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Predictors of Re-offence among Australian Drink Drivers

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Abstract

As part of the evaluation of a drink driver rehabilitation program in a non-metropolitan area of Queensland we collected retrospective and prospective information on close to 900 drink drivers who undertook the program and over 800 contemporaneous drink driving offenders from the same area who did not. The data collected included details of the index drink driving offence, traffic and criminal histories for 5 years prior to the index court hearing and subsequent criminal and drink driving offences. Over 200 drink driving re-offences were committed by the cohort during the follow-up period, which averaged 34 months, with a range of 15 to 57 months. Using a failure-time model of time to re-offence, including proportional hazards modelling, independent predictors of re-offence among program participants and were identified. These include previous drink driving, unlicensed or dangerous driving, and a history of criminal convictions of any type.

Keywords: Drink driving, re-offence rates, cohort study, survival analysis, risk factors, traffic offence.

Introduction

This paper discusses predictors of drink driving recidivism from routine law enforcement data and will not deal with psycho-social or contextual risk factors. For the purposes of devising intervention programs or mass campaigns a knowledge of such predictors is essential. However, there is value in being able to predict future rates of repeat offence from a knowledge of such data as are available in court, police and traffic records. For instance, when planning a rehabilitative intervention it is useful from the standpoint of statistical power to know which group of drivers is likely to yield the most future events. Furthermore, in considering how one might evaluate an intervention or a media campaign one needs to be able assess the cost-effectiveness of collecting certain data items - to decide which are essential to obtain and which can be dispensed with. In certain contexts these risk factors could be used to justify the imposition of additional restrictions, such as alcohol ignition interlocks, on drivers who merit it on the basis of their offence histories.

A number of papers on the subject have appeared in the literature in recent years. Marowitz (1998) has reviewed several which deal with the issue of blood alcohol concentration (BAC) at the index or prior offences as predictors of recidivism. Many of these found some relationship between current and past BAC and the outcome of interest. Marowitz himself postulates a cubic form of relationship between index BAC and subsequent drink driving offence rates, with rates highest at 0% and 0.29% BAC and lowest at about 0.09% BAC. This is in an area where mind-altering drugs other than alcohol are in common use and

enforcement is largely on the basis of police suspicion. In Australia on the other hand, random breath testing (i.e. without the need to observe suspicious driving behaviour) is responsible for a high proportion of drink driving arrests. Moreover there is at present no mechanism for the routine testing for the presence of drugs other than alcohol in the blood, and estimates of the prevalence of driving under their influence are largely speculative.

Other studies have found that factors such as young age, previous drink driving convictions, histories of other traffic offences or crashes and non-traffic criminal behaviour also predict drink driving recidivism (DeYoung 1997, Peck 1994). Most of these studies were carried out in North America or Europe. There are few if any recently published investigations on this topic in Australia, although Sheehan in a conference paper reported little or no association between BAC and subsequent re-offence in first offenders (Sheehan 1993). We report here the results of a study based on a cohort of persons who appeared in court on drink driving charges between 1993 and 1995 which was assembled for the purposes of evaluating a drink driving rehabilitation program in Central Queensland, Australia.

Materials and Methods

The "Under the Limit" drink driving rehabilitation program was implemented on a trial basis in the Central Region of Queensland during the period 1st January 1993 until 31st December 1995. It was part of a wider community intervention in which the Central Queensland Region was the experimental or intervention region. . More detailed information on the development and implementation of the program is described by Sheehan et al (1995).

The outcome evaluation of the Under the Limit program examined the effectiveness of the program in reducing re-offence rates of the offenders recruited to the program. Specifically, the study was designed to enable comparisons to be drawn with a control group in terms of their subsequent drink driving offences while controlling for traffic and criminal histories prior to the index offence. The control group comprised persons who appeared before the intervention courts during the same period of time but elected not to complete the course. Results of this evaluation were presented at a conference in May 1999 (Siskind et al 1999).

The traffic and criminal records of both those offenders who completed the program and the non participating offenders who declined to complete the program were followed up. To select a control group of offenders, an equivalent list of all drink driving offenders was obtained from participating courts. For each convicted drink driver who elected to undertake the program, we selected as a control the offender in court on the same or a nearby date who was closest in age and of the same sex. Criminal histories were accessed through the Queensland Police Service, while traffic histories came from Queensland Transport records.

Statistical methods

Since the main objective of the evaluation was to compare an intervention cohort with controls, the most appropriate starting point for follow-up was the trial date for both groups, rather than the date of the index offence or the date at which the offender commenced the program. Only drink driving offences which took place after the commencement date were considered as re-offences. Relatively few subjects had more than one such re-offence (14% of re-offenders); survival analysis was therefore the analytic method of choice, with log-rank tests for univariate analysis and proportional hazards modelling when several factors were considered jointly.

We considered subjects' traffic and criminal histories in the five years prior to the date of the index offence and characteristics of their index offence as possible predictors of recidivism. These covariates were: number of drink driving, dangerous driving and other traffic offences; number of drug offences and offences against the person, against property and against public order, as defined by the Queensland Police Service; a jail term in the previous five years; being unlicensed at the index offence or, separately, at any time in the previous five years; and blood alcohol concentrations (BACs) at the index offence and at prior drink driving offences. After univariate analysis prior offences of all types were all reduced to dichotomous variables. From the criminal offence history, a composite variable, number of different types of criminal offence committed, was constructed with values, zero, one, two, more than two. Blood alcohol concentrations at previous offences were dichotomised into low (less than 0.15 g/100ml) and high (at least 0.15 g/100ml, failure to provide a specimen or a police judgment that a driver was "under the influence of alcohol"). Blood alcohol concentration at the index offence was treated in various ways, among them categorisation into bands 0.05% wide and as a continuous variable with only a linear term, with in addition a quadratic and a cubic term. For the purposes of this analysis "failure to provide a breath or blood specimen" and "under the influence of alcohol" were taken to represent a BAC of 0.15%, which is the arbitrary level assigned by courts. Persons with unrecorded BACs (2.1%) were excluded from analyses involving blood alcohol readings. It has also been suggested that delays in bringing drink driving offenders to court also contributes to recidivism, and this factor has been considered too.

Other factors in the models were sex, age in three broad categories (< 25 years, 25 - 39 years and 40+ years) and the logarithm of length of licence disqualification (plus 1.0 to allow for zero lengths). Age was also treated as a modifying factor in later analyses. Experimental subjects and controls were initially analysed separately, but the results for each factor were sufficiently similar to allow the two groups to be combined, with experimental status added as a covariate.

Results

After preliminary exclusions, due mainly to missing data in both groups and ineligibility of controls, the control group comprised 807 convicted drink drivers and the experimental, 889. The average time from hearing date to end of observation was about 34 months in both groups, the longest being almost 5 years. During follow-up, 231 drink driving offences were recorded, 102 (12.6%) in the control group, and 129 (14.5%) among the offenders who elected to enter the program. The highest re-offence rate occurred among a subgroup (132, 14.8%) of participants who commenced but failed to complete the program. Five controls and one course participant had unrecorded lengths of licence suspension.

Characteristics of the subjects.

Table 1 lists the characteristics of the two groups of subjects in terms of their demography, offence records and penalties for the index offence. The main differences between the experimental group and controls were that the former had appreciably more prior convictions for drink driving and property offences and offences against the person, and higher median BAC at the index offence. A slightly higher proportion of persons entering the program had been previously sentenced to jail, but for shorter periods. Fewer controls than experimental subjects were penalised by licence suspension or disqualification.

Table 1. Demographic characteristics and offence records of drink driving offenders in the control and experimental groups.

Variable	Controls		Experimentals	
	n	%	n	%
Sample size	807		889	
Female	94	11.6	100	11.2
Mean age at offence & s.d.	31.3	11.0	30.9	10.0
Offences in last 5 years				
Drink driving				
1	156	19.3	254	28.6
2 or more	29	3.6	73	8.2
Dangerous driving	5	0.6	8	0.9
Unlicensed driving	54	6.7	54	6.0
Other traffic violations				
None	419	51.9	444	49.9
1	158	19.6	205	23.1
2	81	10.0	108	12.1
3 or more	149	18.5	132	14.8
Criminal (any)				
Against person	43	5.3	103	11.6
Property offences	72	8.9	169	19.0
Public order	185	22.9	167	18.8
Drug offences	86	10.7	121	13.6
Any criminal record	242	30.0	303	34.1
Jail	30	3.7	49	5.5
Median sentence (if any)	6 months		4 months	
At index offence				
Dangerous driving	6	0.7	7	0.8
Unlicensed	128	15.9	172	19.3
Median BAC (gms/100ml)	0.12		0.16	
Suspended	681	84.4	834	93.8
Jail	2	0.2	9	1.0

Predictors of re-offence

The following factors were predictive of drink driving recidivism on a univariate basis, as established by log-rank tests aggregated across the control and experimental groups:

Prior drink driving, that is at least one such offence in the previous five years; unlicensed driving in the previous five years; unlicensed driving at the index offence; dangerous driving in the previous five years or at the index offence; one or more other traffic violations in the previous five years; at least one criminal conviction in the previous five years for an offence against persons; a property offence; an offence against public order or a drug offence; or a jail sentence in the previous five years.

Sex, age, BAC at index offence or at any prior offence and length of delay in bringing the index offence to court did not significantly predict re-offence in these data. Length of licence suspension awarded at the index hearing was marginally predictive only in the control group.

Distinguishing between one prior offence (of whatever type) and more than one offence, or between one, two and more than two, and so on, made little difference to predictive power. A partial exception to this was a composite variable, number of classes of prior criminal (non-driving) convictions; in this instance a gradient of increasing propensity for drink driving re-offence with increasing number of classes was observed. This variable, together with the variables, prior drink driving offence, dangerous driving, prior or current unlicensed driving, history of other traffic violations and prior jail sentence, as defined above, were included in a proportional hazard model. Two further variates, program participation and the logarithm of length of licence suspension (plus 1.0 to deal with zero lengths) were also included. Prior unlicensed driving, history of other traffic violations and of a prior jail sentence were no longer predictive in this model and were excluded from further consideration. The remaining factors with their hazard ratios and 95% confidence intervals are presented in Table 2.

Table 2. Hazard ratios and 95% confidence intervals (CI) for independently factors predicting drink driving recidivism.

Factor	Hazard ratio	95% CI
Prior drink driving conviction(s)	1.37	1.02 – 1.83
Number of types of criminal offences:		
One	1.37	0.97 – 1.93
Two	1.80	1.20 – 2.7
Three	2.1	1.37 – 3.2
Dangerous driving conviction (prior or concurrent)	2.9	1.45 – 5.6
Unlicensed driving at index offence	1.60	1.18 – 2.2

When the analysis was conducted within the three age categories described above, two results of interest emerged. Firstly there was a suggestion that in drivers under 25 a cubic relationship of BAC at the index offence to recidivism risk might hold, as suggested by Marowitz (1998). However in this case the curve is inverted, with a peak at about 0.07% and a trough at about 0.18%; moreover, the significance level as judged by the change in deviance is barely 10%. On the other hand, a significant interaction of age and dangerous driving was found, with the hazard ratio for the latter being less than 1.0 in the under 25 year group rising to over 3.0 in the 40 years plus category.

Discussion

Our results are consistent with some but not all previous work. In particular we do not find any clear association between blood alcohol level at the index offence and risk of further drink driving offences, except perhaps in younger drivers. Patterns of drinking among young Australians differ from those of their older compatriots (Australian Institute of Health and Welfare 1999) which could partly account for such a finding.

Like most others we show a relationship between past drink driving or unlicensed driving and propensity to re-offend. We find an even stronger relationship between dangerous driving convictions, which may be equated to “aggressive unlawful driving” (Peck 1994), and drink driving recidivism. Contrary to intuition, the relationship in our data is weakest among young drivers and strongest in middle-aged and older drivers. Similarly there is a strong relationship between past criminal behaviour, however classified, and risk of drink driving recidivism, with the risk ratio increasing with the number of types of crime committed rather than with the number of crimes. This may be to some extent a consequence of the way the data on criminal offences were coded, where a single criminal incident may have led to several charges in the same class, whereas offences in different classes could perhaps more often have represented separate incidents. We plan to clarify this and other issues relating to the relationship of non-traffic offence history to driving behaviour.

Despite investing a strong effort in obtaining accurate information on the prior and subsequent histories of all the individuals in the experimental group and those selected as controls, we are aware that many imperfections remain. However we do not believe that they will be so numerous as to compromise or bias the results of this analysis.

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