

## ORIGINAL ARTICLE

## Personal and situational influences on drink driving and sober driving among a cohort of young adults

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**Objectives:** To compare personal and situational influences on incidents involving drink driving with those involving sober driving.

**Methods:** Information on a range of road safety practices was sought in face to face interviews conducted with 969 members of the Dunedin Multidisciplinary Health and Development Study cohort at age 26 years. A total of 750 study members reported an incident that involved the opportunity to consume alcohol and also travel by motor vehicle. Of these, 87 were classified as "drink drive incidents" and 663 as "sober drive incidents".

**Results:** Study members who were male, of lower socioeconomic status, had no school qualifications, or were dependent on alcohol or marijuana at age 21 were significantly more likely to report a drink drive incident at age 26. Compared with the sober drive incidents, the drink drive incidents were more commonly associated with driving alone, drinking at bars, and no advanced planning. For drink drive incidents the amount of alcohol consumed was influenced by the conviviality of the occasion, whereas for sober drive incidents it was the need to drive. One quarter of those reporting drink drive incidents stated they had used marijuana and/or LSD at the event at which they drank.

**Conclusions:** Drink drive and sober drive incidents differed, particularly with regard to decisions made before the event. Prevention efforts could usefully be targeted toward these decisions.

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Alcohol impaired driving is an important road safety problem throughout the industrialised world.<sup>1-6</sup> Much of the research in this area has focused on crashes or police conviction records. A more recent approach has been to investigate situational factors associated with incidents of drinking and driving.<sup>7</sup> One factor that has been the subject of such research is the location where the drinking that preceded the drink drive incident occurred, with licensed premises consistently identified as the most common location among adults,<sup>8-11</sup> but among adolescents it was drinking outdoors or in vehicles.<sup>12-14</sup>

Not all occasions that involve drinking result in unsafe driving incidents, and from a prevention perspective, it would be useful to know how events that result in drink driving may differ from those where sober driving occurs. Approaches previously used to investigate this have considered different events reported by the same persons,<sup>15</sup> responses to hypothetical situations,<sup>16</sup> or general behaviour.<sup>17</sup> Factors such as availability of alternative transport and the presence of others who disapprove of drink driving, have been identified as important factors that determined whether drink driving occurred. Also, bar patrons who arrived alone were more likely to drink drive upon leaving.<sup>18</sup>

These studies, however, were limited in that they could not examine the relationship between the personal characteristics of those involved and the situational factors associated with an actual event. The present study sought to explore this relationship, by examining specific drink or sober drive incidents among a birth cohort of young adults, at age 26 years. Earlier data had been obtained from this cohort on alcohol dependence, which is known to be associated with drink driving<sup>19, 20</sup> and traffic crashes.<sup>21</sup>

The aims of this study were (a) to compare the personal characteristics of those who drink and drive, or travel with a drink driver, with those who did not and (b) to examine differences in the situational factors surrounding drink drive and sober drive occasions, and from this identify strategies that had been used to successfully to avoid drink drive incident.

