

Regional variation in alcohol consumption in the Northern Territory

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Excessive consumption of alcohol continues to be a major public health problem in Australia.¹ For the country as a whole, annual mean consumption of pure alcohol is estimated to be 9.67 litres per person aged ≥ 15 years.² However, there is considerable variation in consumption patterns, including consumption levels, types of beverage consumed and the temporal pattern of consumption. This paper aims to describe some of that variation in the Northern Territory (NT).

Recent articles have highlighted the limitations of approaches that focus solely on per capita consumption as an indicator of harmful consumption and on intervention strategies that simply aim to reduce aggregate levels of consumption.³⁻⁵ Nevertheless, where other data are not available, per capita consumption remains an important crude indicator of use that is generally well correlated with measures of harm.^{6,7}

On this measure, it has long been known that alcohol consumption in the NT is considerably greater than in Australia as a whole. In recognition of this, in April 1992, the NT Government introduced a levy on the sale of all alcoholic beverages and, in July 1995, introduced an additional levy on the sale of cask wine. The purpose of these levies – which, along with other State and Territory liquor licensing fees, were declared unconstitutional by the High Court in August 1997 – was to fund the NT's 'Living with Alcohol' program. This program was a major public health initiative aimed at reducing alcohol-related harm. Despite the positive impact of both the levies themselves and the

'Living with Alcohol' program, per capita consumption remains high.^{8,9} In this context, there is currently a vigorous debate within the NT on both the nature of 'the alcohol problem' and measures to address it.

Unfortunately, much of this debate has been conducted in the absence of basic descriptive epidemiological data. For example, while there is some evidence of regional variation, little published data is available, and in various public forums widely conflicting claims have been made regarding consumption levels. In the same forums, again in the absence of real evidence, it has been claimed that 'the problem' is simply an 'Aboriginal problem'. This paper contributes to this debate by seeking to identify any regional variation in per capita consumption of pure alcohol and the types of beverages consumed; and to estimate the relative contributions to consumption by Aboriginal and non-Aboriginal people.

Methods

The Northern Territory Liquor Commission provided quarterly data on wholesale purchases of alcohol by licensees, by beverage type, by Australian Bureau of Statistics' statistical sub-division (SSD) for the period 1 July 1994 to 30 June 1998 – the beginning of this period coinciding with the establishment of the Commission's current method of data collection. Data on the volume of each beverage type purchased were converted to estimates of pure alcohol content using methods reported on elsewhere and used as a proxy measure of consumption.¹⁰

Abstract

Objective: To identify any regional variation in per capita consumption of alcohol and the types of beverages consumed in the NT; and to estimate the relative contributions to consumption by Aboriginal and non-Aboriginal people.

Method: Per capita consumption estimates were based on wholesale purchases of alcohol by licensee and Census population data. Mean levels and the percentages of each beverage type consumed were compared between regions and through time. Estimates of per capita levels of consumption between Aboriginal and non-Aboriginal segments of the population were based on reports of the proportion of frequent and occasional drinkers in each group and the ratio of consumption among Aboriginal and non-Aboriginal drinkers.

Results: Mean quarterly per capita consumption was higher in both the Lower Top End (4.22 litres) and the Central NT (4.04 litres), and less in the Barkly (3.44 litres) than in the Top End (3.55 litres). Over the four-year period, consumption in the Top End rose 6.4%, but dropped 22.5% in the Barkly. In the Lower Top End and the Central NT a larger percentage of alcohol was consumed as cask wine than in the Top End. Before licensing restrictions were introduced, this was also the case in the Barkly. In the NT, per capita consumption among Aboriginal people is approximately 1.97 times, and among non-Aboriginal people about 1.43 times, the national average.

Conclusions: Alcohol consumption in the NT is greater than in Australia as a whole and there is significant regional variation. The problem is not simply an Aboriginal problem, and a broad range of strategies – including a component to address regional variation – is required to reduce it.

(*Aust N Z J Public Health* 1999; 24: 35-8)

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Submitted: May 1999

Revision requested: August 1999

Accepted: October 1999

For the purpose of comparison, four regions were delineated. These are:

- Top End, consisting of the Darwin Statistical Division and the Darwin Rural Areas, Bathurst-Melville, Daly, Alligator, and East Arnhem SSDs;
- Lower Top End SSD, centred on Katherine;
- Barkly SSD, centred on Tennant Creek; and
- Central NT SSD, centred on Alice Springs.

Quarterly per capita levels of consumption of each beverage type were calculated for each region. Population denominators were based on the total counts of persons aged ≥15 years in each statistical sub-division at the 1991 and 1996 Censuses of Population and Housing with extrapolations for non-Census quarters based on the rate of change between the two Censuses. Total counts were used, rather than visitor-adjusted estimates of usual resident population because the data necessary to adjust for an Aboriginal component were not available. However, because the time of the Census coincided with the peak in the tourist season, use of the total count provided a conservative estimate of per capita consumption that does not vary greatly from the visitor-adjusted estimates of population.

Data were analysed using SPSS 6.1. Several independent t-tests for the equality of means were used to compare mean quarterly levels of pure alcohol consumption between the Top End (where about 65% of the NT's population resides) and each of the other regions. Durban Watson statistics for the measures of consumption revealed no evidence of significant auto-correlation, thus allowing the application of multiple linear regression to examine trends over time. Seasonal factors in each series reflected peak tourist seasons occurring between July and September and consumption variables were de-seasonalised prior to analysis. Multiple linear regression was used to test for trends in quarterly levels of per capita consumption. Direct comparison was made between the percentage contribution that each beverage type made to quarterly per capita consumption in each region.

Estimates of per capita consumption among Aboriginal and non-Aboriginal populations were made on the assumption – based on national survey data – that 62% of the Aboriginal population and 72% of the non-Aboriginal populations are either regular or occasional drinkers.^{11,12} In rural areas of the NT the proportion is actually lower, so Aboriginal consumption is likely to be over-estimated to some extent.¹³ An estimate of the ratio of alcohol consumed by Aboriginal to non-Aboriginal drinkers of 1.6:1 was based on two sources that provided similar results. The first was regression modelling of data from a 1995 survey by the Health Department of Western Australia.³ The second was unpublished findings from two surveys conducted by Peter d'Abbs and his colleagues from the Menzies School of Health Research. These latter surveys were conducted in the West Kimberley region of Western Australia (a region similar in many respects to much of the NT) and it was found that in the week prior to interview the median consumption of alcohol by Aboriginal drinkers (n=194) was 237.9 mL, and of non-Aboriginal drinkers (n=1,826) was 148.2 mL – a ratio of 1.6:1 (d'Abbs personal communication).

Estimates of Aboriginal and non-Aboriginal per capita consumption of pure alcohol for each quarter were calculated using the formula:

$$AC + nAC = TC$$

$$[(Ap * Ad) * (r * nAdc)] + [(nAp * nAd * nAdc)] = TC$$

where

AC = Aboriginal consumption

nAC = non-Aboriginal consumption

TC = total consumption

Ap = estimated Aboriginal population

Ad = proportion of the Aboriginal population that consumes alcohol

r = ratio of Aboriginal to non-Aboriginal per capita consumption

nAp = estimated non-Aboriginal population

nAd = proportion of the non-Aboriginal population that consumes alcohol

nAdc = per capita consumption of pure alcohol among non-Aboriginal drinkers, and

$$nAdc = TC / [(Ap * Ad * r) + (nAp * nAd)]$$

Results

During the four-year period in the Top End, mean quarterly per capita consumption of pure alcohol among those aged ≥15 years was 3.55 litres (14.2 litres per year). Per capita consumption in the Lower Top End was 18.9% higher, and was 13.8% higher in the Central NT (Table 1). That there was no significant difference between the Barkly and the Top End is a consequence of the averaging out of a higher level of consumption in the Barkly in 1994–95 and a fall to a significantly lower level in 1997–98. For comparative purposes, mean consumption is summarised on an annual basis in Table 2.

In all regions, there was a drop in per capita consumption between 1994/95 and 1995/96 (Table 2). With the exception of

Table 1: Mean quarterly per capita consumption of pure alcohol by region, Northern Territory, 1/7/94 to 30/6/98.

Region	Mean	SD	SE of mean	t	df	Sig
Top End	3.55	0.431	0.108	–	–	–
Lower Top End	4.22	0.624	0.156	-3.52	30	0.001
Barkly	3.44	0.484	0.121	0.70	30	0.491
Central NT	4.04	0.366	0.091	-3.41	30	0.002

Table 2: Annual per capita consumption of pure alcohol by region, Northern Territory, 1994/95 to 1997/98.

Region	1994/95	1995/96	1996/97	1997/98
Top End	14.02	13.71	14.20	14.92
Lower Top End	17.67	15.85	17.00	17.03
Barkly	16.10	13.86	12.61	12.47
Central NT	16.55	15.60	15.99	16.44
Northern Territory	14.98	14.32	14.79	15.37

Table 3: Variation in trends associated with regional per capita consumption of pure alcohol.

Region	Model Adj R ²	Stdzd B coeff	B estimate	95% CI for B	t	Sig
Top End	0.344	0.623	0.020	0.006 to 0.035	2.978	0.010
Lower Top End	0.000	-0.026	-0.001	-0.033 to 0.030	-0.096	0.952
Barkly	0.760	-0.881	-0.078	-0.102 to -0.054	-6.973	0.000
Central NT	0.000	0.122	0.004	-0.016 to 0.025	0.458	0.654
Northern Territory	0.088	0.387	0.012	-0.004 to 0.028	1.569	0.139

the Top End, this reduction was sustained in 1996/97. However, in 1997/98, in all regions but the Barkly, consumption returned to levels similar to, or higher than, those in 1994/95. Despite the reduction in 1995/96 and 1996/97, in the Lower Top End and the Central NT – apart from seasonal variation – trends in the level of per capita consumption remained relatively constant (see Table 3). However, in the Top End on a seasonally adjusted basis there was an increase in consumption of 6.4%; and in the Barkly there was a decline of 22.5% in annual per capita consumption from 16.10 to 12.47 litres per person aged ≥ 15 years.

On a mean quarterly per capita basis, in the Top End most alcohol was consumed as full strength beer (46%), followed by spirits (15%), low-strength beer (13%), cask wine (11%) and bottled wine (9%). None of the other categories of beverage (full-strength cider, fortified wine, mixed spirits and low-alcohol cider) exceeded 2%.

When compared with the Top End, in the other regions, more alcohol was consumed as cask wine and less as low-strength beer. This was most marked in the Central NT, where cask wine consumption was double, and low-strength beer almost half, that in the Top End. While, in the Lower Top End and the Barkly, the percentage of alcohol sold as cask wine was not as high as that in the Central NT, the percentage of alcohol sold as full-strength beer was greater.

The figures on mean per capita consumption by beverage type conceal some variation. In the Barkly Region, in 1994/95, the proportion of alcohol sold as cask wine was the highest in the NT (28.4%) but in 1997/98 was the lowest (9.6%). In the Top End, Lower Top End and Central NT in the 1995/96 and 1996/97 financial years, less alcohol was sold as cask wine than in the

previous and subsequent years. In fact, in the NT as a whole, this reduction in cask wine sales led to a seasonally adjusted decline in mean quarterly consumption of all alcohol of 4% ($t=-2.625$ $p=0.020$) during this period.

Estimates of the range of per capita consumption among Aboriginal and non-Aboriginal people aged ≥ 15 years for each region for the four year period 1994/95 to 1997/98 are presented in Table 5. Per capita consumption among Aboriginal people in the NT as a whole was 1.97 times, and among non-Aboriginal people was 1.43 times, the national average. Consumption among both Aboriginal and non-Aboriginal people in both the Lower Top End and the Central NT was considerably higher than these estimates. Even in the Barkly – where per capita consumption was the lowest in the NT – Aboriginal consumption was 1.70 times and non-Aboriginal consumption 1.23 times the national average.

Discussion

Throughout the NT per capita consumption of pure alcohol is considerably greater than in Australia as a whole. However, the results of this study indicate that even within the NT there is considerable variation, with levels of consumption being significantly higher in the Lower Top End and the Central NT than in the Top End. The results also indicate that, during the period under consideration, there was some temporal variation. This has three components: a 4% overall reduction in consumption in the 1995/96 to 1996/97 period; a reduction of 22.5% in the Barkly; and, an increase in consumption of 6.4% in the Top End. Elsewhere, we have shown that the first component was associated with the imposition of the NT Government's cask wine levy.⁹ This levy had most effect in the Lower Top End and Central NT regions. In the Top End, where less alcohol is consumed as cask wine, the levy

Table 4: Mean quarterly per capita consumption of pure alcohol by beverage type by region, Northern Territory, 1994/95 to 1997/98.

Region	Beer full strength	Beer low strength	Wine cask	Wine bottled	Spirits	Other
Top End	1.64 (46%)	0.47 (13%)	0.39 (11%)	0.31 (9%)	0.55 (15%)	0.19 (5%)
Lower Top End	2.33 (55%)	0.48 (11%)	0.69 (16%)	0.13 (3%)	0.44 (10%)	0.15 (4%)
Barkly	1.93 (56%)	0.29 (8%)	0.52 (15%)	0.10 (3%)	0.40 (12%)	0.21 (6%)
Central NT	1.82 (45%)	0.30 (7%)	0.91 (23%)	0.34 (8%)	0.49 (12%)	0.18 (4%)

Table 5: Estimates of mean annual per capita consumption of pure alcohol by Aboriginality, Northern Territory, 1994/95 to 1997/98.

Region	Aboriginal	Non-Aboriginal
Top End	18.50	13.42
Lower Top End	21.01	15.25
Barkly	16.45	11.94
Central NT	20.26	14.70
Northern Territory	19.05	13.83

was apparently less effective. In the Barkly, the cask wine levy also had less effect. In this case, however, it was because – about the same time the levy was introduced – licensing restrictions were imposed which, among other things, banned the sale of wine in casks of >2 litres. It was these licensing restrictions that accounted for the second component of the temporal variation described above.¹⁰ With regard to the third component, it is not clear what caused the increase in consumption in the Top End, and this requires further investigation.

The significant regional variation in per capita consumption is associated with variation in the types of beverages most frequently consumed. In the Lower Top End and the Central NT, a higher proportion of alcohol is consumed as cask wine and in the Lower Top End as full-strength beer – a pattern similar to that in the Barkly before the introduction of the Tennant Creek licensing restrictions. In part, it would appear that this pattern is associated with the higher percentages of impoverished Aboriginal people living in these regions (approximately 29, 43 and 25% respectively in the Lower Top End, Barkly and Central NT compared with 16% in the Top End). Our own observations and those of others suggest that Aboriginal people in such circumstances often seek to buy high-alcohol, low-price beverages – of which cask wine is the best example.¹⁴

In part, the estimates of per capita consumption among Aboriginal and non-Aboriginal people highlight what has already been well documented. That is, among some sections of the Aboriginal population consumption levels and associated harm are extremely high. However, these estimates clearly indicate that the problem of excessive alcohol consumption is not confined to the Aboriginal population. Consumption levels among non-Aboriginal people in the NT as a whole are estimated to be 43% greater than among Australians as a whole. Thus, even if some magic solution was found to reduce the harmful levels of consumption among Aboriginal people, the NT would still have a significant alcohol problem.

The results of the study indicate that there is a need for renewed effort to reduce per capita levels of alcohol consumption in the NT. Studies from both Australia and abroad make it clear that there is no one simple solution to problems of excessive alcohol consumption.¹⁵⁻¹⁷ While the impact of the NT Government's cask levy and the Tennant Creek liquor licensing restrictions provide some indication of measures that can be effective, the solution to the problem of excessive alcohol consumption in the NT requires a broad range of strategies. These should include both 'broad brush' strategies that aim to reduce aggregate consumption and strategies that focus on high-risk consumption and drinking situations.¹⁸ Importantly, such strategies need to include a component that addresses the regional variations in consumption identified in this study.

Acknowledgments

The Northern Territory Liquor Commission provided us with alcohol purchase data and valuable help in classifying and formatting the data. Mike Phillips, Tim Stockwell, David Atkinson and Peter d'Abbs provided comments during the preparation of the paper. The National Drug Research Institute is funded as part of the National Drug Strategy. An earlier version of this paper was presented in Alice Springs at a forum sponsored by Central Australians for Reconciliation.

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