption captured by the two surveys for risky and non-risky drinkers. As both surveys included the same question about the frequency of 5+ drinking we are able to examine this question without overly biasing the results as we would if were dividing the population up based on the same questions that measured volume. Further, the fact that the two surveys produced similar prevalence estimates of monthly 5+ drinking (see Table 2) suggests that we are comparing roughly equivalent groups across the two surveys.

Proportionally, low-risk drinkers under-report their consumption more than risky drinkers, with the IAC capturing twice the amount of consumption compared to the NDSHS. Risky drinkers in the NDSHS still significantly under-report their consumption, with the IAC estimates about 45% higher.

Discussion

This study provides a rare analysis of the variation in rates of under-reporting in alcohol surveys across socio-demographic groups. As Rehm and colleagues (Rehm et al., 2010) have noted, a great deal of alcohol epidemiology is based on the assumption that the under-coverage of alcohol consumption in general population surveys is distributed evenly across the population. We combine two different surveys: one that uses standard alcohol consumption questions (and typically low coverage) and another with much more detailed questions with much higher coverage. In general, we find broadly consistent rates of under-reporting by gender, with men and women both under-
reporting their consumption by around 40% in the NDSHS compared with the IAC. There was a little
more variation in under-reporting rates across age groups, although no consistent pattern was
evident. The biggest outlier was the lack of under-reporting by women aged 70 and over, although
these estimates were based on relatively small samples. In contrast, there was a clear difference in
under-reporting rates by drinking pattern, with respondents who reported infrequent or no risky
drinking under-reporting their overall consumption in the NDSHS markedly compared with the IAC.
These last findings and the gender similarities in under-reporting match those reported by Stockwell
et al. (Stockwell et al., 2014), who found that infrequent drinkers under-estimate their consumption
more than frequent drinkers and found little difference between men and women in under-
reporting.

The reasons for these findings are not immediately clear. There are a range of reasons that the IAC
may produce higher coverage rates than the NDSHS, including the use of actual container sizes
rather than standard drinks (Kerr et al., 2005; Lemmens, 1994), the shorter recall period (Stockwell
et al., 2004) and the use of detailed beverage and context specific questions (Gmel and Rehm, 2004).
This last factor is likely to be a key factor in the relative under-reporting of lighter drinkers – the
prompting of the detailed context and beverage specific questions may improve recall particularly
for infrequent drinkers. Taken at face value, our findings suggest that failing to account for age- and
sex-specific differences in survey under-coverage is unlikely to dramatically bias epidemiological
estimates of alcohol consumption used, for example, in the global burden of disease studies (Rehm
et al., 2007). However, our findings do point towards a more important issue – providing more
evidence that survey under-reporting is proportionally higher for lighter drinkers, a finding that
raises important questions for methodological approaches to adjusting survey consumption
estimates. This last finding goes against some previous studies that have identified heavy drinkers as
more likely to under-report their consumption (Northcote and Livingston, 2011; Poikolainen, 1985),
but is consistent with Stockwell et al.’s analysis based on the ‘yesterday’ method of measuring
consumption. Future work asking the same respondents both the detailed context- and beverage-
specific questions used in the IAC and the standard GF items may provide further clarity here. In addition, studies combining prospective diary methods with retrospective survey measures would provide a more robust means for assessing under-coverage in surveys (although long term diary studies are likely to be difficult to implement).

The key assumption of the current study is that the IAC data represents a more accurate picture of population consumption than the NDSHS data. In general, it is taken as a given that greater coverage implies greater accuracy, although as Midanik and others (Midanik, 1988; Rehm, 1998) note, more reported alcohol does not necessarily mean more accurate reports. This is difficult to assess in the current study. However, the reasonably detailed accuracy of the IAC coverage at a beverage- and context-specific level provides some reassurance that it represents an accurate measure of population consumption. Despite this it is also worth noting that the IAC has a fraction of the participants of the NDSHS and a lower response rate. In light of this potential weakness, the findings presented here should be taken cautiously.

Acknowledgements

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References


*British Journal of Addiction, 80*(2), 215-216.


Table 1 – Alcohol consumption estimates from the Australian International Alcohol Control Study (IAC) compared with official apparent consumption data

<table>
<thead>
<tr>
<th></th>
<th>IAC</th>
<th>Official data</th>
<th>Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Off-premise On-premise</td>
<td>Total Off-premise On-premise</td>
<td>Total Off-premise On-premise</td>
</tr>
<tr>
<td>Beer</td>
<td>3.38 2.52 0.86</td>
<td>4.14 3.33 0.81</td>
<td>81.6% 75.5% 106.6%</td>
</tr>
<tr>
<td>Wine</td>
<td>3.13 2.70 0.43</td>
<td>3.80 2.85 0.95</td>
<td>82.3% 94.9% 44.8%</td>
</tr>
<tr>
<td>Spirits</td>
<td>2.01 1.56 0.45</td>
<td>1.94 1.45 0.49</td>
<td>103.8% 107.8% 92.0%</td>
</tr>
<tr>
<td>Cider</td>
<td>0.17 0.14 0.04</td>
<td>0.17 0.13 0.04</td>
<td>103.2% 104.0% 100.0%</td>
</tr>
<tr>
<td>Total</td>
<td>8.65 6.92 1.78</td>
<td>10.05 7.76 2.29</td>
<td>86.1% 89.1% 77.5%</td>
</tr>
</tbody>
</table>
Table 2 - Alcohol consumption estimates from the National Drug Strategy Household Survey (NDSHS) and the Australian International Alcohol Control Study (IAC) with 95% confidence intervals

