

Curtin

UNIVERSITY OF TECHNOLOGY

National Drug Research Institute

Preventing harmful drug use in Australia

**The Impact of Restrictions
on the Sale of Alcohol
on Particular Days of the
Week: With Reference to
Proposed Restrictions in
Port Hedland and South
Hedland**

Formerly National Centre for Research into the Prevention of Drug Abuse

FUNDED BY THE NATIONAL DRUG STRATEGY



**The impact of restrictions on the sale of alcohol on
particular days of the week:
with reference to proposed restrictions in
Port Hedland and South Hedland**

**A Report to the Director of Liquor Licensing
Western Australia**

Dennis Gray MPH PhD

**National Drug Research Institute
Curtin University of Technology**

28 January 2003

Name:

Dennis Arthur Gray

Date of birth:

3rd March 1947

Occupation:

Associate Professor (Medical Anthropology) and Deputy Director
National Drug Research Institute
Curtin University of Technology

Employment History

1992 to present

Manager, Indigenous Australian Research Program
National Drug Research Institute
Curtin University of Technology

1990-92

Principal Policy Officer
Aboriginal Affairs Planning Authority

1984-90

Senior Lecturer—Coordinator and Director
Community Health Research & Training Unit
Department of General Practice
The University of Western Australia

Qualifications and experience

Bachelor of Arts (Anthropology & History) The University of Western Australia

Master of Arts (Anthropology) The University of Western Australia

Master of Public Health (International Health) The University of Hawaii

Doctor of Philosophy (Anthropology) The University of Hawaii

I have worked as a researcher, teacher, and practitioner in the public health field for the past 25 years. In the research area, I have focused on Aboriginal health issues and am co-author of a widely used text book on Aboriginal health. Over the past six years, I have established and managed the Indigenous Australian Research Program at the National Drug Research Institute at Curtin University of Technology—a 'centre of excellence' funded by the National Drug Strategy, and a World Health Organisation Collaborating Centre. In that position, with various colleagues, I have: written a book on comparative alcohol use among indigenous people in Australia, New Zealand, and Canada; documented patterns of alcohol and other drug use among young Aboriginal people; been involved in the evaluation of alcohol and other drug intervention projects; and, conducted research on liquor licensing laws, licensing restrictions and their effects on Aboriginal people. The work I have undertaken among Aboriginal people has required wide reading of the general literature on alcohol. In addition to work among

Aboriginal people, I have also conducted research on more general alcohol issues including: evaluation of the effectiveness of liquor licensing restrictions in Tennant Creek; the effect of a levy on cask wine in the Northern Territory; and, regional variation in the consumption of alcohol in the Northern Territory.

Relevant Publications

Books

Gray D, Siggers S (eds). *Indigenous Australian Alcohol and Other Drug Issues: Research from the National Drug Research Institute*. Perth: National Drug Research Institute, 2002.

Siggers S, Gray D. *Dealing with Alcohol: Indigenous Usage in Australia, New Zealand and Canada*. Melbourne: Cambridge University Press, 1998.

Siggers S, Gray D. *Aboriginal Health and Society: The Traditional and Contemporary Aboriginal Struggle for Better Health*. Sydney: Allen & Unwin, 1991.

Refereed journal articles and book chapters

Gray D, Sputore B, Stearne A, Bourbon D, Stempel P. *Indigenous Drug and Alcohol Projects: 1999–2000*. ANCD Research Paper 4. Canberra: Australian National Council on Drugs, 2002.

Gray D, Siggers S. Indigenous health: the perpetuation of inequality. In Germov J (ed) *Second Opinion: An Introduction to Health Sociology* (2nd edn). Melbourne: Oxford University Press, 2002; 57–74.

Siggers S, Gray D. Theorising Indigenous health: a political economy of health and substance misuse. *Health Sociology Review* 2002; 10 (2): 21–32.

Gray D. Indigenous Australians and liquor licensing restrictions (invited and refereed editorial) *Addiction* 2000; 95: 1469–1472.

Gray D, Siggers S, Sputore B, Bourbon D. What works? a review of evaluated alcohol misuse interventions among Aboriginal Australians. *Addiction* 2000; 95(1): 11–22.

Gray D, Chikritzhs T. Regional variation in alcohol consumption in the Northern Territory. *Australian and New Zealand Journal of Public Health* 2000; 24(1): 35–38.

Gray D, Chikritzhs T, Stockwell T. The Northern Territory's cask wine levy: health and taxation policy implications. *Australian and New Zealand Journal of Public Health* 1999; 23(6): 87–89.

Gray D, Sputore B, Walker J. Evaluation of an Aboriginal health promotion program: a case study from Karalundi. *Health Promotion Journal of Australia* 1998; 8(1): 24–28.

Siggers S, Gray D. Alcohol in indigenous Australian communities. In Waddell C, Petersen A (eds) *Health Matters*. Sydney: Allen & Unwin 1998; Ch 20: 320–335.

Siggers S, Gray D. Supplying and promoting 'grog': the political economy of alcohol in Aboriginal Australia. *Australian Journal of Social Issues* 1997; 32(3): 215–237.

- Gray D, Morfitt B, Ryan K, Williams S. The use of tobacco, alcohol and other drugs by young Aboriginal people in Albany. *Australian and New Zealand Journal of Public Health* 1997; 21(1): 71–76.
- Gray D. Harm reduction and self-determination. Invited comment on: The prospects of a harm reduction approach among indigenous people in Canada. *Drug and Alcohol Review* 1996; 15(4): 409–410.
- Gray D, Sagggers S, Drandich M, Wallam D, Plowright P. Evaluating government health and substance abuse programs for indigenous peoples: a comparative review. *Australian Journal of Public Health* 1995; 19(6): 567–572.
- Gray D, Drandich M, Moore L, Wilkes T, Riley R, Davies S. Aboriginal well-being and liquor licensing legislation in Western Australia. *Australian Journal of Public Health* 1995; 19(2): 177–185.
- Sagggers S, Gray D. Health policy. In *Encyclopaedia of Aboriginal Australia*. Aboriginal Studies Press: Canberra, 1994; 461–462
- Gray D, Sagggers S. Aboriginal health: the harvest of injustice. In Waddell C, Petersen A (eds) *Just Health*. Churchill Livingstone: Melbourne, 1994; 119–133.
- Sagggers S, Gray D. Policy and practice in Aboriginal health. In Reid J, Trompf P (eds) *The Health of Aboriginal Australia*. Sydney: Harcourt, Brace, Jovanovich, 1991; 9: 381–420.

Technical reports

- Gray D, Sagggers S, Atkinson D, Carter M, Loxley W, Hayward D. *The Harm Reduction Needs of Aboriginal People Who Inject Drugs*. Perth: National Drug Research Institute, Curtin University, September 2001
- Sagggers S, Gray D, (with assistance from Paul Catalano). *Port Hedland and Roebourne Substance Misuse Services Review*. Perth: National Drug Research Institute, Curtin University of Technology, June 2000.
- Sputore B, Gray D, Sampi C. *Review of the Services Provided by Jungarni-Jutiya Alcohol Action Council Aboriginal Corporation*. Perth: National Drug Research Institute, Curtin University of Technology, February 2000.
- d'Abbs P, Gray D, Togni S, Wales, N, Fitz J, Chikritzhs T. *Alcohol-Related Problems in Katherine*. Darwin: Menzies School of Health Research, 1999.
- Gray D. *Alcohol consumption, related harm, and intervention measures in Kununurra, Western Australia*. Perth: National Centre for Research into the Prevention of Drug Abuse, August 1999.
- Bourbon D, Sagggers, S, Gray D. *Indigenous Australians and Liquor Licensing Related Legislation*. Perth: National Centre for Research into the Prevention of Drug Abuse, Curtin University of Technology, June 1999.
- Sagggers S, Gray D, Bourbon D, Parker R. *Local Level Supply and Promotion of Alcohol in Two Aboriginal Communities in Rural Western Australia*. Perth: National Centre for Research into the Prevention of Drug Abuse, Curtin University of Technology, September 1998.
- Gray D, Sagggers S, Atkinson D, Sputore B, Bourbon D. *Evaluation of the Tennant Creek Liquor Licensing Restrictions: A Report Prepared for the Tennant Creek Beat*

