What are the offence and offender risk factors for Indigenous repeat drink drivers in Queensland Australia?

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Abstract.

In Australia and internationally, there is scant information about Indigenous repeat drink drivers. The aim was to identify the risk factors associated with repeat offending. De-identified data on drink driving convictions by offenders identifying as Indigenous in Queensland between 2006 and 2010 were examined. A range of univariate analyses were used to compare first time and repeat offenders on gender, age, court location and region (based on the accessibility/remoteness index of Australia), blood alcohol concentration and sentencing severity. Multivariate logistic regression adjusted for confounding variables. Convictions for repeat offenders were more likely from locations other than 'major cities' with the association strongest for courts in the 'very remote' region (OR=2.75, 2.06-3.76, p<.001). Indigenous offenders 40 years or older were found to be at reduced risk in comparison to offenders aged 15-24 years (OR=0.68, 0.54-0.86, p=0.01). After controlling for confounding factors, gender, sentencing severity and blood alcohol concentration levels were not significantly associated with recidivism. The association of recidivism and remoteness is consistent with higher rates of alcohol-related transport accidents involving Indigenous Australians in isolated areas. This study provides a platform for future research and allows for early attempts to address the need for intervention to reduce Indigenous drink driving recidivism.

Keywords: Indigenous, drink driving, recidivist,

1. Introduction

Road crashes are a serious road safety issue for contemporary Indigenous Australians and contribute to the existing health gap between this group and the wider population [1].[1] For Indigenous peoples, both in Australia and internationally, drink driving contributes to high road injury rates [1-4] with a large proportion of these injuries attributable to road crashes caused by drink drivers who have multiple previous drink driving convictions [5]. In Australia, recent studies specifically investigating the predictors of repeat drink driving offending, have identified that being of Indigenous background is a significant predictor [6,7]. Preliminary estimates of Indigenous drink driving recidivism in Western Australia report that Indigenous people account for 28 percent of offenders, defined in that study as having been convicted of drink driving for the third time [8], yet only represent 3.5 percent of the state's population [9]. It may be that differences in the patterns of alcohol consumption for Indigenous peoples compared to non-Indigenous underlie or exacerbate this overrepresentation. Recent studies on alcohol consumption among Indigenous populations suggest that, while fewer Indigenous Australians as a whole consume alcohol [10], those who do are more likely than other Australians to consume at rates that are characterised as 'risky' or 'high risk' [11]. Identification of risk factors for mainstream repeat drink driving offending has received significant attention and this has enabled both the effective design of countermeasures and policy development. However to date, little is known about the characteristics of their Indigenous counterparts.

The principal paradigm guiding the development of many drink driving countermeasures such as imposition of financial penalties and licence disqualification is deterrence theory [12]. However, research has consistently shown that many repeat drink driving offenders are not receptive to the threat of legal sanctions, and continue to offend. For Indigenous drink drivers, licence disqualification as a result of a drink driving conviction often leads to further driving-related offences including unlicensed driving [13,14]. This is of particular concern in remote areas where there are no public transport systems. The lack of alternatives to private vehicle use is a serious social justice issue, as it contributes to higher numbers of driving-related arrests and to the overrepresentation of Indigenous peoples in incarcerated populations.

Over the last three decades rehabilitation programs have been developed as an alternative approach to legal sanctions. These programs vary considerably in content, but can be classified broadly as 'educational' (to improve knowledge, attitudes and skills), 'therapeutic' (involving psychotherapy) or a combination of both. Remedial programs for recidivist offenders attempt to address the high levels of self-reported alcohol misuse and dependence [15], as well as those personality traits associated with drink driving offending more generally such as poor impulse control. In relation to effectiveness, the most promising results come from rehabilitation programs that combine elements of education, therapy and follow-up contact (e.g. probation supervision). Evaluations of programs suggest that combining completion of a program with licensing sanctions, is more effective in reducing recidivism among repeat offenders than imposing licensing sanctions alone [16]. However, the current programs in Australia are primarily designed for and informed by research of mainstream offenders in urban settings, and may not useful for Indigenous Australians. For instance, differences in contextual factors surrounding unlicensed driving exist for Indigenous peoples in Australia, particularly for those who live in more remote locations such

[1] Indigenous Australians refers to peoples who identify as Australian Aboriginal and/or Torres Strait Islander

as pressure to fulfil kinship obligations [13], and the same may exist for drink driving among Indigenous Australians. This notion is supported by research internationally, where there has been more attention towards drink driving in Indigenous communities and therefore greater understanding of the factors that facilitate it [17]. Such research indicates that similar kinship obligations, along with other differences in contextual factors, when compared to mainstream drink drivers, exist as well as demonstrating the need for suitable strategies for this population.