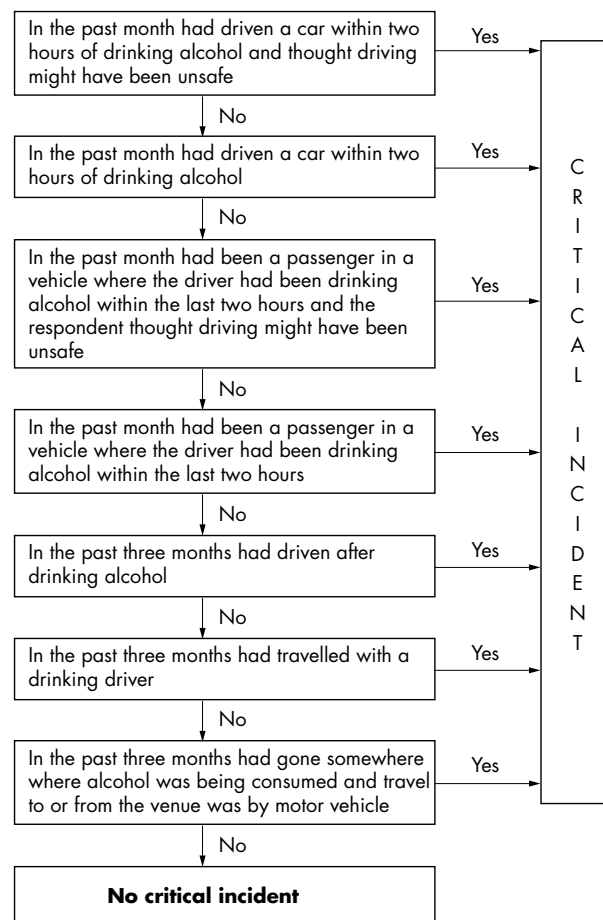


Figure 1 Procedure for selection of critical incident.

**Table 1** Demographic characteristics and marijuana and alcohol dependence for those involved in sober drive and drink drive incidents

	No (%) sober drive	No (%) drink drive	$\chi^2$	p Value
Gender				
Female	338 (51)	17 (20)	30.5	0.001
Male	325 (49)	70 (80)		
Car ownership				
No	148 (22)	19 (22)	<0.1	0.919
Yes	515 (78)	68 (78)		
Number of children				
None	516 (78)	70 (80)	0.3	0.577
One or more	147 (22)	17 (20)		
Marital status				
Unmarried	534 (81)	78 (90)	4.3	0.039
Married	129 (19)	9 (10)		
Socioeconomic status				
1–2 (highest)	130 (20)	12 (14)	10.9	0.004
3–4	341 (51)	37 (43)		
5–6 (lowest)	160 (24)	35 (40)		
Employment				
Employed	611 (92)	81 (93)	0.1	0.756
Unemployed	52 (8)	6 (7)		
School qualifications				
None	85 (13)	21 (24)	8.1	0.004
One or more	578 (87)	66 (76)		
Alcohol dependent at age 21				
No	590 (91)	69 (81)	8.7	0.003
Yes	56 (9)	16 (19)		
Marijuana dependent at age 21				
No	596 (93)	65 (80)	14.0	0.001
Yes	47 (7)	16 (20)		

\*df=degrees of freedom and equals 1 unless given otherwise.  
NB: column totals differ due to missing data.

## METHOD

The study was based on the Dunedin Multidisciplinary Health and Development Study (DMHDS) which is a longitudinal study of the health, development, attitudes, and behaviour of a cohort (n=1037) born at the only obstetric hospital in Dunedin, New Zealand between 1 April 1972 and 31 March 1973. Members of this cohort have been followed up at two yearly intervals from age 3 to 15 years, and at ages 18, 21, and 26 years. Further details about the cohort and the DMHDS have been published elsewhere.<sup>22</sup>

The present study was part of a follow up conducted when the study members were aged 26 years. In a personal semistructured interview study members were asked about one particular event (that is the “critical incident”) that must have occurred at a venue where alcohol was available and there was also the opportunity to travel by motor vehicle. A pilot study had been conducted to develop the procedure to be followed in this interview.<sup>23</sup> The criteria for selecting the “critical incident” are given in fig 1. To assist with recall and limit selection bias the most *recent* and not necessarily the most *risky* occasion was deemed to be the critical incident. Information about the critical incident was recorded verbatim during the interview, and coded later.