- the Grog Sub-Committee*. Perth: National Centre for Research into the Prevention of Drug Abuse, Curtin University of Technology, August 1998.
- Sputore B, Gray D, Bourbon D, Baird K. *Evaluation of Kununurra-Waringarri Aboriginal Corporation and Ngnowar-Aerwah Aboriginal Corporation's Alcohol Projects*. Perth: National Centre for Research into the Prevention of Drug Abuse, Curtin University of Technology, August 1998.
- Gray D, Morfitt B, Walker J. *Karalundi Peer Support and Skills Training Program Evaluation*. Perth: National Centre for Research into the Prevention of Drug Abuse, Curtin University of Technology & Karalundi Aboriginal Education Centre, March 1997.
- Morfitt-Sputore B, Gray D, Richardson C, Exon M. *National Data Base on Aboriginal and Torres Strait Islander Alcohol and Other Drug Projects* (for IBM compatible personal computers, includes 6 discs and User Manual). Perth: National Centre for Research into the Prevention of Drug Abuse, Curtin University of Technology, 1997.
- Morfitt B, Gray D. *A Preliminary Report on the Evaluation of the Kununurra-Waringarri Aboriginal Corporation's Alcohol Projects*. Perth: National Centre for Research into the Prevention of Drug Abuse, Curtin University of Technology, November 1996.
- Gray D, Morfitt B, Williams S, Ryan K, Coyne L. *Drug Use and Related Issues Among Young Aboriginal People in Albany*. Perth: National Centre for Research into the Prevention of Drug Abuse, Curtin University of Technology & Albany Aboriginal Corporation, November 1996.
- Gray D, Wallam D. *A Review of the Report of the Minister for Racing and Gaming on the Review of the Liquor Licensing Act 1988, June 1995: A Report prepared for the Aboriginal Justice Council*. Perth: National Centre for Research into the Prevention of Drug Abuse, Curtin University of Technology, September 1995.
- Gray D, Saggars S, Plowright P, Drandich M. *Monitoring and Evaluation Models for Indigenous Peoples: A Literature Review for the Western Australian Aboriginal Affairs Department*. National Centre for Research into the Prevention of Drug Abuse, Curtin University of Technology, Perth, April 1995.
- West R, Gray D, Murray R. *Kimberley Aboriginal Medical Services Review*. Perth: Aboriginal & Torres Strait Islander Commission, August 1994.
- Gray D, Drandich M. *Aboriginal Issues and the Liquor Licensing Act 1988*. Submission to the Review Committee Liquor Licensing Act 1988. Perth: National Centre for Research into the Prevention of Drug Abuse, Curtin University of Technology, 1993.
- Gray D, Atkinson D. *Review of Aboriginal Health Policy in Western Australia*. Perth: Health Department of Western Australia, 1990.

The impact of restrictions on the sale of alcohol on particular days of the week

This report has been prepared at the request of the Executive Director of Public Health, Western Australian Department of Health. The aim of the report is to review the evidence—both for and against—the likely effectiveness of the proposal by the Director of Liquor Licensing to restrict the package alcohol sales on Sundays in Port Hedland and South Hedland.

In a review of alcohol problems and alcohol availability, Gruenewald wrote:

...studies of the effects of changes in hours and days of sale are notable in the literature for their general absence' (1993:73).

Similarly, in a review conducted for the World Health Organisation, Edwards *et al.* (1994) identified only a small number of published reports on this topic. The only additional reports that I have been able to identify that have been published since these reviews are those evaluating partial restrictions on particular days of sale in Tennant Creek and Derby. All of these are reviewed below.

Impact of total restrictions on particular days

Olsson and Wikstrom (1982) reported on the evaluation of a trial of Saturday closing of alcohol retail outlets in Sweden between June and September 1981. From official statistics, they assembled time series data on various categories of variables. These categories of variables included alcohol consumption, detentions of intoxicated persons, interventions against intoxicated persons, domestic disturbances, public disturbances, crimes of violence, vandalism, domestic disturbances, acute medical care, and road accidents involving injuries. Some variables such as drink-driving offences were omitted because they were unreliably ascertained. Efforts were also made to identify variations in interventions and weather conditions that might have accounted for changes over time.

The variables were compared over the three month period of the trial with the corresponding three months in the previous year, and Tuesdays, Wednesdays and Thursdays were used as control days to assess the impact of developments unrelated to the intervention. Essentially, the impact of the trial was assessed in a six step process:

1. ascertainment of the number of 'cases' for each variable, in the trial period of June–September 1981;
2. ascertainment of the number of 'cases' for each of the variables for the period June–September 1980;
3. estimation of the percentage change in the number of 'cases' between these periods, based on changes on the control days;
4. estimation of the number of cases that would have occurred between June–September 1981 if the trial had not occurred (bases on the percentage change estimated in step 3);
5. subtraction of the actual number of cases in June–September 1981 from the estimated number for that period; and
6. using the difference between the estimate and actual number of cases, calculating the percentage change resulting from the intervention (1982: 326–334).

Olsson and Wikstrom found a small reduction in alcohol consumption but this was not attributable to the trial. They found some displacement of sales to other days but reasoned that the restriction would have had greater impact on heavy consumers who were less able to plan their purchases. They also found that the trial had no effect on visits to acute medical facilities. They caution that their findings cannot be extrapolated to the long term and might be subject to some unascertained confounding. However,

they found that detentions for intoxication, domestic disturbances, assaults, and other disturbances declined by between four and ten percent as a result of the trial. As a result of the success of the trial, the Swedish parliament subsequently introduced a ban on Saturday trading. In a report prepared for the World Health Organisation, Edwards *et al.* note that an evaluation of this ‘permanent’ (it has since been repealed) Saturday closing of retail outlets by Olsson and Wikstrom found ‘... reductions in adverse consequences’ (1994:137). Unfortunately, I have not been able to obtain a copy of the original report, and am not able to comment on it further.

Ligon and Thyer (1993) conducted a study of the effect of a Sunday ban on alcohol sales on citations for driving under the influence (DUI) in the city of Athens, Georgia in the United States. They calculated the cumulative frequency of citations issued on each day of the week over a two year period from March 1986 to February 1988. These frequencies ranged from a low 41 citations on Sundays to a high of 349 on Fridays.

Multiple chi-square tests were conducted that showed the lower number of citations on Sundays was significantly different ($p= 0.001$) from all days except Mondays (on which there was a total of 73 citations). They noted that the lack of statistically significant difference between Sundays and Mondays means that the lower incidence on Sundays cannot be attributed purely to a reduction in drinking. They also note that other factors—such as fewer police patrolling on Sundays—might also have influenced the results. However, they concluded that:

Pending replication, the results of the present investigation suggest that one ... strategy which is effective in reducing the incidence of DUI-related arrests is to restrict the sales of alcoholic beverages on selected days of the week (1993:39).

In a review article, Makela *et al.* summarised the results of two separate trials of the closure of liquor outlets in Finland (2002). In the first, in 1977, all 10 alcohol retail outlets in three adjacent municipalities were closed for an eight month period. Makela *et al.* report that there was a ‘small’ reduction in alcohol sales compared to the same time period in the previous year and a ‘clear reduction in arrests for drunkenness’. In the second trial, all retail liquor outlets were closed on Saturdays for a period of four months. Compared to the same period in the previous year, it is reported that there was a seven per cent reduction in total alcohol sales. However, ‘[t]he effect on harm rates, if any, was not big enough to be visible in the data, which were not weekday specific’ (2002:39). Unfortunately, I have not been able to obtain copies of the original reports, so it is not possible to subject these results to any critical analysis.

Impact of relaxation of restrictions on particular days

Commencing in the 1970s, various Australian state governments relaxed restrictions that had previously prohibited the sale of alcohol—either in metropolitan regions or state-wide—on Sundays. The effect of this on road traffic safety has been reviewed in a series of papers by Dr Ian Smith, formerly of the Western Australian Alcohol and Drug Authority (now the Drug and Alcohol Office within the Western Australian Department of Health).

The first of the papers by Smith reported on the introduction in Perth, on July 1970, of two 2-hour Sunday drinking sessions. Using data provided by the Research and Statistics Division of the Western Australian Road Traffic Authority, he conducted 2x2 chi-square analysis of the number of people killed in road traffic accidents and the number of casualty accidents on Sundays with those occurring on other days of the week in Perth in the three years before and the three years after the introduction of the Sunday sessions. He also made similar comparison for the rest of the state for the same periods. Comparisons with other days of the week and the remainder of the state provided (gross) controls for other factors. Smith found that:

- the percentage of people killed in traffic accidents on Sundays increased from 11 per cent of 453 persons before the restrictions to 16.9 per cent of 486 persons after the restrictions ($p < 0.02$);
- the percentage of casualty accidents on Sundays increased from 12.3 per cent of 11,595 before the restrictions to 14.2 per cent of 11,870 after the restrictions ($p < 0.001$); and
- in the remainder of the state, there were no statistically significant differences in these two measures (1978:1303).

Smith acknowledged the limitations of his research design, but concluded:

... the results strongly suggest that the introduction of the Sunday drinking sessions did have a detrimental effect on traffic safety (1978:1304).

In December 1979, in NSW, a noon–10:00 pm Sunday trading session for hotels was introduced (licensed clubs were already permitted to trade on Sundays). Smith reviewed the effect of this increase in availability on: fatal, admitted to hospital, injured but not admitted, and tow-away traffic accidents. He compared:

- the numbers of each type of accident in the time periods noon–5:59 pm, 6:00–11:59 pm, and midnight–11:59 am; and,
- all combined casualty accidents in the time periods 6:00–7:59, 8:00–9:59, and 10:00–11:59 pm,

on Sunday with the Monday-Saturday control period for a two year period after the introduction of the session with a three year period before the introduction. Smith also partially controlled for the effect of a reduction in the maximum legal blood alcohol limit from 0.08 to 0.05 per cent from 15th December 1980. In addition, he compared all categories of casualty accidents in NSW with those in Queensland to rule out the possibility that any increase in NSW was part of a more general trend (1987:281–282).

