Abstract — A preliminary study was conducted to examine the nature and extent of urban–rural differences in self-reported drinking and driving among youths in Western Australia. A total of 102 youths aged 17, 18 and 19 years were surveyed via a random street sampling technique about their alcohol consumption and drink-driving behaviour. Analyses indicated that urban youths had a significantly higher level of self-reported drink-driving behaviour than their rural counterparts. Males indicated a higher level of self-reported drink-driving behaviour than females. This article also provides a review and summary of youth drink-driving literature with special focus on urban–rural comparisons.

INTRODUCTION

Youth drink-driving in Australia

Within Australia, road traffic fatalities are the single largest cause of death of young adults aged 15 to 24 years. Similarly, this young age group seems to be over-represented in general road fatalities, with people aged 17 to 25 years contributing to over half of all those alcohol-related deaths on the roads (Loxley et al., 1992). According to these authors, the high incidence of youth fatalities may be inevitable. Alcohol consumption in Australia is firmly embedded in recreational, social, and leisure activities. Young people seem to be part of this ‘drinking culture’, as they frequently engage in drinking behaviour which is often followed by drink-driving (Loxley et al., 1992).

In a recent study of 1389 fatally injured vehicle occupants in South Australia, Holubowycz et al. (1994) found that, between 1985 and 1992, 45% of car drivers and 36% of motorcyclists had a positive blood-alcohol concentration (BAC). The mean BAC of the fatally injured drivers and riders was 169 and 130 mg/dl respectively (Holubowycz et al., 1994).

In Western Australia (WA) (Beel and Stockwell, 1995), the level of drinking and driving has decreased appreciably since 1986. Results of a survey that year indicated that 56% of women and 77% of men had driven after consuming alcohol. This decrease in observed drink-driving has been attributed to increased police random breath testing (RBT) activity, health education, and public media campaigns (Beel and Stockwell, 1995).

Comparisons between Queensland (QLD) and WA have been in terms of self-reported drink-driving behaviour. There have been clear indications that ‘WA lags behind Queensland in terms of drink driving attitudes and behaviours possibly due to Queensland having had a 0.05 BAL (50 mg/dl limit) since 1982’ (Beel and Stockwell, 1995). Greater enforcement of drink-driving laws has been in operation in QLD for more than a decade, and interpretation of results has indicated a reduction of reported drink-driving behaviour. Since 1986, however, reported WA drink-driving behaviour has more than halved (27%), which has highlighted the benefits of RBT and public media campaigns (Beel and Stockwell, 1995).

Even though interpretations of the most recent research have indicated a reduction in drink-driving behaviour, an over-representation of young drivers in alcohol-related fatalities has continued to constitute a challenge for public health educators.
Urban–rural drink-driving in Australia

Stockwell et al. (1991) measured the effect of RBT on drink-driving behaviour. With a total of 496,035 drivers stopped for RBT in WA, 304,588 (63%) were in the Perth metropolitan area and 191,447 (37%) were in rural areas. Of the total number of drink-driving charges laid, most (66%) were rural. This study, however, only included drivers aged 30 to 59 years, and therefore the results are limited, as the high-risk young male group was omitted.

In a more recent study, Beel and Stockwell (1995) examined the effectiveness of RBT on drink-driving behaviour in WA. Although urban–rural differences were not the main focus of the study, some valuable statistics were generated. Interpretations of results indicated that rural drivers were more likely to drink-drive when compared to urban drivers, although the differences were not large enough to be statistically significant. In addition, 42% of urban drivers reported abstinence from alcohol if they were driving, while only 35% of rural drivers reported this behaviour (Beel and Stockwell, 1995).

Past research has repeatedly shown that youths (and particularly males) have been at a higher risk of injury from drink-driving. No conclusions were, however, made about youth drink-driving behaviour from Beel and Stockwell’s (1995) study. Therefore, field data are required for a sample from WA.

Although laws have been ‘toughened’ and fines have been increased, drink-driving still remains a major problem in WA. The influence of mandatory convictions for drink-driving behaviour remains unknown. Details about age, gender and perhaps BAC levels represent the only information likely to be obtained through reports given by arresting police officers in a drink-driving situation (Davis, 1987; cited in Hayes and Swisher, 1991). Therefore, as Hayes and Swisher (1991) have indicated, the best source for knowledge about drink-driving behaviour may come from self-reported information gained from surveys.

