

Screening for drugs in oral fluid: Illicit drug use and drug driving in a sample of metropolitan versus regional Queensland motorists

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Abstract

Police services in a number of Australian states and overseas jurisdictions have begun to implement or consider random road-side drug testing of drivers. This paper outlines research conducted to provide an estimate of the extent of drug driving in a sample of Queensland drivers in a metropolitan and regional area e.g. Brisbane and Townsville. Oral fluid samples were collected from 2381 motorists who volunteered to participate in the study after proceeding from a Random Breath Testing site (Brisbane = 1587 & Townsville = 794). Illicit substances were screened using the Cozart RapiScan oral fluid drug test device and included cannabis (delta 9 tetrahydrocannabinol [THC]), amphetamines, ecstasy, and cocaine. Drivers also completed a self-report questionnaire regarding their drug driving behaviour. Overall, 3.8% of the sample ($n = 92$) screened positive for at least one illicit substance, although multiple drugs were identified in a sample of 19 participants. The most common drugs detected in oral fluid were ecstasy ($n = 51$), cannabis ($n = 40$), followed by amphetamines ($n = 20$). A key finding was that cannabis was confirmed as the most common self-reported drug combined with driving and that individuals who tested positive to any drug through oral fluid analysis were also more likely to report the highest frequency of drug driving. Furthermore, a comparison between the two areas revealed drug driving detections rates were comparatively similar. This research provides evidence that drug driving is relatively prevalent on Queensland roads and may in fact be more common than drink driving.

Keywords

Drug driving, oral fluid, roadside drug screening

Introduction

At present, an increasingly amount of research effort has been focused on determining the prevalence and impact of drug driving on road safety. As a result, a substantial body of research is accruing that has focused on identifying the presence of illicit drugs in body fluids of those who have been involved in a crash (Del Rio, Gomez, Sancho, & Alvarez, 2002; Drummer, Gerostamoulos, Batziris, Chu, Caplehorn, Robertson, et al., 2003). For example, research has revealed that the presence of illicit drugs was identified in anywhere between 8.8% and 39.6% of such drivers (Del Rio, et al. 2002; Drummer, et al., 2003; Gjerde, Beylich, & Morland, 1993; Mura, Chatelain, Dumestre, Gaulier, Ghysel, Lacroix, et al., 2006; Seymour & Oliver, 1999; Swann, Boorman, & Papafotiou, 2004). Additionally, illicit drugs are also prevalent amongst non fatally injured drivers, with illicit substances including the predominate cannabis, found in anywhere between 2.7 and 41.3% of such drivers (Athanaselis, Dona, Papadodima, Papoutsis, Maravelias, & Koutselinis, 1999; Longo, Hunter, Lokan, White, & White, 2001; Soderstrom, Dischinger, Kerns, & Trifillis, 1995; Stoduto, Vingilis, Kapur, Sheu, McLellan, & Liban, 1993; Waller, Blow, Maio, Singer, Hill, & Schaefer, 1997). Not surprisingly, the illicit drug identified most often in the body fluids of drivers involved in motor vehicle crashes is cannabis. From an Australian perspective,

Drummer, et al. (2003), investigated drivers in fatal crashes from three Australian states (Victoria, New South Wales and Western Australia) and found a robust relationship between drug driving and culpability, with the accident risk estimated as high as a driver with a blood alcohol content of 0.1 to 0.15 percent. To address this growing road safety issue, the introduction of new detection methods is currently being implemented in a number of jurisdictions. More specifically, in Queensland, the implementation of Random Roadside Drug Testing has commenced and the effectiveness of this countermeasure is yet to be established.

Beyond those drug drivers involved in crashes, little research is available investigating the prevalence of the behaviour within the general community. The current community perspective of drug driving is that it is relatively rare (Kelly, Darke & Ross, 2004). In challenging this notion, the 2007 National Drug Strategy Household Survey (NDSHS) provides some support that drug driving may be quite prevalent in Australia. The survey enquired as to the activities undertaken while under the influence of illicit drugs, with 2.9% of Australians indicating driving a motor vehicle (AIHW, 2007). Additionally, one of the more useful reports exploring drug driving in the Australian community was published by the Australian Drug Foundation (ADF) (Mallick, Johnston, Goran, & Kennedy, 2007). The aim of the project was to capture a community-wide impression of drug driving behaviour. The most prominent finding was the self-reported extent of drug driving in the previous 12 months, with 12.3% of the sample indicating driving within three hours of using cannabis, whilst a proportion of drivers (6.9%) reported driving within three hours of using methamphetamines.

However, a growing body of research has revealed that the self reported extent of drug driving varies distinctly between 2% and 90% of respondents, although the majority of the research suggests between 3% and 10% (Kelly, Darke, & Ross, 2004). Regardless of this research, amongst some subcultures, researchers have suggested the prevalence of drug driving in the community is significantly higher (Akram, 1997; Terry & Wright, 2005). For instance, Akram (1997) found that amphetamine use among some samples was 62%, whilst more surprisingly, drug driving amongst a sample of cannabis users revealed a rate of approximately 82% (Terry & Wright, 2005). Overall, research has suggested that the common drug combined with driving is cannabis (Davey, Leal, & Freeman, 2007; Drummer, et al. 2003; Terry & Wright, 2005), which may in fact be related with the general perceptions that cannabis does not have a harmful effect on driving ability. Nonetheless, amphetamine use and driving are also regularly combined among some sub-groups of motorists (Albery, Strang, Gossop, & Griffiths, 2000; Kelly, Darke, & Ross, 2004; Davey, Leal, & Freeman, 2007).

Additionally, Australian research that has focused on university students or younger drivers have found similar results, with between 8.2% and 15% of motorists reporting driving after consuming some form of illicit drug. (Armstrong, Wills, & Watson, 2005; Davey, Davey, & Obst, 2005a). A similar Australian study that investigated the use of illicit substances in road crashes, indicated that 16.4% of injured motorists tested positive to cannabis and a further 6.9% tested positive to the presence of amphetamines (Caldicott, Pfeiffer, Edwards, Pearce, & Davey, 2007). In spite of this, the difficulty with capturing an accurate representation of drug driving in the general community rests on the fact that drivers arbitrated at fault in a crash are therefore more likely to be tested for the presence of drugs and consequently are shown in research and statistics of this kind (Drummer, Gerostamoulos, Chu, Swann, Boorman, & Cairns, 2007). As a result, the challenge of capturing a true representation of the prevalence of drug driving remains difficult.

The development and use of roadside drug testing of oral fluid, has significantly improved the chances of correctly ascertaining a better understanding of the extent of drug driving in the community, since testing is non- invasive and straightforward (Dolan, Rouen & Kimber, 2004; Speedy, Baldwin, Hand, & Jehanli, 2004). In contrast, research regarding sampling of body fluids has originally focused on sampling drivers involved in motor vehicle crashes or those drivers suspected of driving under the influence of illicit substances. Therefore the development of the oral fluid testing has allowed researchers to provide an estimate of the extent of drug driving on public roads, together with those involved in crashes. One such study in this area randomly sampled a group of motorists in Britain and found 4.7% of drivers were confirmed positive to the presence of drugs (Buttress, Tunbridge, Oliver, Torrance, & Wylie, 2004). However, in comparison, a much higher result was found in a study conducted in Germany, which suggested that 16.8% of randomly selected motorists confirmed positive to at least one illicit drug (Wylie, Torrance, Seymour, Buttress, & Oliver, 2005).

In the Australian context, one of the few studies in this specific area was conducted by the Victorian police who randomly tested motorists for the presence of drugs and found a drug driving prevalence rate of approximately 2.4% or one driver in 40 for substances including cannabis and amphetamines (Drummer, et al., 2007). Additionally, Davey, Leal and Freeman (2007), investigated the extent of drug driving amongst a sample of Queensland motorists recruited from a Random Breath Testing site and found that 3.5% of motorists tested positive to at least one illicit substance, which was significantly greater than the overall drink driving rates during the same period¹. Furthermore, another study adding to the gravity of the drug driving problem in Australia is a study by Poyser, Makkai, Norman and Mills (2002) who examined drug driving in a sample of traffic detainees from three Australian states. The authors collected samples over a three year period from 1999-2001 and included anyone who was being charged for a driving related offence. The major finding of the study was that 71% of the sample tested positive to one drug and over one third of the sample (37%) tested positive to more than one drug. These preliminary findings indicate that drug driving presents as a serious threat to road safety and additionally, warrants the need further research to determine the extent of non-crash drug driving rates in Australia, especially for drugs such as cannabis, amphetamines, ecstasy and cocaine.

As a result, the major objectives of the present study were to:

- Measure the extent of drug driving amongst a sample of Queensland drivers in a metropolitan area (Brisbane) and a regional area (Townsville);
- Investigate the self-reported frequency of general motorists' engaging in drug driving behaviour; and
- Compare the frequency of drug driving behaviours in a metropolitan area (Brisbane) against a regional area (Townsville).

Method

Participants, Materials and Procedure

Drivers stopped at Random Breath Testing (RBT) sites across 2 locations in Queensland (e.g., Brisbane & Townsville), were approached and asked by operational police to participate in the drug driving research, which was positioned on average 50 metres further down the road. Participation in the study was voluntary and withdrawal was permitted anytime without query.

¹ This sample is incorporated within the current study and takes the form of the regional sample.

Random drug detection had not yet officially commenced in Queensland during the trial, although such legislation had been enacted within Victoria. Data was collected at peak drink driving times such as during the late evenings/early mornings on Fridays and Saturdays. Participants were required to complete a self-report questionnaire regarding recent illicit drug use and drug driving in the previous 12 months, and provide a sample of oral fluid that could later be screened for the presence of drugs. Overall, the process took approximately 10-20 minutes to complete and drivers received a one-off payment of \$20 cash to repay them for their time. Data was collected over a two month period, on ten separate occasions, usually between the hours of 5pm and 1am².

A 12 item self-report questionnaire was designed to assess a variety of demographic data (e.g., gender, age, years driving) as well as self-reported drug use in addition to the frequency of drug driving behaviour. Participants responded to questions that examined the most recent use of marijuana / cannabis (within four hours, within the last 24 hours, within the last week, within the last month, within the last year, more than a year ago, have never used). This question was repeated for meth / amphetamines (such as speed, oil, base, and crystal), ecstasy, heroin and cocaine. Additionally, participants were also required to indicate how often in the previous 12 months they had operated a motor vehicle (including a motorcycle) within four hours of using marijuana / cannabis (every day, more than once a week, about once a week, 11 – 20 times, 3 – 10 times, once or twice, never). This question was also repeated for meth / amphetamines (such as speed, oil, base, and crystal), ecstasy, heroin and cocaine.

In addition, oral fluid samples were collected, stored and screened off-site at a later date using the Cozart® RapiScan oral fluid drug testing device. Participants provided a sample of oral fluid that was collected from inside their mouth via a pad held either under their tongue or beside the inside of their cheek. The five-panel cannabis and single-panel methamphetamine / MDMA test cartridges were used (i.e. each sample was screened twice). Each Cozart® RapiScan kit consisted of a collector, transport tube containing buffer solution, separator filter tube, pipette and test cartridge. The five-panel cannabis cartridge detected the presence of benzodiazepines, amphetamines, cannabis (THC), and cocaine, while the single-panel methamphetamine / MDMA cartridge detected the presence of methamphetamine and MDMA (ecstasy). There was no subjectivity in the interpretation of results as the Cozart® RapiScan testing instrument displayed and printed results.

Results

Demographics

A total of 2381 motorists from the Brisbane and Townsville area volunteered to participate in the study. Due to resourcing constraints and the referral process from the Police RBT site, it was not possible to obtain an accurate measurement of the response rate over the entire data collection period³. However, on one occasion in the Townsville region the response rate was assessed across two sites during a shift where an additional researcher counted the number of drivers approached to participate and noted their response. Drivers of 63 cars from a total of

² Workplace health and safety requirements resulted in the current roadside project only being implemented with the presence of the Queensland Police Service. RBT operations were deemed to be the most compatible roadside activity and thus drug testing procedures corresponded within traditional RBT operational hours e.g., 5pm – 1am.

³ The procedure usually consisted of RBT operational police officers informing motorists (who had given a breath sample) that they had the opportunity to participate in an anonymous research drug driving project being conducted approximately 100 metres down the road.

85 participated in the project, resulting in a response rate of 74.12%. A similar approach was taken on one occasion for the Brisbane area which confirmed a 71.4% response rate. In addition, over the entire study, six potential participants approached the research site, but declined to participate after being informed about the research procedure.

The sample was predominantly male, featuring 1487 (62.5%) males as compared to 873 (36.7%) females, with 21 participants electing not to provide their gender. Overall, the mean age of the sample was 28.88 years ($SD = 11.64$), with participant ages ranging between 16 and 75. To this end, average age was identified as a noteworthy difference between the participant groups, with the Brisbane group ($M = 30.05$ years, $SD = 12.01$) found to be significantly older than the Townsville group ($M = 26.32$, $SD = 10.40$), $t(1581) = 7.44$, $p < .001$). On average, participants had been driving for 11.04 years ($SD = 10.96$) with the majority of the sample reporting driving daily ($n = 1940$, 82.3%) or three to five times per week ($n = 358$, 15.2%).

Percentage Positive Drug Screening Tests

Screening analysis revealed that oral fluid samples from 92 drivers (3.86% of the total sample) contained at least one illicit substance. Chi-square analysis between the two regions revealed a similar proportion of respondents screened positive to at least one drug. Additionally, a comparison was undertaken between the drink driving and drug driving detection rates for the Townsville area which revealed that drug driving detection rates were substantially more prevalent (3.86%) than drink driving (0.8%⁴). Table 1 outlines the results by drug group detected in the two regions. As depicted in Table 1, the most common drug detected was ecstasy (MDMA) ($n = 51$), followed by cannabis (THC) ($n = 40$), amphetamines ($n = 20$) and cocaine ($n = 4$ cases). Differences between the two regions were identified on positive drug screening tests of cannabis, as participants in Townsville were significantly more likely to test positive to cannabis than participants in Brisbane $X^2(1, N = 2381, = 5.114, p = .024)$. The positive screening of amphetamines, ecstasy and cocaine revealed no significant differences between the two regions. In regards to poly drug use, 19 samples (0.79%) were screened as positive for 2 drugs, while 2 samples tested positive for 3 drugs.

Compared with the total participant pool, the 92 drivers who provided samples that were confirmed positive for at least one illicit substance were more likely to be male ($n = 73$, 79.3%), marginally younger than non-positive participants ($m = 25.2$ years, $SD = 7.96$) and had less driving experience ($m = 7.9$ years, $SD = 8.0$). Furthermore, males were 4 times more likely engage in poly drug use ($n = 16$, 84%). