Per capita alcohol consumption in Australia: will the real trend please step forward?

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ABSTRACT

Objective: To estimate the national trend in per capita consumption (PCC) of alcohol for Australians aged 15 years and older for the financial years 1990–91 to 2008–09.

Design and setting: With the use of data obtained from Australian Bureau of Statistics' catalogues and World Advertising Research Centre reports, three alternative series of annual totals of PCC of alcohol for the past 20 years (1990–91 to 2008–09) were estimated based on different assumptions about the alcohol content of wine. For the "old" series, the alcohol content of wine was assumed to have been stable over time. For the "new" series, the alcohol content of wine was assumed to have increased once in 2004–05 and then to have remained stable to 2008–09. For the "adjusted" series, the alcohol content of wine was assumed to have gradually increased over time, beginning in 1998–99. Linear trend analysis was applied to identify significant trends.

Main outcomes measure: National trend in annual PCC of alcohol 1990–91 to 2008–09.

Results: The new and adjusted series of annual totals of PCC of alcohol showed increasing trends; the old series was stable.

Conclusions: Until recently, official national annual totals of PCC of alcohol were underestimated and led to the mistaken impression that levels of alcohol consumption had been stable since the early 1990s. In fact, Australia's total PCC has been increasing significantly over time because of a gradual increase in the alcohol content and market share of wine and is now at one of its highest points since 1991–92. This new information is consistent with evidence of increasing alcohol-related harm and highlights the need for timely and accurate data on alcohol sales and harms across Australia.

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Over the past decade or more, Australian researchers have documented the adverse health and social effects of the increased availability of alcohol arising from the liberalisation of state liquor licensing.[1-3] Concern about rising alcohol-related hospitalisations,[4] alcohol-related liver disease[5] and increased social and economic costs[6,7] prompted the national Preventative Health Taskforce to propose increased taxation and reduced promotion of alcohol products.[6] The cost of alcohol-related harms to Australian society, including harms experienced by drinkers and "victims" of other peoples' drinking, is substantial,[6,7] with almost 75% of adult Australians having been adversely affected by someone else's drinking.[7]

Increasing adverse effects of alcohol use are usually accompanied by increased alcohol consumption in the population (traditionally expressed as litres of alcohol per capita for persons 15 years and older). However, until its most recent report,[8] the Australian Bureau of Statistics (ABS) indicated that per capita consumption (PCC) of pure alcohol among Australians aged 15 years and older had remained relatively steady since the mid-1990s.[9-12]

The ABS makes annual estimates of PCC of alcohol based largely on import clearance, excise, domestic alcohol sales data and surveys of winegrowers. Despite changes in the market share of different beverage types favouring wine (eg, an increase in the market share of wine from about 25% in the early 1990s to around 35% now), PCC estimates for wine were based on the assumption that the alcohol contents of the dominant types of table wine (ie, still red and white wine) remained unchanged over the past 20 years.[13-16] Consequently, the average alcohol content for all wines combined was estimated at about 11.2%, with minor year-to-year variations depending on the market share of different wine types.

In Australia, and in the United States,[17] the alcohol content of table wine has gradually increased since the late 1980s because winemakers have increasingly used highly ripened fruit to give a richer flavour to wine. This practice produces more alcohol during fermentation.[18] The latest ABS estimates (ie, for the financial year 2008–09) take account, for the first time, of the increasing alcohol content of wine over time.[8,19]

These new estimates incorporate more accurate assessments of the current alcohol content of white (12.2%) and red wine (13.4%), which effectively increase the estimated mean alcohol content for all wines to about 12.7%. Taking this into account, the ABS has also reissued corrected PCC estimates for the financial years 2004–05 to 2008–09.[8] In this report, we produce corrected estimates of PCC of alcohol in Australia for the past 19 years (financial years 1990–91 to 2008–09).