Smith found that in the Sunday noon–11:59 pm period there were 22.2 ($p = 0.001$), 28.2 ($p = 0.001$), and 20.9 ($p = 0.001$) per cent increases respectively in fatality, admitted to hospital, and injured but not admitted traffic accidents (1987:282–3). There was a 14

per cent increase in casualty accidents in NSW in the 6:00–11:59 pm period compared to Queensland, but not in the control periods ($p=0.05$) (1987:285–6, 289). There were also significant increases in casualty accidents for all the two-hour time periods from 6:00 pm–midnight (1987:284–5, 289). Smith concludes that these increases can be attributed to the introduction of the Sunday hotel session (1997:292).

Smith (1998) also evaluated the impact on road traffic accidents of the introduction of two 2-hour drinking sessions on Brisbane in April 1970. The study was based on Australian Bureau of Statistics data by time and day of the week for fatal and casualty accidents (combined) and reported property damage accidents. As in the Perth study, he compared the number of accidents for the three years after, with a control period before, the introduction of the sessions; and conducted similar comparisons with areas within Queensland where Sunday drinking had previously been permitted. As a consequence of the time from which the ABS collections commenced (April 1968) and changes to the reporting criterion for property damage accidents (from \$50 prior to April 1969 to \$1000 subsequently) the control periods were restricted to two years for casualty accidents and one year for property damage accidents. The availability of accident time data enabled him to compare data for particular two-hour time periods—related to the session times and control periods. As in the Perth study, he conducted 2x2 chi-square analysis of the comparisons. Smith found that casualty accidents on Sundays in the 6:00 to 7:59 pm time period (i.e. the two hours after the close of the second session) increased at an annual rate of 129.8 per cent ($p<0.001$). There were no statistically significant increases in other time periods on Sundays, on other days of the week, or in the control areas.

The effects on casualty traffic accidents of the introduction, in Victoria, of two 2-hour Sunday drinking sessions in July 1983, and of a noon–8:00 pm Sunday drinking session in November 1984 were also evaluated by Smith (1990). Data on casualty accidents were obtained from Australian Bureau of Statistics publications. As a control period for both changes, Smith used the four year period 1980–1983. As the intervention period for the effect of the 2-hour session he used 1984, and for the 8-hour session 1985. For the time periods noon–8:00 pm, 8:00 pm–midnight and midnight–noon on Monday to Saturday and Sundays for the 1980–1983 control period, he calculated the mean number of accidents per year and, to allow for random fluctuations, calculated the 95 and 99 per cent confidence intervals. He then ascertained the number of accidents in the same time periods for 1984 and 1985 and determined whether or not they were within the confidence limits (i.e. how probable it was that any change had occurred by chance). As in his earlier studies, Smith also calculated 2x2 chi-square analysis of differences between those in the time periods of interest on Sundays and in control time periods in the before and after periods.

Smith found that, in 1984: there were increases in casualty accidents in all time periods on Monday to Saturday; and there had been significant changes in the noon–8:00 pm period on Sunday. However, the Sunday increase could not be attributed to the introduction of the two 2-hour sessions (Smith 1990:419, 420–421). In his discussion of the results, Smith states that this was probably due to the relatively small percentage of hotels and clubs that applied for Sunday trading permits (15.9 per cent of hotels and 1.8 per cent of clubs) (1990: 418, 420–421).

For 1985, Smith found that there had been significant increases in accidents in the noon–8:00 pm time periods on both Monday to Saturday and Sunday, compared to the control period of 1980–93. On Sunday from 8:00–midnight (the period after the close

of the 8-hour session) there was an increase in accidents which did not occur in either the same time period Monday–Saturday or in the Sunday control period of midnight–noon. The annual increase in the Sunday from 8:00–midnight period was 45 per cent ($p=0.001$) compared to Monday–Saturday, and 32.6 per cent ($p=0.001$) when compared to the Sunday control period. In discussing these results, Smith states that it could be argued that the 45 per cent increase was an over-estimation of the effect of the 8-hour Sunday session,

... as it was calculated after allowing for the slight Monday to Saturday decreases from 1980–83. By contrast such a criticism is not applicable to the 32.6% figure, for it allows for any general change in Sunday driving or recreational habits from the period to 1985 (1990:421).

Smith acknowledges that the 1984 and 1985 ‘after’ periods did not exactly coincide with the timing of the legislative changes. However, he notes that the effect of this would be to weaken the power of the statistical analyses (1990:422). He also makes the point that by June 1986 only 57.3 per cent of hotels and 68.7 per cent of clubs had obtained Sunday trading permits and that, if all hotels and clubs traded on Sundays, the increase in 8:00 pm–midnight accidents may have been greater (1990:422).

Impact of partial restrictions on particular days

Apart from the Australian studies, discussed below, I have been able to identify only one international study that has examined the impact of partial restrictions on the sale of alcohol on particular days of the week. In a review prepared for the World Health Organisation, Edwards *et al.* (1994:137) cite a report by Nordland (1985) on the evaluation of a year long trial of the Saturday closing of state-run stores in Norway that had a monopoly on wine and spirits sales. According to the summary by Edwards *et al.*, the restriction had little impact on consumption—as consumers either purchased wine and spirits on other days or switched to the purchase of beer—but that it reduced the rate of acute alcohol problems. As with the articles reviewed by Makela *et al.* (2002), cited above, I have not been able to obtain a copy of this report and cannot comment on either the magnitude of the change or the methods employed in the evaluation.

Following protracted expression of public concern about high levels of acute alcohol-related problems in Tennant Creek, the Northern Territory Liquor Commission (now the Licensing Commission) introduced a six month trial of restrictions on the supply of alcohol in the town. The restrictions commenced in August 1995 and were conducted in two three-month phases. Most of the restrictions were common to both phases and, among other measures, these common restrictions included:

- front bar sales restricted to 10:00 am to 9:00 pm on days other than Thursdays;
- take-away sales restricted to 12:00 noon to 9:00 pm on days other than Thursdays;
- wine only to be sold in front bars if accompanied by a substantial meal;
- in front bars, when permitted to trade between 10:00 am and noon, light beer the only alcoholic beverage to be sold during those hours;
- sales of cask riesling or moselle in containers greater than two litres prohibited; and
- sales of cask wine less than two litres in volume restricted to one transaction per person to day.

The difference between the two phases related to restrictions on Thursday which applied to hotels and liquor stores, but not licensed clubs. In Phase 1, the Thursday restrictions were

- no sales from the front bars of hotels; and,
- no take-away sales from hotels and liquor stores.

In Phase 2 the Thursday restrictions were:

- front bar sales 3:00 – 9:00 pm; and
- take-away sales 3:00 – 9:00 pm.

The restrictions on Thursday trading were implemented because there was a relatively high proportion of people in the town who were dependent on social security entitlements and these were generally paid on Thursday. It was anticipated that the restrictions on that day would result in less money being expended on alcohol and more on foodstuffs and other items.

Theoretically, because the difference between the two phases of the trial related only to the variation in restrictions on Thursday—as well as being able to assess the impact of the overall trial—it might have been possible to measure the impact of the differential Thursday restrictions.

The restrictions were evaluated by d'Abbs *et al.* from the Menzies School of Health Research (1996). They were not able to obtain liquor sales data for the whole of the trial period. However, they found that in the October–December 1995 quarter there was an overall decrease in the total volume of alcoholic beverages of 2.7 per cent. This included a 53.5 per cent decrease in cask wine sales and a seven per cent increase in full-strength beer sales (1996:36). As these changes are based on the volume of beverage sales—rather than the volume of ethanol—they under-estimate the decline in consumption of pure alcohol. Data from a later study by Gray *et al.* show that in terms of pure alcohol, sales in Tennant Creek in the October–December 1995 quarter were 14.4 per cent lower than in the same quarter in 1994 and ten per cent lower than in the preceding year (2000:41).

d'Abbs *et al.* used a number of indicators to assess the impact of the restrictions. The most important of these were:

- the frequency of selected police offences often associated with excessive alcohol consumption (assault, criminal damage, unlawful entry, stealing, and interfering with a motor vehicle); and,
- presentations to the Accident and Emergency Section of Tennant Creek Hospital for all presentations coded as alcohol-related, assaults, and selected diagnostic categories of which a high proportion are known to be alcohol-related (fractures, head injuries, laceration and stab injuries).

Three comparisons were made among these indicators:

- Phase 1 with the same 13 week reference period in the previous year;
- Phase 1 with 10 weeks of Phase 2 (adjusting for the different lengths of the periods); and,
- 10 weeks of Phase 2 with the same 10 week reference period in the previous year.