<table>
<thead>
<tr>
<th></th>
<th>NDSHS</th>
<th>IAC</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total average volume (standard drinks)</td>
<td>458.1 (445.4-470.8)</td>
<td>682.7 (617.0-748.5)</td>
<td>1.49</td>
</tr>
<tr>
<td>Proportion abstainers</td>
<td>19.0% (18.2%-19.7%)</td>
<td>23.7% (20.7%-26.7%)</td>
<td>1.25</td>
</tr>
<tr>
<td>Proportion monthly risky drinkers (5+)</td>
<td>35.1% (28.8%-30.3%)</td>
<td>30.1% (27.8%-32.4%)</td>
<td>1.02</td>
</tr>
<tr>
<td>Proportion drinking &gt;2 drinks per day</td>
<td>21.5% (20.9%-22.2%)</td>
<td>27.0% (24.5%-29.4%)</td>
<td>1.26</td>
</tr>
</tbody>
</table>
Table 3 – Volume of alcohol reported in the National Drug Strategy Household Survey (NDSHS) and the Australian International Alcohol Control Study (IAC), by socio-demographic variables

<table>
<thead>
<tr>
<th></th>
<th>NDSHS</th>
<th>IAC</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Males</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-29</td>
<td>683.7 (632.4-734.9)</td>
<td>1132.1 (916.5-1347.7)</td>
<td>1.66</td>
</tr>
<tr>
<td>30-49</td>
<td>653.5 (617.9-689.2)</td>
<td>919.3 (664.6-1174.0)</td>
<td>1.41</td>
</tr>
<tr>
<td>50-69</td>
<td>633.2 (599.7-666.8)</td>
<td>903.8 (756.6-1051.1)</td>
<td>1.43</td>
</tr>
<tr>
<td>70+</td>
<td>433.5 (395.6-471.5)</td>
<td>609.3 (427.6-790.9)</td>
<td>1.41</td>
</tr>
<tr>
<td>Total</td>
<td>633.5 (612.0-655.0)</td>
<td>936.6 (824.6-1048.7)</td>
<td>1.48</td>
</tr>
<tr>
<td><strong>Females</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-29</td>
<td>368.6 (339.4-397.8)</td>
<td>431.7 (326.7-536.8)</td>
<td>1.17</td>
</tr>
<tr>
<td>30-49</td>
<td>236.7 (270.2-303.2)</td>
<td>558.7 (392.5-724.8)</td>
<td>1.95</td>
</tr>
<tr>
<td>50-69</td>
<td>258.4 (241.5-275.2)</td>
<td>397.2 (319.3-475.1)</td>
<td>1.54</td>
</tr>
<tr>
<td>70+</td>
<td>203.0 (162.7-243.2)</td>
<td>170.4 (95.7-245.1)</td>
<td>0.84</td>
</tr>
<tr>
<td>Total</td>
<td>288.5 (276.7-300.3)</td>
<td>439.8 (369.5-510.0)</td>
<td>1.52</td>
</tr>
<tr>
<td><strong>SEIFA quintile</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (most disadvantaged)</td>
<td>457.8 (421.7-493.9)</td>
<td>649.7 (470.6-828.9)</td>
<td>1.42</td>
</tr>
<tr>
<td>2</td>
<td>450.4 (420.2-480.5)</td>
<td>826.7 (571.2-1082.1)</td>
<td>1.83</td>
</tr>
<tr>
<td>3</td>
<td>465.9 (437.1-494.7)</td>
<td>668.3 (514.7-821.9)</td>
<td>1.43</td>
</tr>
<tr>
<td>4</td>
<td>447.0 (421.1-472.8)</td>
<td>710.0 (601.0-819.0)</td>
<td>1.59</td>
</tr>
<tr>
<td>5 (least disadvantaged)</td>
<td>476.2 (450.9-501.4)</td>
<td>613.6 (532.6-694.6)</td>
<td>1.30</td>
</tr>
</tbody>
</table>

a – Socio Economic Index for Areas
Table 4 – Volume of alcohol reported by the National Drug Strategy Household Survey (NDSHS) and the Australian International Alcohol Control Study (IAC), by drinking pattern

<table>
<thead>
<tr>
<th></th>
<th>NDSHS</th>
<th>IAC</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low risk drinkers&lt;sup&gt;a&lt;/sup&gt;</td>
<td>197.1 (191.8-202.6)</td>
<td>418.2 (315.4-521.0)</td>
<td>1.97</td>
</tr>
<tr>
<td>Risky drinkers&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1103.0 (1074.4-1131.6)</td>
<td>1626.5 (1520.0-1733.0)</td>
<td>1.47</td>
</tr>
</tbody>
</table>

<sup>a</sup> – Respondents who drink alcohol and report fewer than 12 5+ drinking occasions in the last year

<sup>b</sup> – Respondents who report 12 or more 5+ drinking occasions in the last year