Following guidelines provided by the Alcohol Advisory Council ([www.alcohol.org.nz](http://www.alcohol.org.nz)) the incidents were categorised as drink drive or sober drive. Where the study member was the driver, it was classified a sober drive incident if they had four or less standard drinks in the first hour and no more than one standard drink for each subsequent hour, up to a maximum of eight standard drinks (one New Zealand standard drink equals 10 g of alcohol) otherwise it was a drink drive incident. Where the study member was a passenger, it was classified a sober drive incident if the driver had four or less drinks, undetermined if driver had 5–8 standard drinks, otherwise it was a drink drive incident. Cases were excluded where the sobriety of the driver was undetermined, or if the incident did not take place in New Zealand.

The background and demographic measures were obtained in other interviews at the age 26 assessment of the DMHDS. Socioeconomic status was measured using the Elley-Irving scale, which is calculated using occupation and education.<sup>24</sup> Measures of alcohol and marijuana dependence were obtained at age 21 years using a modified version of the Diagnostic Interview Schedule.<sup>25–27</sup>

$\chi^2$  Statistical tests were used to examine differences in background characteristics of those involved in sober drive and drink drive incidents.<sup>28</sup> For the critical incidents, some quotations from the interview are included to provide additional contextual information.

## RESULTS

Of the original 1037 members of the DMHDS cohort 969 (93%) completed the road safety interview at age 26 years. Of these, 750 reported a “critical incident”, 663 (88%) a sober drive incident, and 87 (12%) a drink drive incident. The remaining 219 had no critical incident. Of the exclusions, 18 were known to have died, 11 were excluded for various reasons (for example three were severely handicapped), and 39 (4% of the original cohort) were refusals or missing.

A comparison of the personal characteristics of those who reported a drink drive or sober drive incident are shown in table 1. Being male, unmarried, of low socioeconomic status, no school qualifications, and alcohol or marijuana dependence at age 21, were all significantly associated with being involved in a drink drive incident.

Table 2 shows that compared with sober drive incidents, drink drive incidents were more likely to have been associated with drinking at a bar (51% v 36%), and after-work drinks (24% v 12%), in a provincial town (66% v 81%), and on a Friday night (43% v 25%).

Events resulting in drink drive incidents were less often planned in advance, more likely to have been driven to alone, and more likely to involve drinking before going to the event (see table 3).

**Table 2** Background details of events attended for those involved in sober drive and drink drive incidents

	No (%) sober drive	No (%) drink drive
Event location		
Bar	241 (36)	44 (51)
House/own home	233 (35)	28 (32)
Restaurant	77 (12)	1 (1)
Work place	50 (8)	9 (10)
Other	60 (18)	5 (5)
Total	661 (100)	87 (100)
Type of occasion		
No special occasion	265 (40)	33 (38)
Family/life event	201 (30)	18 (21)
After-work drinks	77 (12)	21 (24)
Sports event	59 (9)	8 (9)
Other	59 (9)	7 (7)
Total	661 (100)	87 (100)
Geographic location of event		
City	535 (81)	57 (66)
Large provincial town	53 (8)	12 (14)
Small provincial town/country	75 (11)	18 (21)
Total	663 (100)	87 (100)
Day of week		
Monday to Thursday	194 (29)	22 (25)
Friday	167 (25)	37 (43)
Saturday	239 (36)	19 (22)
Sunday	53 (8)	7 (8)
Unsure	10 (2)	2 (2)
Total	663 (100)	87 (100)

NB: column totals differ by variable due to missing data.

**Table 3** Pre-event activity including planning, travel, and drinking for those involved in sober drive and drink drive incidents

	No (%) sober drive	No (%) drink drive
Planning ahead for the event		
Few hours or less ahead	273 (42)	52 (59)
Day or more ahead	112 (17)	8 (9)
Week or more ahead	192 (29)	11 (13)
A regular event	85 (13)	15 (17)
Other	0	1 (1)
Total	662 (100)	87 (100)
Travel to event		
Drove self/alone	180 (27)	38 (44)
Drove self with others	188 (28)	17 (20)
As a passenger	166 (25)	14 (16)
Other	128 (21)	18 (20)
Total	662 (100)	87 (100)
Standard drinks consumed before going to the event		
0	565 (86)	62 (71)
1-6	48 (7)	8 (9)
>6	46 (7)	17 (20)
Total	659 (100)	87 (100)

Some characteristics of the event are shown in table 4 with the commonest influence on drinking behaviour for those reporting drink drive incidents being the conviviality or atmosphere at the event (36%). For sober drive incidents it was the need to drive (28%), as in the quote "I wanted to drink but public transport is no good so I had to curtail my drinking so I could drive". In 24% of the drink drive incidents, marijuana and/or LSD had also been used.

Some had predetermined the amount they would drink "I was driving, I had to go before I drank too much", but for some such an intention was sometimes affected by unexpected factors: "different people who turned up, I had to stay and talk to them".

**Table 4** Characteristics and behaviour at the event for those involved in sober drive and drink drive incidents

	No (%) sober drive	No (%) drink drive
Standard drinks consumed at event		
0	110 (17)	3 (3)
1-4	402 (61)	3 (3)
5-8	78 (12)	28 (32)
9-12	27 (4)	25 (29)
>12	45 (7)	28 (32)
Total	662 (100)	87 (100)
Atmosphere at the event		
Pleasant	582 (88)	72 (83)
Unpleasant/noisy/drunken	70 (11)	15 (17)
Other	9 (1)	0
Total	661 (100)	87 (100)
Factors influencing the amount of alcohol consumed		
Need to drive	180 (28)	7 (8)
Conviviality of event	96 (15)	31 (36)
Not drinking at present	108 (17)	6 (7)
Money	56 (9)	9 (10)
Other	214 (33)	34 (39)
Total	654 (100)	87 (100)
Other drugs used at event		
No other drugs	613 (93)	66 (76)
Marijuana and/or LSD	48 (7)	21 (24)
Total	661 (100)	87 (100)
Length of time at event		
Two hours or less	301 (45)	24 (28)
Over two hours	359 (54)	63 (72)
Total	660 (100)	87 (100)

Table 5 shows that passengers were often of a similar state of sobriety to the driver, and that those involved in drink drive incidents often went on to another drinking location (43% v 19%). Drinking drivers were more likely to be travelling alone than sober drivers (47% v 30%).

Alternative transport was available for around three quarters of the incidents (table 5) but one of the most common reasons for drink drivers not using it was not wanting to leave their car: "I wanted to go home and didn't want to leave the car", "I had my own car and it would be a hassle to get the next day", "It was too expensive and a hassle if I'd left the car".

Of those in drink drive incidents, 54% acknowledged that it was risky (table 5) with reasons usually related to being caught by the police. Also, of the drink drivers who had planned ahead but changed their plans, the decision to drive, or be driven, appeared to be impulsive and reflected impaired judgment: "I thought I had a place to stay and they were deciding on who was sleeping where and I thought I'm not mucking around wasting time so I just left", "I only ran into him at the end of the night so I wasn't quite sure how much he'd been drinking and I was a bit drunk too".

Only two drink drivers (3%) reported that other people put pressure on them to drive. Also, for drink driving incidents where further driving took place, approximately 20% were return trips, and often the reason for the trip was to go out and purchase more alcohol.

Further analyses were conducted to examine in more detail some areas of interest, such as the relationship between driving to and driving from the event. Over half (n=423) of the study members had driven themselves to the event, 92% (n=391) of whom also drove themselves from the event. Of these, 336 were sober drivers and 55 were drink drivers. Of the sober drivers, 86% had specifically planned to remain sober, for the drink drivers the comparable figure was 55% (n=23). Of these 23 drink drivers, 11 drank more than they had intended and acknowledged that driving had been risky, while nine drank the amount they had intended to drink but did not consider that it was risky for them to drive.

**Table 5** Travel after the event and associated factors for those involved in sober drive and drink drive incidents

	No (%) sober drive	No (%) drink drive
Description of passengers' sobriety*		
All/mostly drunk	54 (22)	20 (62)
Not too drunk	44 (18)	6 (19)
Mostly/all sober	149 (60)	6 (19)
Total	247 (100)	32 (100)
Further drinking after leaving event		
No further drinks	536 (81)	50 (57)
Further drinks	124 (19)	37 (43)
Total	660 (100)	87 (100)
Owner of vehicle used for travel from the event		
Self/partner	406 (61)	64 (74)
Friend/family	131 (20)	18 (21)
Public transport (for example, taxi, bus)	60 (9)	0
Other	66 (10)	5 (6)
Total	663 (100)	87 (100)
Travelling companions from event		
By self	199 (30)	40 (47)
Friends/flatmates only	156 (24)	25 (29)
Partner, girl/boyfriend	140 (21)	13 (15)
Other	162 (25)	8 (9)
Total	657 (100)	86 (100)
Availability of alternative transport from event		
No alternatives available	171 (26)	21 (24)
Alternatives available	488 (74)	66 (76)
Total	659 (100)	87 (100)
Perceived risk of post-event travel		
No risk	627 (95)	38 (44)
Risky	31 (5)	47 (54)
Not sure	5 (1)	2 (2)
Total	663 (100)	87 (100)

NB: column totals differ by variable due to missing data.

\*Reported only by those study members who drove from the event with passengers.

The type of occasion (table 2) was also examined to compare "after-works drinks" drink drive incidents (n=21) with drink drive incidents after other events (n=66), and the quantity of alcohol consumed by the driver. This showed that for "after-work drinks" only one incident involved a driver who had consumed over 12 standard drinks, whereas for the other incidents over half (n=36) had consumed that amount.

## DISCUSSION

While previous research has considered the personal and situational characteristics of drink drive incidents, this is the first time of which we are aware that these have been compared with sober drive incidents. In this study we were also able to examine personal characteristics, such as alcohol dependence, which is not often possible for a community sample. There are several other factors, however, that should be kept in mind when interpreting the results from this study. First, because of the hierarchical method we used to select the "critical incident" the participants were more likely to report incidents where they were a driver, rather than a passenger. This was because it was considered that the study member would be more likely to be know the details of an event (for example, how much the driver had to drink) if they were the driver, rather than if they were a passenger. Also, we wished to compare the background and personal characteristics of those involved in these events, and these data were only available for the members of the DMHDS cohort. The results reported here, therefore, cannot be construed as representative of the prevalence of these different scenarios among the cohort, or any wider population.

Another factor to be considered is the method used to classify the incident as drink drive or sober drive. We estimated

whether drivers were sober or drunk based on self report, and the accuracy of these estimates will have varied between individuals. There is evidence that self reported drinking collected in the manner used in this study is, if anything, under-reported as quantities increase.<sup>29</sup> Also, acknowledging the imprecise nature of these estimates we used a uniform definition of standard drink consumption for males and females. While this may have resulted in a few females failing to be classified as drink drivers, when perhaps they should have been, this is unlikely to have had much influence on the findings.

The first aim of this study was to identify personal and background characteristics that differed between those involved in drink drive compared with sober drive incidents. The most important finding was the highly significant association between alcohol and cannabis dependence at age 21 and being involved in a drink drive incident at age 26. Similar findings have been previously reported,<sup>19-21</sup> and it is an important point because those who are dependent on alcohol have extreme difficulty modifying their drinking behaviour. They can, however, make decisions about driving, and interventions specifically designed to encourage this group not to drive must be considered. Also, it may be possible to identify those who are hazardous drinkers or alcohol dependent by using a screening tool such as the AUDIT,<sup>30</sup> among drivers convicted of drink driving offences, and targeting them with an intervention specifically designed to take account of this condition.