With regard to the police offence data:

- in Phase 1, the number of offences was 14.5 per cent less than in the first reference period;
- in Phase 2, the number of offences was ‘virtually the same’ as it was in Phase 1 (i.e. it was 4.8 per cent less); and
- in Phase 2 the number of offences was 9.4 per cent higher than in the second reference period [7.7 per cent higher by my calculation from the figures they present] (1996:17–19).

With regard to the hospital data, based on their report and my calculations based on the data they present:

- in Phase 1, presentations coded as alcohol-related, assaults, and selected diagnoses declined by 34, 21 and 26 per cent respectively when compared to the first reference period;
- in Phase 2, presentations coded as alcohol-related, assaults, and selected diagnoses increased by 26, 72 and 14 per cent respectively when compared to Phase 1; but
- in Phase 2 presentations coded as alcohol-related, assaults, and selected diagnoses were 42, 9.6 and 27 per cent less than in second reference period (1996:21–29).

In their summary of the hospital admission data, d'Abbs *et al.* note that the increases in the three indicators in Phase 2 in comparison to Phase 1,

... cannot be attributed automatically to the less restrictive licensing provisions [i.e. those on Thursday] that applied during Phase 2, since there appears to be a seasonal rise in presentations at this time of the year (1996: 44).

Noting the time and resource restraints on the evaluation, d'Abbs and his colleagues concluded:

We do not claim to have identified every effect of the trial, much less to have teased out all the linkages of cause-and-effect at work. Nonetheless we believe that we have brought together a strong body of evidence pointing to three important conclusions, these are:

- firstly, that the trial measures have attained significant positive outcomes;
- secondly, that the measures have a high degree of community support ...; and,
- thirdly, that while some unintended consequences emerged in the course of the trial, these are not of sufficient magnitude to negate the positive outcomes (1996:61)

The NT Liquor Commission reviewed the evaluation report and generally accepted the findings. On the basis of this and other evidence, in March 1996, the Commission reached a decision to impose a permanent, modified set of restrictions in Tennant Creek—including the Thursday bans on hotel front bar trading and on packaged liquor sales from hotels and liquor stores (Northern Territory Liquor Commission, Decision, 19th March 1996).

While the evaluation of the trial restrictions in Tennant Creek provides support for their overall effectiveness, the results are equivocal with regard to the specific effectiveness of the Thursday restrictions. Despite some cautions, d'Abbs and his colleagues give emphasis to some of the declines in hospital admissions figures. However—after entering the data on police offences and hospital admissions provided in the evaluation

report into contingency tables and conducting chi-square tests on them—I found that for all of the differences between the two phases of the trial and the reference periods the probability of any them occurring by chance was greater than ten per cent (i.e. $p > 0.10$). That is, despite the apparently large percentage changes in some variables, the differences were not statistically significant. This is not to say that the Thursday restrictions *per se* did not lead to a reduction in alcohol-related harm. Rather, it indicates that the evidence provided by d'Abbs *et al.* is insufficient to support a claim that they were effective. To conclusively resolve the issue of their effectiveness would require a much longer time series, and controls to determine their interaction with other restrictions. Unfortunately, in natural experiments such as this, it is extremely difficult to meet such conditions.

A second evaluation of the Tennant Creek restrictions was carried out in 1998 by Gray *et al.* (1998, 2000). Among other findings, they documented:

- a statistically significant ($p=0.001$) decline in per capita consumption of pure alcohol from 25.3 litres in the year preceding the restrictions to 20.4 litres in the second year of their operation; and,
- statistically significant declines in hospital admissions for potentially alcohol-related diagnostic groups among persons aged 18–35 years ($p=0.0001$) and in admissions of males ($p=0.003$)—i.e. among those most likely to be affected by alcohol.

As in the case of the evaluation of the trial conducted by d'Abbs *et al.*, that by Gray and his colleagues aimed to assess the impact of the restrictions as a whole—not the impact of particular restrictions. Nevertheless, some of the findings are suggestive of the positive impact of the Thursday restrictions.

Over the period from the year preceding the introduction of the trial restrictions, through the six month trial period, and the two years after the decision to introduce permanent restrictions, the number of intoxicated people taken into protective custody almost doubled from 633 to 1169. However, the percentage taken into custody on Thursday declined from 20 to seven per cent. During the same period, there were relatively small changes in reported offences known to be commonly associated with excessive alcohol use. Again, as in the case of people taken into protective custody, there was a decline in the number of offences committed on Thursday (2000:42).

Gray *et al.* report that, in interviews, the police and other informants, attributed the increase in people being taken into protective custody to increased police activity and improved police performance. The police also suggested that the apparent increase might have been due to improvements in their recording procedures. Given that there was some increase in police activity, Gray *et al.* suggest that there may also have been a real decrease in the total number of offences committed as opposed to those recorded. Nevertheless, the police reported that prior to the introduction of restrictions they had three 'busy' days per week (Thursday, Friday and Saturday) but after the restrictions this was reduced to two (Friday and Saturday). As a consequence of this change, the town's sobering-up shelter ceased opening on Thursday nights (2000: 42–43).

It might still be argued that the reduction of public order problems on Thursday represents a shifting of the problems to other days of the week. However, even if this was shown, the fact remains that the Thursday restrictions provide at least one night per week of respite from the high levels of alcohol-related disturbances in the town.

Following the evaluation by Gray *et al.* and consideration of various submissions, in November 1998, the Liquor Commission handed down a decision that ‘All existing restrictions shall be retained’ subject to a further review in November 2000 (NT Liquor Commission, Decision, 19th November 1998). That further review was undertaken in September and October 2000 by d'Abbs *et al.* (2000). They found that:

- over the period since the restrictions were introduced they have contributed to a decline in apparent alcohol sales—although there were increases in apparent sales from the licensed clubs not affected by the restrictions (2000: 10–16);
- there have been continuing declines in presentations to the Accident and Emergency Section of the Tennant Creek Hospital for the diagnostic categories of assault, fracture, injury, and laceration; particularly among Aboriginal people (2000:17–22); and,
- the restrictions may have contributed to a decline in the rate of assaults, which came to an end in mid-1999, and they may have contributed to a short term drop in property offences, but not of sufficient strength to counter an upward trend that pre-dates, and continued after, the introduction of restrictions (2000:27).

With regard to Thursday, d'Abbs *et al.* reproduce data provided to the NT Licensing Commission by Sergeant Wayne Jackson of the Tennant Creek police station. This shows—over three four month periods in 1999 and early 2000—increases on Thursday in: reports by the public about public drunkenness, reports generated by the police related to public drunkenness, protective custody apprehensions, and related arrests. The data show some fluctuations and because it is not a complete time series does not lend itself to critical statistical analysis. Nevertheless, it does lend support to concern about the effect of the Thursday restrictions. d'Abbs *et al.* wrote that, in a letter to the Licensing Commission, Sergeant Jackson:

... described the sale of alcohol on Thursdays in Tennant Creek as “completely artificial” and added: “Any member of this community can obtain alcohol from various outlets in large quantities”. The letter identified a number of outlets as being engaged in selling alcohol on this day. Thursdays, according to the letter, had now become one of the busier days for police in Tennant Creek (2000:26).

In interviews with, and written submissions from various stakeholders, among the factors identified as undermining the effectiveness of restrictions were a change in the payment of Centrelink benefits to other days as well as Thursday, and the exploitation by some licensees of loopholes (for example, the fact that restrictions did not apply to licensed clubs) that enabled them to sell alcohol on Thursday. In summarising these submissions, d'Abbs *et al.* state that most considered the restrictions, especially those relating to Thursday trading, were not working—although they note that several people stated that they had initially worked well. Despite this, most advocated modifying the restrictions rather than abandoning them (2000:32).

The NT Licensing Commission conducted various consultations with stakeholders, and considered submissions and the evaluation report by d'Abbs *et al.* On the basis of these, the Commission made a decision to tighten the restrictions by extending those on Thursday trading to licensed clubs in Tennant Creek (NT Licensing Commission, Decision, 17th December 2001).

The other location in which a partial restriction on Thursday trading in packaged liquor has been implemented and evaluated is Derby in Western Australia. Unlike Tennant Creek, the restrictions in Derby were implemented under the terms of a licensee 'accord'. Among the terms of the accord:

- the sale of packaged liquor on Thursdays was prohibited;
- the sale of packaged liquor on other days was restricted to between 12 midday and 10:00 pm;
- an exception was made for both of the above provisions in the case of persons purchasing other goods as part of a consignment to general goods to be taken or delivered to premises or locations more than 20 km from Derby; and,
- the sale of wine in 4 litre casks [was] prohibited.

Licensees agreed to voluntarily adhere to the restrictions in April 1997, and d'Abbs and Togni from the Menzies School of Health Research undertook an evaluation of its effect from then until September 1997. Among their conclusions were the following.

- The trial measures *may* have contributed to a slight fall in alcohol consumption in Derby. ... estimated purchases of high alcohol beverages in 1996/97 were 1.9% lower than they were in the preceding year, but this trend appears to have commenced in the year preceding the trial.
- The trial measures were accompanied by a significant drop (37%) in the incidence of police offences in the categories of assaults, sexual offences, damage and threatening behaviour. The effect of the measures appears to have been most pronounced during the first few months of the trial period.
- ... we conclude that we do not have sufficient evidence to assert that the trial measures had any impact on the level of injuries, but at the same time, *do not have sufficient evidence to show that they had no effect* [emphasis in the original] (1997:10).