In summary, the issues and shortcomings identified above have meant a dearth of literature pertaining to the profiling of offender and offence characteristics for Indigenous repeat drink drivers. Moreover, there is little understanding of the cognitions of Indigenous repeat drink drivers or the contextual factors which may contribute to or exacerbate Indigenous drink driving. In light of this limited understanding, the current study aimed to: i) quantify Indigenous repeat drink driving in Queensland between 2006-2010; and ii) compare the demographic characteristics and offence details of first time Indigenous offenders with those Indigenous offenders who commit multiple drink driving offences. As the official court records now permit offenders to identify their Indigenous status it is possible to separate data on this basis. Thus the study is timely in that it possible to attempt to identify factors that may be significant in predicting Indigenous drink driving recidivism.

2. Method

2.1 Description of Data

Records of persons prosecuted in Queensland for driving under the influence of alcohol between 1 January 2006 and 31 of December 2010 were obtained from the Department of Justice and Attorney-General, Brisbane, Australia. The dataset included the following offence variables of interest: date of offence and conviction, charge number, sentencing court location, offence code, and sentencing outcome description. It also included the following offender details, namely date of birth, gender and self-identified Indigenous status. The data were de-identified with each conviction assigned a unique case number. The Queensland University of Technology Ethics Committee approved this study (Approval number: 1100000636).

2.2 Data Management

Using the Indigenous status field, all convictions for drivers who did not self-identify as an Indigenous person were removed. Evaluations of information collection for Indigenous status have noted some issues with utilising Indigenous status including limited understanding of the reasons for collecting data and the uses of data, non-use of the standard Indigenous status question, lack of quality assurance measures and a perception of reluctance among Aboriginal and Torres Strait Islander peoples to disclose their Indigenous status [18]. In addition, all matters that did not result in a conviction (n=128), or had missing data for variables of interest (gender missing n=1; age missing n=5) were excluded. Convictions for people under the age of 15 years were also excluded from analysis (n=18).

From a legal standpoint in Queensland, the term “recidivist” refers to an individual who has incurred more than one drink driving conviction in the last five years [19]. As the data was de-identified, deterministic linkage was used to match individuals to multiple convictions. Date of birth, gender, specific Indigenous status (Aboriginal, Torres Strait Islander or both

Aboriginal and Torres Strait Islander) and sentencing court location were used to match convictions committed by the same individual. Completing this linkage technique is usually conducted to identify individuals within multiple data sources. Studies linking de-identified data have found linkage techniques to identify individuals within data to have high specificity, however sensitivity is dependent on the number of variables and has been found to range from 60.4-96.1%, dependent on the number of variables used [20]. All offenders were assigned a code on the basis of number of offences to distinguish the repeat offenders (value=1) from first offenders (value=0). The offences of individuals classified as repeat drink drivers were arranged in chronological order, and the data related to the first offence was then used to conduct the statistical comparisons with first time offenders. Within the current data, some repeat offenders who committed more than one offence did so prior to the court determination for the first offence. Because this means that those offenders would not have been exposed to the intended deterrence of sentencing for the first offence before committing the subsequent offence, they were excluded from this analysis (n=298) as a primary focus is on effective methods of deterring Indigenous offenders.

The authors of the study acknowledge there are limitations with identifying repeat offenders in the manner described which utilises a 5 year period of data only. This method has been adopted due to the commencement date for self-identification of Indigenous status within the Department of Justice and Attorney-General official records. Data for this field is not available for records prior to 2006. Therefore, some offenders categorised in this study as first time offenders may have had a recorded conviction prior to 2006. This limitation will be discussed further in the discussion.