Other personal factors associated with drink drive incidents were being a male, of lower socioeconomic status, having lower educational attainment, and being unmarried. The first three, in particular, have previously been demonstrated to be correlated with drink driving in New Zealand.<sup>4</sup>

The second aim of this study was to compare the situational factors associated with drink driving incidents with sober driving incidents. In doing this, we found it useful to consider the situational factors as pre-event, event, and post-event phases. It has been suggested that decisions made well before the decision to drive are very important in understanding drink driving decision making.<sup>7, 17</sup> These decisions include: which events to attend, where they are, who will drive, whom to go with, and what to do once there.<sup>7</sup> Nelson *et al*, in 1999, found that making plans in advance to avoid drink driving was highly correlated with actually avoiding drink driving.<sup>17</sup> The current study supports this, with the sober drive incidents being more likely to have been planned in advance than the drink drive incidents.

The location of where the drinking took place also differed. If drinking events took place in a bar, or in a provincial town, it was more common that it would result in a drink driving incident. These results are similar to those from previous research on drink drivers or alcohol related crashes,<sup>8-11, 31</sup> and suggest that enforcement around bars may help to deter this behaviour. Bars may also be a useful location to target for educational campaigns.

The type of event at which people drink and drive has received little previous attention. Overall, almost one quarter of the drink drive incidents were classified as after-work drinks, and further cautionary messages may be appropriate.

In concordance with other studies,<sup>17</sup> this study showed that, if persons travelled to an event alone, it was more likely to result in a drink drive incident, than if they had travelled with other people, particularly family members. Also, bar patrons with high blood alcohol concentrations who arrived alone were more likely to drive from the bar.<sup>18</sup> However, this may not apply to younger drink drivers who have been shown to be more likely to have passengers.<sup>12</sup>

Not surprisingly, those who drove to an event were highly likely to drive from the event, irrespective of how much alcohol they had drunk. This shows that people must be dissuaded from driving if they know they are going out drinking. This is arguably the single most important, and modifiable, aspect of

**Key points**

- Compared with sober drivers, the drinking drivers were significantly more likely to be alcohol dependent.
- Compared with sober drivers, the drinking drivers were significantly more likely to be male, have lower socioeconomic status, and no academic qualifications.
- Decisions made before going to an event helped to avoid a drink drive incident.
- Driving to an event was highly associated with friving from the event, irrespective of prior planning or amount of alcohol consumed.
- Drink drive incidents often followed drinking at bars or after-work drinks.
- Drinking drivers were more likely than sober drivers to be driving alone.

these events that could lead to a decrease in drink driving. This is illustrated by those who planned to stay sober because they wanted to drive, but after drinking more than they planned they still drove from the event, despite being aware it was risky. In rural areas, where driving is often a necessity and leaving the vehicle at home is not an option, other approaches may be needed such as encouraging bars to provide food, and promoting the drinking of low alcohol or non-alcohol drinks.

It has been shown that the difference between someone who is impaired (loss of ability but still legally able to drive) and someone who is intoxicated (legally unable to drive) is difficult to distinguish, particularly in large social groups.<sup>32</sup> In this study, we found that most of the passengers were in a similar state of sobriety (or drunkenness) to the driver. This meant that, for the drink drive incidents, the passengers were possibly not concerned about the driver's state of impairment, and would not have been able to exert a "sobering" influence.

**IMPLICATIONS FOR PREVENTION**

By comparing drink drive incidents with sober drive incidents, this study has identified differences between such occasions and the people reporting them. The young adults who were dependent on alcohol were significantly more likely to report drink driving incidents, and these people may be particularly important targets for interventions. There were obvious differences in the situational factors, particularly with regard to decisions made prior to the event itself. The most important intervention would be to encourage people not to drive to drinking events. If driving to the event is necessary, they should either have a plan for limiting drinking, or have prearranged alternative travel. Finally, if neither of the above occurs, or if the drinking plan fails (that is, too much has been consumed to drive safely), then other interventions such as host responsibility need to be employed.

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