The evaluation was conducted under restraints of time and resources. The measure of alcohol consumption was crude and does not specifically compare the period of the restrictions with a preceding time series. This means that the status of the first conclusion is subject to dispute. As in the Tennant Creek restrictions, the aim of the evaluation was to measure the impact of the restrictions as a whole. It does not examine the specific impact of the restriction on the sale of packaged liquor on Thursday. However, it does include stakeholder comments on the restriction and the results of a community survey include information on community attitudes to that particular restriction, as well as to the others. These are discussed below.

Community attitudes to restrictions on particular days

Researchers who have first hand experience with licensing restrictions in remote areas of Australia—including d'Abbs and Togni (2000), Brady (2000), and Gray (2000a)—have all written that community support is essential if they are to be effective. In 1993, Ian McAllister from the University of New South Wales conducted a household survey—among a nationally representative stratified random sample of 3500 individuals—to examine support for 11 separated policies designed to reduce alcohol consumption. In the introduction to a report on this research, he highlights the harm

caused by excessive alcohol consumption and the desire of governments to reduce that harm. Summarising his findings, he wrote:

There is strong public support for policies that control alcohol use and, with the exception of restricting alcohol sponsorship to sporting events, for moves to curb the promotion of alcohol. However, public opinion is evenly divided on moves to restrict availability, with the single exception of raising the minimum legal drinking age, which attracts majority support. ... the findings highlight the difficulties that governments will face in restricting the availability of alcohol (1995:179).

The available evidence suggests that total restrictions on particular days can have positive effects in reducing alcohol related harm. However, they are unlikely to have majority community support. This is suggested by the results of the survey by McAllister and from surveys conducted in Tennant Creek (Gray *et al.* 1998) and Alice Springs (Hauritz, McIlwain & Finnsson 2000).

As part of the second evaluation of the Tennant Creek restrictions, Gray *et al.* (1998; 2000) conducted a sample survey of 271 residents (105 Aboriginal and 166 non-Aboriginal) based on the methodology developed by d'Abbs *et al.*—in consultations with the Australian Bureau of Statistics—for the evaluation of the trial restrictions (d'Abbs *et al.* (1996:11). Gray *et al.* asked participants whether or not they were in favour of other restrictions that had been suggested. When asked if they were in favour of banning all sales of alcohol on Thursdays, only 37 per cent (95% CI = 31.3– 42.8) answered affirmatively (1998:22).

Prior to a decision by the NT Licensing Commission to introduce alcohol restrictions in Alice Springs (Decision, 1st March 2002), there was a long period of community discussion and consultation. As part of this, the Alice Alcohol Representative Committee—representing a broad range of community interests in matters relating to alcohol in Alice Springs—awarded a tender to Hauritz and Associates:

To conduct research (using both qualitative and quantitative measures) to establish the perceptions of a representative sample of Alice Springs residents on the consumption of alcohol and how best to encourage the minimisation of the consumption of alcohol at excessive levels (Alice Springs Town Council 1999).

Aspects of the report produced by Hauritz and Associates (Hauritz, McIlwain & Finnsson 2000) have been subject to both public and academic criticism (Gray 2000b). However, Gray concluded that—despite other serious weaknesses—the population survey component of their study was:

... sufficiently robust to demonstrate that within the Alice Springs community the majority of people believe that alcohol represents a significant problem in the town, and that there is strong support for, at least, the following:

- increased restrictions on the availability of alcohol;
- controls on public consumption of alcohol; and
- responsible service of alcohol.

With regard to specific strategies there is room for further debate and consideration of alternatives—particularly as not all are clearly based on the views of a majority of people in Alice Springs [emphasis added] (2000b:15).

One of these specific strategies was a ban on Thursday trading. Hauritz *et al.* reported that 53.07% of the sample thought it was desirable or highly desirable that there should be an 'alcohol free day' and that 55.6 per cent favoured Thursday as an alcohol free day

(2000:125). However, as Gray has written, the 55.6% reported as favouring Thursday as an alcohol free day comprise 55.6% of the 52.5%—not 55.6%, or a majority, of the total sample as claimed by Hauritz *et al.* (2000:128–9). Furthermore, based on the sampling methodology, the proportion of the population supporting an alcohol free day was probably between 48 and 58 per cent—and it might be that there is *not* majority support for such a strategy. Gray went on to say, ‘caution would dictate that the result be interpreted as being that there is no clear-cut support for this strategy’ (2000b:12). Unfortunately, Hauritz *et al.* did not ask whether or not there was support for a ban on Thursday packaged liquor sales.

As part of the evaluation of the trial restrictions in Tennant Creek, d’Abbs *et al.* conducted a household survey of attitudes to the restrictions. The survey was based on sampling methodology developed with advice from the Australian Bureau of Statistics and the sample included one adult from each of 270 households, 70 of which were selected from Aboriginal town camps (1996:11). For practical reasons, participants in ‘private dwellings’ and those in town camps were asked different sets of questions. Those in private dwellings (who include Aboriginal people), were not asked whether they were in favour of specific restrictions. However, 84.5 per cent said they had not been personally affected by the ban on Thursday packaged liquor sales, and 54.9 per cent reported that they were generally in favour of the restrictions as a whole. Among town campers 68.7 per cent were generally in favour of the restrictions as a whole. Furthermore, 45.2 per cent of males and 74.3 per cent of females in the town camp sample described the ban on Thursday packaged liquor as ‘good’ (1996:54–58).

As indicated previously, as part of the second evaluation of the Tennant Creek restrictions, Gray *et al.* (1998; 2000) conducted a sample survey of 271 residents (105 Aboriginal and 166 non-Aboriginal). However, unlike d’Abbs *et al.*, they asked all participants about their attitudes to each particular restriction. They found that with regard to the ban on packaged liquor sales on Thursday:

- 46 per cent wanted it retained (95% CI = 40.2 – 52.1);
- 13 per cent wanted it strengthened, usually by applying it to licensed clubs as well as hotels and liquor stores (95% CI = 9.3 – 11.8);
- seven per cent wanted it eased (95% CI = 4.4 – 10.5); and,
- 30 per cent wanted it dropped (95% CI = 24.7 – 35.5)(2000:43).

Although not reported in the published reports, 67.6 percent of Aboriginal and 53.1 per cent of non-Aboriginal participants were in favour of either retaining or strengthening the restriction.

A household survey of attitudes to the restrictions was conducted by d’Abbs *et al.* in the third Tennant Creek evaluation, in September and October 2000. They conducted a telephone survey of 200 residents and conducted face-to-face interviews with 50 residents of Aboriginal town camps. As in the 1998 survey conducted by Gray *et al.*, they asked participants about their attitudes to each of the restrictions. With regard to the restriction on Thursday packaged liquor sales they found that:

- 46.8 per cent favoured retaining the restriction, and
- 35.2 per cent favoured scrapping the restriction

A further 15.2 per cent favoured modifying the restriction. However—apart from six per cent who favoured extending it to include licensed clubs and two per cent who

wanted the day changed to Sunday—it is not clear from the report what else such modification might entail. On the basis of the survey results they concluded:

Even in the case of the least strongly supported restrictions—those applying to Thursday trading and the ban on sales of 4 litre wine casks—no more than 35% of respondents advocated scrapping them; between 45% and 50% wished to retain the restrictions in their present form, and between 10% and 17% advocated modifications. The most frequently proposed modifications involved making the restrictions more, not less, comprehensive in scope.

In the case of all other restrictions, a majority supported retaining the restrictions in their present form; in most instances the majority involved was around two-thirds of respondents (d'Abbs *et al.* 2000:38).

In the evaluation of the restrictions introduced under the Derby accord, d'Abbs and Togni conducted a telephone survey with 198 people (104 males and 94 females). The sample

...was randomly drawn from non-commercial numbers listed in the 1997 Derby/West Kimberley Information Directory Published by the Derby Chamber of Commerce and the Derby Tourist Bureau (d'Abbs and Togni 1997:27).

As Aboriginal people were likely to be under-represented in the survey, face-to-face interviews were conducted with 78 CDEP participants (56 males and 22 females) from local Aboriginal communities. Unfortunately, different questions were asked of participants in each survey. In the telephone survey, participants were asked whether they were in favour of the three restrictions as a package. However, in the face-to-face interviews participants were asked their opinions about each of the restrictions specifically. In the telephone survey 57.9 per cent of participants were in favour of the restrictions (47.3 per cent of males and 67.3 per cent of females). The sample of Aboriginal participants is likely to be biased and it is not really possible to generalise from it to the larger Derby Aboriginal population. Nevertheless, 35.7 per cent of males and 59.1 per cent of females were in favour of the restriction on Thursday packaged liquor sales (2000:45). With regard to the trial measures in general, d'Abbs and Togni concluded that '... there appears to be overall majority support for them among Derby residents, and for their continuation' (1997:48). However, they also concluded that, in Aboriginal communities '(t)he ban on Thursday takeaway trading is opposed by many, and seen as only marginally helpful by others' (1997:48).