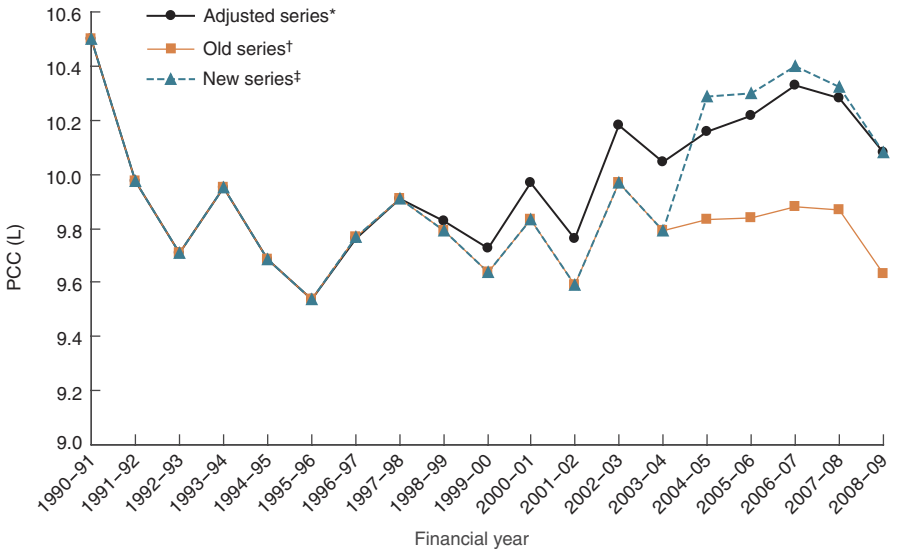
METHODS

Sources of alcohol sales data

We obtained annual financial-year estimates of volumes of apparent alcohol consumed and PCC (≥ 15 years of age) between 1996–97 and 2008–09 from the ABS. The ABS collects data on alcoholic beverage supply volumes in all jurisdictions nationwide.[19] For beer and spirits (including ready-to-drink spirits), data are directly derived from tax excise and customs data (estimates of amounts of home-produced beer are added). Excise tax data (which provide direct information on pure alcohol volumes for beer and spirits) are not available for wine, which is taxed using an ad valorem (in proportion to value) approach. Estimates of total volumes of supplied wine (ie, not pure alcohol) are derived from surveys of winemakers, customs import data, and an allowance for home production. To estimate the PCC of wine, the ABS combines total volumes of supplied wine with estimates of the mean pure alcohol content for the various types of wine-based beverages. The ABS PCC estimates do not include data for consumption of cider-based beverages,[19] which is likely to be relatively small.

We obtained Australian alcohol consumption estimates for 1990–91 to 1995–96 from the 2004 report of the World Advertising Research Centre (WARC), a

1 Comparison of alternative estimates of annual per capita consumption (PCC) of pure alcohol in litres for Australians aged ⩾ 15 years, 1990–91 to 2008–09



* For the adjusted series, the alcohol content of wine was assumed to have gradually increased over time, beginning in 1998–99. † For the old series, the alcohol content of wine was assumed to have been stable over time. ‡ For the new series, the alcohol content of wine was assumed to have increased once in 2004–05 and then to have remained stable to 2008–09. ◆

source of reliable historical data on PCC of alcohol for over 40 countries.[20] WARC sourced the Australian estimates from the ABS, with data on spirits supplemented by the Distilled Spirits Industry Council of Australia. Annual totals of PCC in the WARC report were based on total estimated residential population (ERP); we converted these totals to PCC of alcohol for the population aged 15 years and more using the ABS's annual ERP for each year to ensure that they conformed to the ABS's PCC estimates.

Mean percentage of pure alcohol content by volume for wine

We compared the mean percentages of pure alcohol content by volume (PACV) for wine that were used by the ABS before 2010 ("old" estimates) with the mean percentages of PACV used in the ABS's most recently released catalogues ("new" estimates). The old estimates were: table wine (red and white still wine) 10.8%; sparkling and carbonated 10.6%; fortified 17.9%; vermouth 17.3%; and "other" 14.4%.[13-16] The new estimates were: still red and white table wine 13.4% and 12.2%, respectively; sparkling and carbonated 11.2%; fortified 17.9%; vermouth 16.4%; and "other" 14.4%.[19]

Using ABS publications, we estimated the mean percentage of PACV for all wine-based beverages sold (ie, taking into account market share of different wine types) by dividing total "litres of wine" into "litres of pure alcohol" sold as wine (ie, total litres pure alcohol/total litres wine).