2.3 Classification of court location, blood alcohol concentration offence level and sentencing severity for the analysis

The legal breath alcohol limit for driving in Australia varies according to class of licence or restrictions. It is 0.00g/100ml for licensed drivers on provisional or probationary licences and professional drivers (i.e. taxi and truck drivers), but between 0.01g/100ml and 0.049g/100ml for drivers on an open, full licence [21]. For this study three categories of BAC were used to classify the offence for which an individual driver was prosecuted. These correspond to the legal classifications of BAC offences, and are: above the zero limit (0.01-0.049g/100ml); the general alcohol limit (0.05-0.149g/100ml); and, the high range alcohol limit ($\geq$ 0.15g/100ml). Since the data for this study was supplied, the legislation for BAC limits has changed in Queensland to include a fourth category of BAC offence, referred to as mid-range (0.10-0.15g/100ml) [21].

As a higher number of alcohol-related road crashes amongst Indigenous peoples occur in remote areas in comparison to metropolitan and regional areas, location of the offence was regarded as important in this analysis. However, the supplied data did not record the location of the offence, so the location of court of the conviction was used as a proxy for this. The majority of cases in the data had a short period of time between the offence and conviction date, suggesting that these matters were dealt with in a timely manner by the court in the region the offence occurred rather than being transferred to another court. For this research, the accessibility/remoteness index of Australia (ARIA+) was used to allow exploration of associations between remoteness and drink driving behaviour [22]. The ARIA+ was used to categorise court locations into five levels of remoteness, ‘major cities’, ‘inner regional’, ‘outer regional’, ‘remote’ and ‘very remote’. The ARIA+ has been used previously in road safety and public health research [23-25].

With regard to the location of the offence, it is also essential to recognise alcohol sale and consumption legislation varies across Queensland. Alcohol management plans were introduced in remote Indigenous communities in Queensland during 2002 and 2003 in response to high rates of alcohol-related injuries. These plans are initiatives that involve local community justice groups (statutory bodies consisting of Indigenous Elders and others) in partnership with government agencies. Plans consist of a three-tiered approach including supply reduction strategies in collaboration with demand and harm reduction strategies. The supply reduction strategies are the main component and contain alcohol possession and sale limits [26].

After several years of operation, a review of the alcohol plans was conducted. As positive outcomes associated with supply reduction were identified, there was a tightening of the alcohol restrictions in these plans, with alcohol prohibited in some remote Indigenous communities from 2008. It is not the purpose of this study to explore what effect these tighter alcohol restrictions have had on repeat drink driving, as the analysis will not be specifically investigating changes at an individual court level. However, the study does acknowledge these differences in alcohol sale and carriage legislation across Queensland and differing enforcement of alcohol restrictions in remote Indigenous communities. The majority of these communities are classified as being 'very remote' according to ARIA+ classification.

The Penalties and Sentencing Act of Queensland provides judicial discretion at sentencing, and the deterrent effect of different penalties may differ. We were therefore interested in examining whether severity of the penalty had an impact on reoffending and created a code to categorise the severity of sentences. Sentences were categorised in order of sentencing severity, specifically 'convicted not further punished', 'other' (such as, victim compensation), 'monetary fine', 'community based order' (including probation, community service and intensive corrections), 'suspended sentence' and 'imprisonment'. For repeat offenders the sentencing outcome for the first offence was used for the comparison to first offenders.

For general criminal offences, rates of recidivism are higher for Indigenous males than for Indigenous females and higher for those whose first court appearance occurs when they are younger compared with those who are older [27]. Hence initial analyses were completed separately for males and females; and for three age brackets (15-24 years; 25-39 years and 40+ years). In the course of the study, when age is referred to, it the age of the offender at first offence that appears in this data.

2.4 Data Analysis

Data were entered and coded into the Statistical Package for the Social Sciences, version 18.0 (SPSS Inc., Chicago, IL). Chi-square analyses were conducted to compare first time and repeat (multiple convictions within the 5 year period for which data was supplied) offenders with risk factors, namely gender, age at first offence, BAC, geographical region (according to the ARIA+ classification of location of the court where the conviction was recorded) and sentencing severity. To identify cell differences within the analyses, standardised adjusted residuals were calculated for each cell in order to determine cell differences that contributed to the chi-square test results. Values greater than 2.0 are reported on. The risk factors were then subject to univariate and multivariate logistic analyses. Risk factors entered into the model were age (15-24 years; 25-39 years; and, 40+ years), gender, BAC category (<0.05g/100ml; 0.05-0.149g/100ml; and, ≥ 0.15g/100ml), geographical region ('major cities'; 'inner regional'; 'outer regional'; 'remote'; and, 'very remote'), and sentencing severity

('convicted not further punished', 'other', 'monetary fine', 'community based order', 'suspended sentence' and 'imprisonment'). Odds ratios were calculated with 95% confidence intervals (CI) [28]. Lastly, for offenders categorised as repeat offenders within this study, the time between first conviction and date of the second offence is reported.

3. Results

3.1 First Offenders versus Repeat Offenders

Demographic characteristics for the sample are displayed in Table 1. As shown, of the 7,834 Indigenous drink drivers, 7,128 were categorised as first time and 706 were repeat offenders, meaning there was a 9% recidivism rate. The majority of first and repeat offenders were male, 75% and 78% respectively. The median age of first time male and female offenders was 43 years (range: 15-81) and 46 years (range: 15-65), respectively. For repeat offenders the median age of male offenders was 28 years (range: 15-62), and 28 years also for female repeat offenders (range: 15-56). Comparisons on the basis of age at first offence show statistically significant differences between first time and repeat offenders for both males (χ^2 =7.64, df = 2, p=0.02), and females (χ^2 =6.59, df = 2, p=0.03). Adjusted standardised residuals revealed male repeat offenders were more likely to be 15-24 years than 40 year or older compared to their first offender counterparts. For females, adjusted standardised residuals revealed a significantly higher rate of re-offenders between 25-39 compared to offenders aged 40 years and older.

Examining the BAC of the first offence, a significantly greater proportion of male repeat offenders were convicted for offences in the high range BAC ($\geq$ 0.15mg) category compared to first time male offenders (χ^2=6.49, df = 2, p=0.04). This pattern was not evident for female offenders (χ^2=3.36, df = 2, p=0.18).

Remoteness of the court location was found to be strongly significantly associated with repeat offending for both males (χ^2=48.75, df=4, p<0.001) and females (χ^2=15.30, df=4, p<0.001). Adjusted standardised residuals showed a larger proportion of repeat offenders located in the 'remote' and 'very remote' areas compared to their 'major cities' court location counterparts. For females, adjusted standardised residuals revealed a similar trend with repeat offenders more likely to be convicted in 'outer regional' and 'remote' areas compared to 'major cities' court locations.

The principal penalty imposed at sentencing was monetary for 80% of both first and repeat offenders regardless of gender. The second most common penalty for all groups was community based order (10%). Overall, there were no differences detected between first and repeat offenders in terms of sentencing severity either for males (χ^2=5.76, df =5, p=0.33), or for females (χ^2=3.63, df=5, p=0.60).

Table 1. Characteristics of first time versus repeat Indigenous drink drivers in Queensland Courts between 2006 -2010 at index offence

RISK FACTOR	FIRST TIME			REPEAT			TOTAL (100%)
	Males n (%)	Females n (%)	Total n (%)	Males n (%)	Females n (%)	Total n (%)	
BAC							
<0.05g/100ml	228 (4.3)	94 (5.3)	322 (4.5)	29 (5.2)	3 (2.0)	32 (4.6)	354
0.05-<0.15g/100ml	3,005 (56.0)	1,138 (64.7)	4,143 (58.1)	280 (50.5)	99 (65.5)	379 (53.6)	4,522
≥ 0.15g/100ml	2,134 (39.7)	529 (30.0)	2,663 (37.4)	246 (44.3)	49 (32.5)	295 (41.8)	2,954
Region							
Major Cities	1,145 (21.4)	430 (24.4)	1,575 (22.1)	61(11.0)	18 (11.9)	79 (11.2)	1,651
Inner Regional	851 (15.8)	282 (16.0)	1,133 (15.9)	91 (16.4)	24 (15.9)	115 (16.3)	1,248
Outer Regional	1,878 (35.0)	605(34.4)	2,483 (34.8)	190 (34.2)	64 (42.4)	254 (35.9)	2,737
Remote	660 (12.3)	237 (13.5)	897 (12.6)	83 (15.0)	29 (19.2)	112 (15.8)	1,009
Very Remote	833 (15.5)	207 (11.8)	1,040 (14.6)	130 (23.4)	16 (10.6)	146 (20.8)	1,186
Age							
15-24 years	1,862 (34.7)	589 (33.4)	2,451 (34.4)	236 (42.5)	46 (30.5)	282 (40.0)	2,733
25-39 years	2,405 (44.8)	847 (48.8)	3,252 (45.6)	226 (40.5)	87 (57.6)	313 (44.3)	3,565
40+ years	1,100 (20.5)	325 (18.5)	1,425 (20.0)	93 (17.0)	18 (11.9)	111 (15.7)	1,536
Total	5,367 (75.3)	1,761 (24.7)	7,128	555 (78.6)	151(21.4)	706	7,834

Table 2. Risk factors (Crude and adjusted odds ratios) of repeat drink driving offending

RISK FACTOR	Crude	95% CI	P value	Adjusted	95% CI	P value
Gender						
Female (reference)						
Male	1.21	1.00-1.45	0.05	1.16	0.97-1.40	0.11
Region						
Major Cities (reference)						
Inner Regional	2.02	1.50-2.72	<.001	1.97	1.47-2.63	<.001
Outer Regional	2.04	1.57-2.64	<.001	2.10	1.63-2.71	<.001
Remote	2.49	1.84-3.35	<.001	2.53	1.88-3.39	<.001
Very Remote	2.79	2.10-3.72	<.001	2.71	2.04-3.61	<.001
Age						
15-24 years (reference)						
25-39 years	0.89	0.75-1.06	0.21	0.89	0.75-1.06	0.11
40+ years	0.73	0.58-.917	0.01	0.73	0.57-0.91	0.005
BAC						
<0.05g/100ml	1.08	0.74-1.58	0.66	1.00	0.69-1.48	0.96
0.05-0.149g/100ml (reference)						
≥ 0.15g/100ml	1.21	1.03-1.42	0.02	1.14	0.97-1.34	0.11
Sentencing Severity						
Convicted, not further punished (reference)						
Other	0.60	0.13-2.61	0.49	1.21	0.25-5.88	0.80
Monetary Penalty	0.89	0.44-1.79	0.74	1.22	0.28-5.87	0.78
Community Based Order	0.85	0.61-1.21	0.38	1.33	0.31-5.80	0.70
Suspended Sentence	0.99	0.65-1.51	0.97	1.50	0.33-6.80	0.59
Imprisonment	1.18	0.67-2.05	0.56	1.29	0.29-5.67	0.73

A logistic regression with drink driving repeat offending as the outcome was conducted, with location, age at the time of the first offence and BAC entered as risk factors. Sentencing severity was also included in the model in order to examine any association with recidivism. Crude and adjusted relative risks for repeat offending are presented in Table 2. As can be seen, a strongly statistically significant association was found between remoteness of the location of the court and the odds of recidivism, with association increasing with each increment in remoteness. Offenders who committed their first offence between 15-24 years of age were also significantly more likely to go onto be repeat offenders compared to drivers over 40+ years of age. High range BAC at first offence was not significantly associated with repeat offending, when adjusted for other risk factors. Gender was not associated with repeat offending. Of the six different categories of sentencing severity, none were significant in the model.

Analyses were conducted to identify secondary effects between significant variables. No significant secondary associations could be identified in the models, so interaction effects in the modelling are likely to be minimal. The Hosmer and Lemeshow test ($p = 0.64$), indicated that the model fits the data well.

3.2 Repeat offenders -time between first and second conviction

Of the 706 repeat offenders, almost half re-offended within the first 12 months from the date of the first conviction (n=336; 47.5%). The proportion of offenders apprehended and convicted of drink driving on a further occasion declined over time. Between 13-24 months, 149 (21.1%) went on to re-offend. From 25 to 36 months after the first conviction 120 (16.9%) of the repeat offenders relapsed. The remaining recidivist drink drivers in this study (n=101; 14.3%) re-offended more than 36 months after their first conviction.