The present investigation therefore examined the self-reported drink-driving behaviour of teenagers aged 17 to 19 years with a special focus on urban–rural differences. This age cohort was examined, as they are among the most ‘at risk’ group for drink-driving fatalities. The present research examined two hypotheses: (1) rural youths would report significantly higher levels of drink-driving behaviour than their urban counterparts; and (2) males would report significantly higher levels of drink-driving behaviour than females. The first hypothesis is supported by research conducted by Stockwell et al. (1991) and Beel and Stockwell (1995) that demonstrated how rural drivers (but not specifically youths aged 17–19 years) were more likely to drink-drive and be charged with the offence, compared to urban drivers. The second hypothesis is supported by research carried out on gender differences (see, e.g. Farrow and Brissign, 1990; Yu et al., 1992).

SUBJECTS AND METHODS

Participants

One hundred and two participants (38 youths aged 17 years, 34 aged 18 years, and 30 aged 19 years) agreed to participate in the investigation. The youths were surveyed across four separate locations in WA, two urban (Perth city and Fremantle) and two rural (Bunbury and Busselton).

Materials

The questionnaire structure and content were developed by the National Centre for Research into the Prevention of Drug Abuse (NCRPDA) in consultation with the WA Police Service and other researchers. Principal component analysis was applied to investigate the structure of the questionnaire items and to summarize the data empirically. In previous research using the questionnaire (Beel and Stockwell, 1995), the results of separate principal component analyses for WA and QLD were very similar. According to Beel and Stockwell (1995) ‘this demonstrates that the questionnaire has content validity and confirms the reliability of the questionnaire across the two states’ (p. 8).

The original questionnaire described by Beel and Stockwell (1995) was adapted for the present study. As the original questionnaire was developed for telephone surveys, some minor structural modifications were required. Furthermore, some items were deleted, because they were not appropriate for the purpose of the present investigation (e.g. questions regarding RBT).
From the original questionnaire developed by Beel and Stockwell (1995), two gender-specific questionnaires were developed, with the final versions of the questionnaires consisting of 15 items. The items consisted of demographic questions (gender, age, and occupation), multiple-choice questions, and yes–no questions.

The final versions of the questionnaires (available from the corresponding author) were pilot-tested on 10 participants (5 male, 5 female). Minor amendments were made subsequently to the wording of some questions. The combined male and female questionnaire items are shown in Table 1.

**Table 1. Combined male and female questionnaire items**

<table>
<thead>
<tr>
<th>Demographic information (gender, age, and occupation)</th>
<th>How many standard drinks are consumed on a typical day when you’re drinking?</th>
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<tbody>
<tr>
<td>How often do you consume a drink containing alcohol?</td>
<td>How often do you consume six or more drinks containing alcohol in a day?</td>
</tr>
<tr>
<td>When you drink alcohol, what do you mainly drink (beer, wine, spirits, or cocktails)?</td>
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<tr>
<td>In the last 2 weeks have you consumed any alcohol and then driven a vehicle?</td>
<td>In the last 6 months how many times have you have two or more drinks (females) or three or more drinks (males) in the first hour, and then driven?</td>
</tr>
<tr>
<td>Have you ever been convicted of a drink driving offence?</td>
<td></td>
</tr>
<tr>
<td>In Western Australia what is the current legal blood-alcohol level for fully licensed drivers of private vehicles?</td>
<td>In Western Australia what is the current legal blood-alcohol level for probationary drivers of private vehicles?</td>
</tr>
<tr>
<td>In the last 6 months how many times have you consumed any alcohol and then driven?</td>
<td></td>
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<tr>
<td>Have you ever been convicted of a drink driving offence?</td>
<td></td>
</tr>
<tr>
<td>In Western Australia what is the current legal blood-alcohol level for fully licensed drivers of private vehicles?</td>
<td>Do you have a current driver or motorcycle licence?</td>
</tr>
</tbody>
</table>

**Procedure**

The urban and rural locations chosen for this investigation were based on population statistics. The general convention held in the USA is to treat an area with a population of more than 50,000 as a metropolitan (urban) area (Room, 1990). Conversely, non-metropolitan areas (rural) have been characterized as having populations of less than 50,000 people (Alvarez *et al.*, 1991). The two urban locations used in the present research included the city of Perth and the city of Fremantle in WA. Approximately 1.3 million people reside in these locations. The two rural locations used in the study (Bunbury and Busselton) have approximately 27,000 and 18,000 inhabitants respectively.