Implications for Port Hedland and South Hedland

The high levels of alcohol consumption and related harm in Port Hedland, South Hedland and the surrounding region have been documented in a submission, made by Gray and Siggers (2002) to the Director of Liquor Licensing. The accuracy of figures presented in that submission on levels of per capita consumption of pure alcohol in the Pilbara Statistical Division (SD) for the period 1991–92 to 1998–99 was challenged by Mr Tim Monaghan at the hearing held by the Director of Liquor Licensing. As Mr Monaghan correctly pointed out, the mean estimated service population (ESP) figures used in the estimate did not include an influx of 500 additional workers to the region for *part* of that period. Lest this lead to some misapprehension about the levels of consumption in the region it is important to point out that—because the level of alcohol consumption in the Pilbara SD is so high above the State average—the impact of such a population influx on per capita consumption is marginal. If 500 persons are added to the mean ESP for the *whole* of the five year period (not just part of

it), estimated per capita consumption falls from 17.35 litres to 17.11 and is 70 (not 72) per cent above the State average. Even if the influx of workers is doubled to 1000 persons and added for the whole period, estimated per capita consumption is 16.87 litres and is still 67 per cent greater than the Western Australian average. It should be noted that these are conservative estimates because they do not include alcohol purchased in Perth but consumed in the Pilbara SD.

Estimates of per capita consumption of pure alcohol Pilbara SD, 1991–92 to 1998–99

	Population	Litres of pure alcohol	Per capita consumption (litres)	Percentage above WA average
Mean ESP 91–92 to 98–99	35,622	617,915	17.35	72%
Mean ESP 91–92 to 98–99 + 500	36,122	617,915	17.11	70%
Mean ESP 91–92 to 98–99 +1,000	36,622	617,915	16.87	67%

Taking into account these differences in the calculations of per capita consumption, Gray & Saggars showed that:

- in the period 1991–92 to 1998–99, per capita consumption in the Pilbara SD was 1.7 times the WA average (2002:5)—1.67 times if the largest, most conservative, of the population estimates from the table above is used;
- in the period 1991–92 to 1998–99, non-Aboriginal consumption was 1.67, and Aboriginal consumption was 2.29, times the WA average (2002:6–7)—1.62 and 2.23 using the largest population estimate;
- high strength beer accounted for 40.9 per cent, and cask wine for about 15 per cent, of total sales of pure alcohol in the Pilbara SD in the period 1991–92 to 1998–99 (2002:5–6);
- the age standardised rates of hospitalisation for alcohol-caused conditions in the Pilbara Health Zone for 1996–2000 were 1.22:1, 1.71:1, 1.22:1 and 1.17:1 respectively for Aboriginal males, Aboriginal females, non-Aboriginal males, and non-Aboriginal females compared to the same population groups in WA as a whole (2002:8–9); and,
- crude arrest rates for offences commonly associated with alcohol were 1.16:1 and 1.26:1 for Aboriginal and non-Aboriginal people in the De Grey Statistical Sub-Division compared to those in WA for the period 1994–2000 (2002:10).

In the submission to the Director of Liquor Licensing, as well as documenting these high levels of consumption and related harm, Gray and Saggars also reviewed the results of evaluations of restrictions on the availability of alcohol that have been applied in various locations in Western Australia and the Northern Territory and critiqued some of the common objections to liquor licensing restrictions (Gray & Saggars 2002).

Gray and Sagers concluded that restrictions such as those proposed for Port Hedland and South Hedland are not in themselves sufficient to tackle excessive drinking and alcohol related harm (2002:23). However, in conjunction with complementary harm- and demand-reduction measures, and with the support of both the Aboriginal and non-Aboriginal communities, the proposed restrictions can be an effective part of a broad-based strategy to reduce excessive levels of alcohol consumption and related harm (2002:26–27).

In those locations, such as Tennant Creek and Derby, where similar restrictions to those proposed for Port Hedland and South Hedland have been implemented, there have been no specific evaluations of the impact of restrictions on packaged liquor sales on particular days of the week. To assess the likely effectiveness of these particular restrictions, it is necessary to make inferences from:

- the general literature on the impact of imposing, or relaxing, restrictions on alcohol sales on particular days of the week; and,
- the limited information relating to restrictions on particular days in the evaluations of local restrictions elsewhere in northern Australia.

At least from a scientific, if not practical, point of view, it is unfortunate that when government authorities—be they national, state or local—introduce changes to restrictions on the availability of alcohol they do so in a way that precludes rigorous evaluation of the effects of those changes. For this reason evaluation studies are few in number, are often *ad hoc*, focus on a limited number of outcome variables, and suffer from methodological weaknesses such as lack of adequate controls and limited availability of time-series data. Despite these problems, however, the limited number of evaluation reports available does provide some evidence for the effectiveness, or otherwise, of such changes.

Studies of the imposition of bans on the sale of alcohol on particular days of the week—reviewed in detail above—have produced variable results. The study by Olsson and Wikstrom (1982) of a three month trial of Saturday closing of alcohol retail outlets in Sweden in 1981 found no reduction in consumption due to the trial but found reductions in various public order problems of between four and ten per cent. In turn, the positive results of this trial led to a long-term ban on Saturday trading which was also found to have led to a reduction on alcohol-related harm (Edwards *et al.* 1994: 137). In a city in the United States, Ligon and Thyer (1993) found a significant reduction in citations for driving under the influence of alcohol associated with a ban on Sunday alcohol sales. Not all of the reduction they found could be attributed to the Sunday ban, but they concluded the ban was effective in reducing DUI-related arrests. In a review of two Finnish trials of the closure of retail liquor outlets on Saturday, Makela *et al.* (2002) reported that in the smaller trial there was a small reduction of alcohol sales and a clear reduction in arrests for drunkenness, and in the larger trial there was a seven per cent reduction in total alcohol sales but no obvious effects on harm rates. From these studies is possible to tentatively conclude that bans on alcohol sales on particular days of the week:

- have limited effect on alcohol sales—probably because some are displaced to adjacent days;
- are likely to have a greater impact on problem drinkers who are less able to plan their purchases; and,

- have variable, but positive, effects in reducing some acute indicators of harm.

Studies of the converse intervention—relaxation of restrictions on particular days of the week are also limited in number. The four that are available were all conducted in Australia and examine the impact of the introduction of Sunday drinking sessions in states where they were previously non-existent or limited. All were conducted by Smith (1978, 1987, 1988, 1990), using similar methods, and the only outcome variables examined were various types of road traffic accidents. These studies consistently show that there were significant increases in road traffic accidents associated with the introduction of Sunday drinking sessions.

There is much stronger evidence for the positive effect of other forms restrictions on availability in reducing excessive alcohol consumption and related harm (Edwards 1994, Gruenewald 1993). However, the limited number of studies on the effects of imposing or relaxing restrictions on the sale of alcohol on particular days of the week provide what Edwards, with regard to restrictions on availability in general, has described as ‘a confluence of evidence’ (1994:143)—albeit tentative—with regard to their efficacy.

In response to community concerns about excessive levels of alcohol consumption and related harm, restrictions similar to those proposed for Port Hedland and South Hedland have now been introduced—by way of amendment to liquor licenses—in Alice Springs, Curtin Springs, Elliott, Katherine, Nhulunbuy and Tennant Creek in the Northern Territory and in Halls Creek in Western Australia. Also, licensee ‘accords’ with similar—though unenforceable provisions—have been introduced in Derby, Broome, Fitzroy Crossing, and Kununurra among other locations in Western Australia.

The most effective way to reduce harm related to excessive alcohol consumption is through price and taxation measures (Edwards 1994, Gruenewald 1993). These measures are not directly available at the local level—although bans on wine in casks of greater than two litres are an indirect means of raising price. Other supply reduction strategies produce relatively small effects. For this reason, local restrictions have generally been introduced as a ‘package’ rather than in isolation. This has been the case in all locations in which local restrictions have been introduced, except Curtin Springs. In Curtin Springs there was only one restriction that prohibited sale of alcohol to Aboriginal people resident in, or travelling to, Ngaanyatjarra, Pitjantjatjarra and Yangkuntjatjarra lands. Where restrictions have been introduced as a package, in no two locations has the package been the same.

In the cases where restrictions have been evaluated, the packages have been evaluated as a whole, not as individual measures. Where they have been evaluated—in Elliott, Tennant Creek, and Curtin Springs, Derby and Halls Creek, d’Abbs and Togni found:

Restrictions were found to have a modest but real impact on alcohol consumption, and a significant impact on indicators of alcohol-related harm, especially violence. Restrictions were also found to have widespread community support, often qualified by a belief that other measures were also required.(d’Abbs and Togni 2000:45).

The reason that restrictions are evaluated as packages is that the restrictions making up a package do not have an impact independently of each other and, methodologically, it is not possible to separate out the relative contribution each has made to any outcomes.

Nevertheless, in Tennant Creek and Derby, it is possible to identify some effects of restrictions on packaged liquor sales on particular days of the week.

As indicated above, there is evidence that total restrictions on the availability of alcohol on particular days of the week are effective in reducing alcohol-related harm. In Tennant Creek, before the introduction of the trial restrictions in 1995, there had been some lobbying for a ‘dry day’ on which all alcohol sales would be banned. However, there was never sufficient support for this—before or after the introduction of restrictions—for the implementation of such a ban. Instead, along with other measures, it was deemed more appropriate to ban packaged liquor sales on a particular day—in this case Thursday. The rationale for this was:

- packaged liquor is considerably cheaper per standard drink than that sold for consumption on licensed premises, and that this encourages excessive consumption;
- packaged liquor is often consumed excessively in public places where there are few restraints on intoxicated behaviour;
- that such a ban—and the associated prohibition of front bar sales on Thursday—would lead to a net reduction in alcohol consumption and related harm;
- that such a ban would provide a day of respite from the levels of social disruption and would focus the attention of heavy drinkers on other activities;
- by instituting the ban on Thursday—the day on which most social security entitlements and wages were paid—it would divert some money away from alcohol purchases to additional purchases of food and other goods; and,
- that the ban would have a disproportionate effect on heavy drinkers—many of whom were known to be Aboriginal people.

A ban on packed liquor sales in Derby was instituted under the licensee accord for similar reasons.

Packaged liquor sales were targeted because, as elsewhere in Australia, they are cheaper—meaning that a person can purchase more alcohol for a given amount of money—and most alcohol is sold for consumption off licensed premises. (For example in Western Australia in the 2000–2001 financial year, of total wholesale purchases of 15,144,485 litres of pure alcohol 52.16 per cent was bought for sale by liquor stores and of the remainder a significant, but unknown, proportion was sold from hotel bottle shops—based on data provided to the National Drug Research Institute by the Office of Racing Gaming and Liquor.)

No general Australian data is available on the sale of alcohol by day of the week and none of the local evaluations of restrictions has examined the impact of restrictions on sales by day of the week. In the trial of Saturday closing in Sweden, Olsson and Wikstrom (1982) did not find any reduction in consumption attributable to the trial and found some displacement of sales to other days. Although there is no direct evidence, it is likely that in Tennant Creek there was some displacement. However, there was clear evidence there that some people were circumventing the restriction on hotel and bottle shop sales by purchasing alcohol from licensed clubs—either directly or through third parties (Gray *et al.* 1998:39–41).

If a restriction on Sunday packaged liquor sales was introduced in Port Hedland and South Hedland, there is likely to be some displacement to other days as people pre-

purchase packaged alcohol for consumption on the day of the restrictions. If the measure did contribute directly to a reduction of consumption on that day it is likely to be relatively small. As suggested by the Swedish study, and by my own observations in Tennant Creek, the restriction is likely to have greater impact on a minority of people who are so alcohol dependent that they are less able to plan their consumption—although from the point of view of members of their families and from a public health perspective this is a positive outcome.

In Tennant Creek, over the 6-month trial period and the first two years of the permanent restrictions, per capita consumption among persons aged ≥ 15 years of alcohol was reduced from 25.3 litres in 1994–94 to 20.4 litres in 1996–97. This reduction was almost entirely due to a reduction in take-away sales of cask wine as a result of the ban on casks of >2 litres. It is not clear what contribution if any the Thursday ban on packaged liquor sales had on the overall reduction in consumption. However, if it did make a direct contribution, it would have been relatively small. In the review of the Derby restrictions, there was a relatively small reduction in the litres of beverages sold. However, because the evaluators did not convert these to litres of alcohol it is not clear what the actual reduction in alcohol consumption was. Again, however, it is likely that the contribution of the ban on packaged liquor sales on Thursday was relatively modest.

Evidence for the direct impact of Thursday restrictions on indicators of harm in Tennant Creek is equivocal, and from Derby none is available. There is no evidence from the evaluation of the trial restrictions in Tennant Creek that there were significant reductions in either alcohol-related police offences or hospital admissions associated with the variations on Thursday sales of packaged liquor (d'Abbs *et al.* 1996). However, the length of the trial and the reference (control) periods were too short to yield definitive results one way or the other.

In the second evaluation of the Tennant Creek restrictions, Gray *et al.* (1998, 200) found no direct evidence of a reduction in police offences but did find reductions in the proportion of offences committed, and the number of people taken into protective custody on Thursday. Police representatives also reported to Gray *et al.* that Thursday was no longer one of their busy nights. This general quietening effect of the restrictions was also reflected in the fact that the town's sobering up-shelter ceased opening on Thursday nights (2000:42).

As d'Abbs *et al.* report, this situation changed in the following two-year period—with Thursday again becoming a busy night for the police and the sobering-up shelter re-opening (2000). However, this was attributed not to a failure of the Thursday restrictions *per se*, but to trading by licensed clubs which enabled people to circumvent the restrictions (d'Abbs *et al.* 2000:31). This suggests that, even if proposed restrictions on Thursday packaged liquor sales did not directly contribute to reductions in specific harm indicators, they may be effective in at least providing some respite on that day. The proposal to restrict packaged liquor sales on Sunday in Port Hedland and South Hedland is likely to have a similar effect and would enhance the tighter restrictions on availability that are already in force on that day. However, imposition of such restrictions on Thursday—when liquor stores as well as hotels are open for trading—is likely to have a larger impact and to provide a second day of respite.

As indicated above, in Tennant Creek there was little support for a complete ban on trading on a particular day, and there was already in place a reduction of trading hours on Sunday vis-à-vis other days of the week. Given this, Thursday was seen to be the

most appropriate day to implement a ban on package liquor sales as it was the day on which most social security entitlements and wages were paid. As well as being a focus for reduced consumption, it was reasoned that by prohibiting packaged liquor sales on that day some people would be more likely to spend money on foodstuffs and other grocery items than on alcohol. Thursday was selected as the day on which packaged liquor sales were prohibited in Derby for the same reasons.

In Tennant Creek, d'Abbs *et al.* obtained indexed weekly and Thursday sales data from Tennant Creek's only supermarket, for the period February 1995–January 1996. They found that there were no differences between the 13 weeks prior and the 13 weeks subsequent to the introduction of the trial restrictions (1996:30–32). While this limited data set showed no short-term increase in food sales, neither did it show the decline that some had predicted as a result of the cask-wine ban which would have necessitated drinkers spending more to obtain the same volume of alcohol. Assessment of the longer term impact of the restriction on Thursday packaged liquor sales was not possible because the proprietor of the supermarket declined to make sales figures available to either the evaluators at the time of the second evaluation of the Tennant Creek restrictions (Gray *et al.* (1998:36) or to the Liquor Commission (personal communication).

In Tennant Creek—recognising that excessive alcohol was a problem for the whole community—a coalition of Aboriginal and non-Aboriginal interests had begun a campaign to 'beat the grog' (Gray *et al.* 2000:39). It was recognised that proposed restrictions would have a disproportionate impact on the Aboriginal people—who comprised about 38 per cent of the total population (d'Abbs & Togni 2000:46). However, the coalition that pushed for restrictions was headed by two Aboriginal community organisations—Julalikari Council and Anyinginyi Aboriginal Congress—which were of the view that the differential impact was warranted if it would reduce the effects of alcohol misuse in their community.

In terms of any possible reduction of consumption and excessive harm, the greatest *overall* impact of the proposed restriction on Sunday packaged liquor sales in Port Hedland and South Hedland is likely to be in the non-Aboriginal population—simply because it comprises about 91 per cent of the total adult population. However, the proposed restriction is likely to have greater *proportional* impact on the Aboriginal population because a greater proportion of its members are likely to be reliant on packaged liquor sales and a greater proportion of its members who drink are likely to consume excessive amounts of alcohol. If the proposed restriction is to be effective and not contribute to divisions within the wider community, this differential impact must be acceptable to the majority of Aboriginal people in Port Hedland and South Hedland.

As indicated previously, McAllister found that public opinion in the wider population is evenly divided on moves to restrict the availability of alcohol and there was no majority support in Tennant Creek (Gray *et al.* 1998) or Alice Springs (Hauritz *et al.* 2000) for complete bans on Thursday trading. However, in Tennant Creek there has been majority support for the Thursday packaged liquor restrictions. In Tennant Creek, in 1998 Gray *et al.* found that 46 per cent of a population sample wanted to retain the restriction and a further 13 per cent wanted it strengthened (1998:21). In 2000, d'Abbs *et al.* found that this support remained virtually unchanged, with 46.8 per cent in favour of retaining the restriction and 15.2 per cent favouring modification of it—most commonly also applying it to licensed clubs (2000:36). On the basis of this, and recognition that the Thursday restrictions were being circumvented, the NT Licensing

Commission has retained these restrictions and—in a decision on the 17th December 2001—extended them to licensed clubs.