4. Discussion

This is the first study investigating the characteristics of recidivist drink drivers among Indigenous peoples specifically on a state-wide level. As mentioned previously, the authors acknowledge that the methodology used in this study has limitations in relation to the certainty that the individuals categorised as first time convicted offenders have in fact been categorised correctly. This is highlighted by the nine percent recidivism rate in this sample, which would seem to be an under estimation compared to the rates of recidivism normally reported for mainstream drink driving populations [19]. However, the authors believe it is important to conduct the analysis of the data at this time because of the critical impact this particular issue has on Indigenous drivers and the communities in which they live, and the subsequent importance of informing the development of interventions to reduce this type of offending. Such data limitations as well as the inconsistency in recording Indigenous status accurately have previously been acknowledged as problems facing researchers in being able to make meaningful conclusions from research attempting to investigate issues affecting Indigenous peoples [29].

Other limitations pertaining to the data include the lack of information on the location of the offence. It may be that the location of the sentencing court as a proxy may not be an accurate reflection of where these drink drivers live. Nevertheless, it is unlikely that a large number of offenders applied to have their drink driving matters moved from the locations where the offences occurred to another court location. Unfortunately, the specific BAC reading at time

of offence was also not available within the dataset. Thus, further analysis of the convictions pertaining to BAC could not be completed other than the three BAC charges under legislation. Recording specific offence details would improve the analysis of the data and therefore the understanding of the risk factors of Indigenous repeat offenders, especially as analysis is already limited to certain datasets because of non-recording of Indigenous status in other databases.

A final limitation lies in the type of data. As this study is based on conviction rates, these may not be an accurate reflection of the repeat drink driving behaviour among Indigenous peoples in Queensland, as there are several factors that impact on such rates. Important factors such as the court clearance rates and level of policing could not be taken into account here. Moreover, enforcement levels, particularly in remote areas, where there are fewer resources to enforce drink driving laws, may vary widely, and thus detection and conviction may also vary. However, the patterns and relationships are by no means clear, as it is also possible that in more isolated areas and remote communities, where people are known to each other, enforcement can target known drink drivers or utilise local knowledge in enforcement activities. It is not possible here to say which, if either, of these situations is the most likely or what the size of any effect has been.

4.1 Relevance of the Findings

Unlike studies from the wider population, such as Beirness et al. (1997), that report that a greater proportion of repeat versus other drink drivers record high range BACs [30], often considered to be because of chronic alcohol misuse, the same pattern is not reflected for this Indigenous offender drink driving sample. For this sample, the proportion of first time Indigenous drink drivers convicted of high range BAC offenses was higher than for mainstream first offender cohorts. For example, in the Drink Driving Discussion Paper, commission by the Queensland Government, 19.6 percent of first offenders in the wider Queensland population were recorded as having a high range BAC [19] while for the current sample 37.3 percent of the first time offenders had this level. One interpretation of this result is that the pattern of alcohol consumption for Indigenous versus non-Indigenous drivers is different, with a large proportion of Indigenous drivers who do not have a prior drink driving conviction apparently being apprehended after consuming a large quantity of alcohol prior to driving. Based on the findings related to BAC from this study, it may also be argued there may be no difference between the recidivist drink driver and first offender patterns of alcohol consumption for Indigenous drivers. This may seem counterintuitive given that consistently high rates of alcohol misuse amongst Indigenous peoples in Australia have been documented for a number of decades [1]. However, it suggests that misuse may occur early for some Indigenous youth. This interpretation is consistent with the research highlighted earlier that suggests that risky alcohol consumption patterns are more common among Indigenous drinkers than non-Indigenous, even though the proportions of Indigenous peoples who consume alcohol is lower than for non-Indigenous people [10,11,31]. What the current research adds is that such risky drinking may begin early for Indigenous drinkers. More speculatively, early onset risky drinking may be exacerbated by the consequences of drink driving offences, such as losing one's license and therefore being unable to gain employment and thus having greater unoccupied time.