All eligible respondents (aged 17–19 years, and residing in the appropriate urban–rural location) were approached in the street and requested to participate in the survey. If the participant was not aged 17, 18 or 19 years, they were given an explanation about the age-specific nature of the survey, thanked for their time, and not included in the data collection. Eligible participants were instructed that the aim of the survey was to gather information about youth drink-driving behaviour. The participants were left alone to complete the questionnaire, which was then collected by the researcher. All data were collected between 11 June and 20 August 1996. Eleven participants (8 male, 3 female) from the urban locations declined to participate in the study. Four participants (1 male, 3 female) from the rural locations declined to participate.

**RESULTS**

Table 2 lists the frequency of alcohol consumption among urban and rural youth. The rural youths indicated that 42.3% drank ‘two to three times a week’. In comparison 62% of the urban youths indicated that they drank ‘two to three times a week’.

When asked how many standard drinks they consumed on a ‘normal’ drinking occasion, no differences were found between the two youth samples. The mean number of drinks for all youths sampled was seven. The average number of drinks a female consumed was five, whereas the average number for males was 10.

Of the rural sample, the preferred alcohol beverage was beer (51.9%), with spirits second (34.6%), wine the third most popular (3.8%), and cocktails not consumed at all. Similar results were indicated by the urban sample, with beer the most preferred alcohol beverage (56%), spirits the second most popular (38%), wine third (6%), and cocktails not consumed.

**ANOVA** was used to compare the urban and rural locations for self-reported drink-driving behaviour. Interpretation of results indicated a highly significant difference between the group means. Of those youths sampled, the urban population indicated significantly higher levels...
of drink-driving than their rural counterparts \( F (1,100) = 13.968, P < 0.01 \).

A second ANOVA was used to compare males and females for self-reported drink-driving behaviour. Interpretation of results indicated a significant difference between the group means. Of those youths sampled, the male population indicated significantly higher levels of drink-driving than females \( F (1,100) = 4.419, P < 0.05 \).

Summary statistics were used to generate percentages regarding the youth sample. Of the 52 rural youths sampled, 86.5% had a current driver’s licence. In comparison, 90% of the urban youth sample had a current driver’s licence. Therefore, of the entire sample, 11.8% had either not received a driver’s licence or had had their licence suspended.

When asked how often they would arrange a ‘skipper’ (designated driver), 57.7% of the rural sample replied ‘always’, and 40.4% replied ‘usually’. In comparison, the urban sample indicated that they would ‘always’ arrange a skipper 56% of the time, ‘usually’ arrange a skipper 40% of the time, and ‘sometimes’ arrange a skipper 2% of the time.

Table 2 outlines the youth samples’ drink-driving behaviour. When asked about their drink-driving behaviour, 38.4% of the rural sample indicated that they abstained from drinking any alcohol when driving. In comparison, 22% of the urban sample indicated that they abstained from drinking alcohol when driving.

When asked about the legal blood-alcohol level for probationary drivers (20 mg/dl), 84.6% of the rural sample answered correctly and 100% of the urban sample answered correctly. When asked the legal blood-alcohol level for fully-licensed drivers (50 mg/dl), 76.9% of rural respondents answered correctly, and 92% of urban youths answered correctly.

**DISCUSSION**

The present research used a self-report measure to investigate urban–rural differences in drink-driving behaviour among youths aged 17, 18 and 19 years. It was hypothesized that rural youths would drink-drive more often than their urban counterparts. This hypothesis was not confirmed by the data analysis. Rather, results indicated the opposite; urban youths reported significantly higher levels of drink-driving than the rural population.

This finding corresponds with much of the

<table>
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<th>Table 2. Urban–rural comparisons of alcohol consumption</th>
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<tr>
<td>Frequency of alcohol consumption</td>
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<tr>
<td></td>
</tr>
<tr>
<td>Never</td>
</tr>
<tr>
<td>Once a month or less</td>
</tr>
<tr>
<td>Two to four times a month</td>
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<tr>
<td>Two to three times a week</td>
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<tr>
<td>Four or more times a week</td>
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<td>Total</td>
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<th>Table 3. Urban–rural comparisons of drink-driving behaviour</th>
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<tr>
<td>Frequency of alcohol consumption</td>
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<tr>
<td></td>
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<tr>
<td>Abstinence from drinking and driving</td>
</tr>
<tr>
<td>Restricted drinking when driving</td>
</tr>
<tr>
<td>Did not consume alcohol</td>
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<tr>
<td>Total</td>
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</table>
Research completed with North American samples, where city youths consumed more alcohol than youths in other locations. Little and Clontz (1994) indicated that under-age drinking (in the USA) is more prevalent in 'higher urbanised areas where there exist ... greater leisure time, greater peer group pressure to drink and cultural acceptance of drinking.'

Although studies have indicated that urban—rural differences in self-reported drink-driving behaviour exist, few studies have examined the reasons for these differences. In an examination of urban, rural, and semi-rural Alaskan youth, Segal (1994) discovered significant differences, largely attributable to variations in age of first use of alcohol and marijuana, racial group effects, and gender differences specific to initiation into drug use. Additional research efforts in Australia should attempt to examine the underlying reasons for these differences.

The second hypothesis tested was that males would report significantly higher levels of drink-driving behaviour than females. This hypothesis was confirmed by the analysis. Moreover, males indicated that 58.8% had consumed more than three drinks in the first hour and then driven, whereas females indicated 41.2%. Both figures were very high, and may indicate the high prevalence of drink-driving among youths in WA.

Current literature on gender differences has indicated similar trends. Several studies (Hollinger, 1984; Downs, 1987; Smith and Remington, 1989) showed that women are approaching men, in terms of their alcohol use and drink-driving behaviour. In these studies, however, it was concluded that self-report studies still show that men exceed women both in frequency and quantity of drinking and driving.

The analysis of the data indicated that, of the youths sampled, over 90% consumed alcohol at least twice a month. These results indicated a high alcohol consumption rate among those teenagers sampled in WA. This finding may reflect the high incidence of 'binge drinking', reported by Binns et al. (1987) among youths in Australia.

When asked how often they would arrange a 'skipper' (designated driver), approximately 45% of the sample indicated they did not arrange alternate means of transport when they were drinking. This finding indicated that many of the youths sampled were not planning ahead for alternate means of transport. In addition, when asked about their drink-driving attitudes, two-thirds of the youths sampled indicated that they would consume some alcohol when they were driving. Taken together, these findings indicated a lack of abstinence and lack of planning and may explain the high incidence of drink-driving in WA.

Moreover, when asked about the legal blood-alcohol level for both probationary and fully-licensed drivers, some youth were unclear about present laws. This finding highlights the point that further education about legal BACs is required, so that youths can adhere to the law.

Several confounding variables may have contributed to the present findings. Data were collected for one-fifth of the sample (20 urban youths) during school holidays. The remaining sample was collected during the regular school term, and thus drinking patterns may have been influenced, creating a sampling bias. In future research efforts should attempt to control for this factor.

A second factor that should be considered is representativeness. The present research was a preliminary investigation based on the survey information of 102 respondents. In future, a larger sample would seek to obtain representativeness.

A final factor that may have influenced the present findings was the use of a self-report drink-driving measure. Some researchers question the validity of self-report measures. For example, Midanik (1982) and Laing (1988) noted the inconsistency of results of studies using self-report methods. Midanik (1982) concluded that more emphasis should be placed on developing new ways to validate alcohol consumption. Currently, methods other than self-report may be very time-consuming and costly for researchers, with no improvement in fidelity.

The findings of the present investigation reflected a high rate of drink-driving among youths in WA. Several authors have made suggestions for ways of dealing with this 'problem' of youth drink-driving. Reducing the availability of alcohol to youths, increasing fines and penalties, and introducing engineering restrictions (e.g. disabling devices on motor vehicles to restrict access if the driver has been drinking 'too much') are among the suggestions (Loxley et al., 1992). Moreover, these latter authors proposed the use of RBT to enforce restrictions on all drivers.
Results of RBT have indicated reduced alcohol-related injuries and fatalities. However, alternative procedures are still required to produce faster results.

Educational programmes aimed at reducing alcohol use by youths have had at best limited success (Williams et al., 1986). Rather than attempting to reduce alcohol consumption, programmes aimed at informing youths may yield better results. Such programmes should provide knowledge of legal BAC levels, knowledge of the number of standard drinks that put a person over the legal limit for driving and knowledge about standard drinks in general.

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