National per capita consumption estimates, 1990–91 to 2008–09

To estimate the annual national total PCC of alcohol for Australians ⩾ 15 years of age from 1990–91 to 2008–09, we made three different assumptions about percentage PACV for wine; for beer and spirits, we used the annual beer and spirits PCC estimates of the ABS without any adjustment. All our estimates were based on the same annual volumes of consumption provided by the ABS. Where these had been revised in later publications, the most recent estimates were applied.

We derived the first of the three alternative series of national annual PCC of alcohol sold as wine ("old" series) by basing the national PCC on the old wine mean percentage of PACV for the whole series. This series consists of the annual totals of alcohol PCC published by the ABS before 2010. The old wine mean percentage of PACV was also applied to the PCC total for 2008–09 (the total most recently published) to demonstrate how the series would have appeared had the updated PACV percentages not been used.

For the second series ("new" series), the national annual PCC totals were based on the old wine mean percentages of PACV for 1990–91 to 2003–04 and the new wine mean percentages of PACV for 2004–05 to 2008–09. This series shows how the trend in PCC appears when the latest ABS PCC estimates[8] (which date back only to 2004–05) are brought together with the ABS estimates for the earlier years.

We based the third series ("adjusted" series) of national annual PCC on the old wine mean percentages of PACV for 1990–91 to 1997–98 and the annually adjusted mean percentages of PACV for 1998–99 to 2008–09. Instead of showing, as the new series does, that the alcohol content of all wine increased abruptly in 2004–05, this series shows the change in percentage of PACV for all wine to be equally apportioned on an annual basis. We chose 1998–99 as the year to begin the incremental increase in mean percentages of PACV for wine because Kerr and colleagues[17] show that the alcohol content of table wine in the US began its gradual increase around this time.

Linear trend estimates were produced for each series by individually regressing them on a time function starting from 1991–92. These were fitted using the curve estimation procedure of the software package PASW Statistics 17.0 (SPSS Inc, Chicago, Ill, USA).

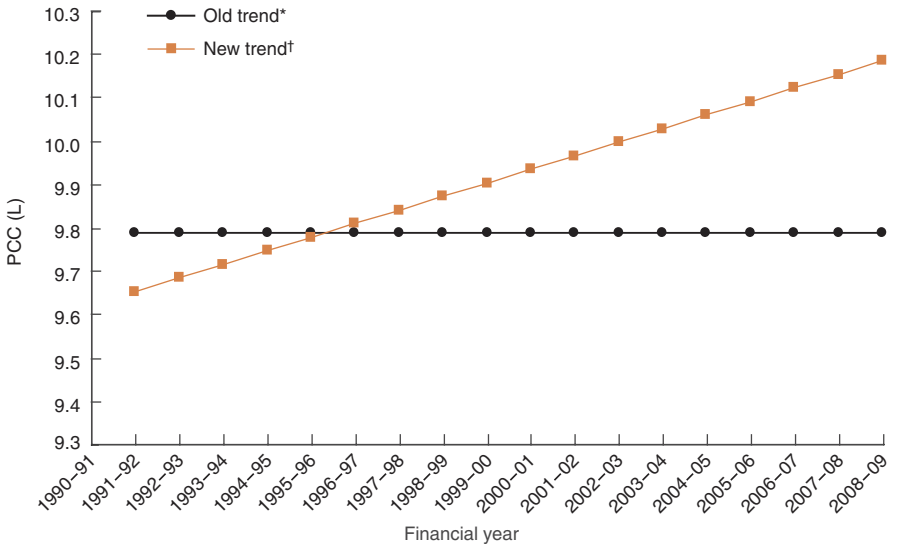
RESULTS

Using the old wine PACV estimates and taking into account the market share across the different wine-based beverages, we estimated the mean percentage of PACV for all wine sold in 1996–97 to be 11.4%. In 2008–09, based on the new percentage PACV wine estimates, the mean percentage of PACV for all wine sold was 12.7%.

As Box 1 shows, on the old assumptions of PACV percentages for wine, annual estimates of PCC of alcohol varied between about 9.6 and 10.0 litres, with the exception of a high point in 1990–91 of 10.5 litres. Had the PACV percentage for wine not been updated in 2010 (for table wines in particular), the 2008–09 PCC of alcohol would have apparently declined to one of its lowest points in almost two decades.

The new ABS PCC estimates give the impression that alcohol consumption rose sharply in 2004–05. However, it is more likely that the increase in the PACV percentage of wine occurred steadily over the past decade or so.[17] When the change in total wine alcohol content (from 11.4% in 1998–99 to 12.7% in 2008–09) is evenly appor-

2 Linear trends (line of best fit) for alternative estimates of annual per capita consumption (PCC) of pure alcohol in litres for Australians aged ⩾ 15 years, 1991–92 to 2008–09



* The series of annual PCC of alcohol on which the old trend is based was derived from underestimated alcohol contents of wine. † The series of annual PCC of alcohol on which the new trend is based was derived from revised alcohol contents of wine. ◆

tioned to each year from 1998–99 onwards, a more gradual increasing trend results. We found a gradual increase from year to year of about 1%.

Box 2 shows the linear trends for the old and new series of national annual PCC of alcohol from 1991–92 (the adjusted series trend was similar to the new series and has not been shown). These indicate the lines of best fit and describe the relative direction and slope of the actual underlying trends in PCC. Both the adjusted ($t = 4.22$; $P < 0.001$) and new series ($t = 3.23$; $P < 0.005$) indicate significant positive trends, whereas the old series was stable ($t = -0.010$, statistically non-significant).

DISCUSSION

Until 2010, official estimates of PCC of alcohol in Australia have been consistent underestimates. Debates about Australian alcohol policy has accordingly been conducted on the mistaken assumption that PCC remained stable for over a decade, when in fact it has steadily increased.

Alcohol consumption in Australia is now at one of its highest points since 1991–92 and probably would have been higher if not for the impact of an increase in April 2008 of excise tax on ready-to-drink spirit-based products ("alcopops tax").[21,22] The PCC in 2008–09 reflects the effects of the alcopops tax. If not for the large fall in premixed beverage sales in 2008–09,[8] which was only partially offset by an increase in "straight" spirit consumption,[1] national PCC of alcohol in 2008–09 would probably have exceeded 10.2 litres per person aged 15 years or more (given that wine and beer consumption in 2008–09 was similar to that in the previous year).

The increased PCC of alcohol makes sense of what had seemed until now the anomalous stability of alcohol consumption in the face of increased alcohol-related hospitalisations for injury[4] and liver disease,[5] as well as apparent increased community concern about alcohol-related problems.[1,23]

As several of us have argued earlier,[6,24] it is essential that alcohol policy is informed by sound data on alcohol use and alcohol-related harm in the Australian population. The former should include both credible estimates of PCC of alcohol derived from alcohol sales data and well conducted population surveys of drinking patterns.[25] National sales data are essential for monitoring trends in the PCC of alcohol, facilitating rigorous examinations of the relationships between PCC of alcohol and population health outcomes (eg, liver cirrhosis, accidents and suicide rates), as well as social harms (eg, arrests for assault and public disorder).[24-26] Ideally, state and territory alcohol sales data should be used to estimate the sales volumes of each beverage type at local levels. Local sales data can be used to evaluate the effectiveness of community initiatives to reduce alcohol-related harm such as changes in liquor licensing, pub "lock outs" and restrictions on types of alcohol that can be sold in rural and remote communities.

Key actions to reduce the preventable harms from alcohol are outlined in the National Preventative Health Strategy (the Strategy)[6] — the fact that the real PCC of alcohol has been significantly and steadily increasing in Australia in recent times should encourage the adoption of these and the Strategy's other evidence-based recommendations related to alcohol consumption.

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COMPETING INTERESTS

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