In the case of Derby, the level of support for Thursday packaged liquor restrictions is difficult to ascertain because of the different ways in which questions were asked of participants in a telephone survey and an un-representative sample of Aboriginal CDEP workers. d'Abbs and Togni claim that there appeared to be 'overall majority support' for the restrictions among Derby residents but reported divisions of opinion about the Thursday restrictions in Aboriginal communities (1997:48).

While there has been support for the restriction of Thursday packaged liquor sales in Tennant Creek, and apparently to a lesser degree in Derby, it is not possible to generalise from the attitudes of people there to those of Port Hedland and South Hedland. While it is clear that there has been considerable community action with regard to seeking some restrictions in general, there is no evidence one way or the other regarding the proportion of the community in Port Hedland and South Hedland that is in favour of the proposed restriction on Sunday packaged liquor sales. Such support is essential as, without it, individuals will actively seek to circumvent the restrictions and divisions within communities—especially between Aboriginal and non-Aboriginal Australians—can be exacerbated.

The evidence for the direct effect of restrictions on Thursday packaged liquor sales is not particularly strong. However, as indicated above, such restrictions have not been implemented in isolation and they are likely to have an interactive, synergistic effect. Unfortunately—given the circumstances in which restrictions have been introduced and evaluated—it is not methodologically possible to demonstrate this one way or the other.

Related to this, is the issue of the symbolic importance of restrictions. In both Tennant Creek and Alice Springs an explicit aspect of the introduction of restrictions has been to convey the message that the wider community in those towns will no longer tolerate high levels of alcohol misuse and related harm. It has been suggested that this message might actually have as much impact as the restrictions themselves, and that the more comprehensive the package of restrictions the stronger and more effective is the message. Some suggestive evidence for this comes from a comparison between Tennant Creek and Derby. In Tennant Creek—although some of the key restrictions were the same as in Derby—the package of restrictions was more comprehensive and has been considerably more effective. It would appear that to some extent this has galvanised community support and there is a greater willingness not only to comply with the restrictions but to address other aspects of the alcohol problem. Unfortunately, none of the evaluation teams have had the resources to explore this issue further.

Summary

Restrictions such as those proposed in Port Hedland and South Hedland, and implemented in towns such as Alice Springs and Tennant Creek and Katherine, have been introduced in response to acute problems and a pressing need to intervene. The magnitude of the problems means that—of necessity—interventions must be based on the best currently available evidence and precludes waiting for 'further studies'. When considering the results of the evaluations of these restrictions it must be borne in mind that—under such circumstances—controlled trials of the efficacy of restrictions are not an option. Evaluations have to take place in naturalistic settings and there are

limitations on what is feasible and this, in turn, places limitations on the evidence that can be obtained. Within these limitations, it is possible to draw some tentative conclusions about the impact of restrictions on the sale of packaged liquor on particular days of the week.

- Imposition of restrictions, and the relaxation of restrictions, on particular days have been shown to have some effect in decreasing or increasing alcohol-related harm.
- Total restrictions on days of sale do not have widespread public support.
- In some locations, there has been majority community support for restrictions on the sale of packaged liquor on particular days of the week.
- The limited evidence suggests that such restrictions have little direct effect on levels of consumption and indicators of alcohol-related harm.
- When implemented on days when social security payments and wages are paid, there is insufficient evidence to determine whether such restrictions result in the diversion of money from alcohol purchases to the purchase of food and other goods.
- In communities with high levels of alcohol-related disturbances, there is evidence that such restrictions contribute to some respite.
- As part of a wider package of restrictions, restrictions on the sale of packaged liquor on particular days sends a strong message to the community that excessive alcohol consumption and related harm is unacceptable and that this *may* lead to positive behaviour changes.
- Restrictions on the sale of packaged liquor *may* act in synergy with other restrictions to produce a positive effect that is greater than they would produce alone. However, this is difficult to demonstrate empirically one way or the other.



References

- Alice Springs Town Council. *Alice Springs Alcohol Availability Community Survey*. Contract No 99/2310.2. Alice Springs: Alice Springs Town Council, 1999.
- Brady M. (2000) Alcohol policy issues for indigenous people in the United States, Canada, Australia and New Zealand. *Contemporary Drug Problems* 27/Fall: 435–509.
- d'Abbs, P., Togni, S. & Crundall I. (1996) *The Tennant Creek Liquor Licensing Trial, August 1995 – February 1996: An Evaluation*. Darwin: Menzies School of Health Research and NT Living With Alcohol Program.
- d'Abbs, P. & Togni, S. (1998) *The Derby Liquor Licensing Trial: A Report on the Impact of Restrictions on Licensing Conditions Between 12 January 1997 and 12 July 1997*. Darwin: Menzies School of Health Research.
- d'Abbs P, Togni S. Liquor licensing and community action in regional and remote Australia: a review of recent initiatives. *Australian and New Zealand Journal of Public Health* 2000; 24 (1): 45–53.
- Edwards G, Anderson P, Babor S, *et al.* (1994) *Alcohol Policy and the Public Good*. Oxford: Oxford University Press.
- Gray D. (2000a) Indigenous Australians and liquor licensing restrictions (invited and refereed editorial) *Addiction* 2000: 95: 1469–1472.
- Gray D. (2000b) Comment on *Dollars Made from Broken Spirits*: A report prepared for Central Australian Aboriginal Congress and Tangentyere Council. Perth: National Drug Research Institute, Curtin University of Technology.
- Gray D, Chikritzhs T, Stockwell T. The Northern Territory's cask wine levy: health and taxation policy implications. *Australian and New Zealand Journal of Public Health* 1999; 23(6): 87–89.
- Gray D, Chikritzhs T. Regional variation in alcohol consumption in the Northern Territory. *Australian and New Zealand Journal of Public Health* 2000; 24(1): 35–38.
- Gray D, Siggers S. (2002) Submission to the Inquiry by the Director of Liquor Licensing into proposed restrictions on the sale of packaged liquor in Port Hedland and South Hedland. Perth: National Drug Research Institute, Curtin University of Technology.
- Gray D, Siggers S, Atkinson D, Sputore B, Bourbon D. *Evaluation of the Tennant Creek Liquor Licensing Restrictions: A Report Prepared for the Tennant Creek Beat the Grog Sub-Committee*. Perth: National Centre for Research into the Prevention of Drug Abuse, Curtin University of Technology, August 1998.
- Gray D, Siggers S, Atkinson D, Sputore B, Bourbon D. Beating the grog: an evaluation of the Tennant Creek liquor licensing restrictions. *Australian and New Zealand Journal of Public Health* 2000; 24(1): 39–44.
- Gruenewald PJ. (1993) Alcohol problems and the control of availability: theoretical and empirical issues. In US Department of Health and Human Services. *Economics and the Prevention of Alcohol-Related Problems*. Research Monograph 25. Washington, DC: US Department of Health and Human Services, Ch 3: 59–90.

- Hauritz M, McIlwain G, Finnsson F. (2000) *Dollars Made From Broken Spirits. Alice Springs: Determining its Well-Being and Responsible Alcohol Management as Part of Everyday Life. A Whole of Community Deal*. Brisbane: Hauritz and Associates.
- Ligon J, Thyer B. (1993) The effects of a Sunday liquor sales ban on DUI arrests. *Journal of Alcohol and Drug Education* 38 (2): 33–40.
- McAllister I. (1995) Public attitudes to the regulation of alcohol. *Drug and Alcohol Review* 14: 179–186.
- Makela P, Rossow I, Tryggvesson K. (2002) Who drinks more or less when policies change: the evidence from 50 years of Nordic studies. In Room R (ed.). *The Effects of Nordic Alcohol Policies: What Happens to Drinking and Harm When Alcohol Controls Change*. Helsinki: Nordic Council for Alcohol and Drug Research,
- Nordlund S. (1985) Effects of Saturday closing of wine and spirits shops in Norway. Paper presented at the 31st International Institute on the Prevention and Treatment of Alcoholism, Rome, Italy, June 2–7. SIFA Mimeograph No 5/85. Oslo: National Institute for Alcohol Research.
- Olsson O, Wikstrom P-O. (1982) Effects of the experimental Saturday closing of liquor retail stores in Sweden. *Contemporary Drug Problems* 11/Fall: 325–353.
- Olsson O, Wikstrom P-O. (1984)
- Smith DI. (1978) Impact on traffic safety of the introduction of Sunday alcohol sales in Perth, Western Australia. *Journal of Studies on Alcohol* 39 (7): 1302–1304.
- Smith DI. (1987) Effect on Traffic Accidents of Introducing Sunday Alcohol Sales in New South Wales, Australia. *Contemporary Drug Problems* 14: 279–294.
- Smith DI. (1988) Effect on traffic accidents of introducing Sunday alcohol sales in Brisbane, Australia. *International Journal of the Addictions* 23 (10): 1091–1099.
- Smith DI. (1990) Effect on casualty traffic accidents of changing Sunday alcohol sales legislation in Victoria, Australia. *Journal of Drug Issues* 20(3): 417–426.