Remoteness of the sentencing court location was found to be a strong predictor of repeat drink driving. This result extends previous findings on Indigenous road-related offending

such as over representation in alcohol-involved crashes in rural areas and unlicensed driving in non-metropolitan areas [32]. Historically, such driving-related offences in more isolated locations have been attributed to the lack of services, limited alternative transport options [32,33] and differences in attitudes towards road safety amongst rural populations. Although speculative, there may also be a perception among drink drivers in more isolated areas that the likelihood of apprehension and therefore punishment is low because of limited resources to police this behaviour, thereby fostering a culture of dangerous road behaviour such as drink driving.

An additional factor that may be affecting drink driving patterns in remote Indigenous communities is the legislated control of the sale and possession of alcohol through alcohol management plans. Early evaluations of alcohol restrictions in some Queensland Indigenous communities have reported that these may have reduced assault-related injuries [34,35]. However, such positive effects of alcohol management may be being undermined by 'sly grogging', where local Indigenous residents from communities where restrictions are present drive to other locations where restrictions do not apply to purchase and consume alcohol [36,37]. This presents opportunities for drink driving and therefore detection and prosecution. It is unclear to what extent this phenomenon affects recidivism amongst Indigenous drink drivers and unfortunately the scope of this study does not allow for any closer examination of such effects. However, it appears that much more research into this issue in remote Queensland Indigenous communities is necessary.

Lastly, for repeat offenders, the findings reported here suggest that the first 12 months after conviction is a high risk period for recidivism. In turn this suggests that offering services shortly after conviction for a drink driving offence may be critical in reducing re-offending.

The findings in this study are preliminary; nevertheless, we have shown that issues such as risky alcohol consumption and limited transportation alternatives that affect drink driving generally are especially important for Indigenous repeat drink driving in regional and remote areas. As an increase in the population of young Indigenous peoples is expected over the next decade [38], it is likely that there will be an increase in the number of Indigenous youth applying for drivers' licenses or having access to motor vehicles. Research indicates a larger proportion of Indigenous adolescence between 14-17 and 18-24 years of age self-report riskier alcohol use than their non-Indigenous counterparts [39]. Therefore, advancements towards the understanding of drink driving relapse should also be made to allow for the development of effective countermeasures targeting the specific age and regional issues this study has identified.

Development of offender-based therapeutic, treatment programs with long-term support is one option to address these issues. Whilst steps have been made towards developing 'best practice' Indigenous road safety programs [40], further work is required in the area of drink driving. Work is needed on development and testing of multifaceted models focusing on the interaction of legal, social and psychological factors that describe and explain relapse among this cohort, since there is limited literature to inform the development of such a program. Consistent with other researchers, we would urge the inclusion of variables such as predictors of future intentions to drink drive, alcohol consumption levels, and self-reported recent drink driving behaviours [41]. Additionally, illicit drug use and driving should also be included given the recently reported high rates of cannabis in remote Indigenous communities [42]. Given the high level of contact Indigenous peoples have with the justice system, the potential for a treatment program to be delivered as part of a diversionary program for Indigenous drink drivers, with the additional possibility of licence disqualification reductions if

completed successfully, also requires serious consideration if this issue is to be addressed. Finally, the fact there is larger number of Indigenous peoples who abstain from alcohol use should also be considered as a strength, particularly in more rural and remote areas and a possible opportunity to build capacity for drink driving strategies.

Conclusion

This study is the first of its kind in Australia, as it provides information on a state-wide level about the demographics and risk factors associated with Indigenous recidivist drink driving. In contrast to findings on mainstream drink drivers, recidivist Indigenous offenders appear to be considerably younger, and more likely to be living in rural and remote areas. Patterns of alcohol consumption for Indigenous first time drink drivers appear to be different from those of offenders from the wider population: Indigenous first time offenders are likely to be charged with relatively high levels BAC offences, similar to those of their recidivist counterparts. Future direction should move to developing comprehensive models focusing on identifying the various legal, psychological and social factors attributable to recidivist drink driving to inform the development of effective countermeasures. Reducing the injuries and fatalities contributed by recidivist drink driving is needed to address the broader alcohol-related health burden experienced by Indigenous Australians.

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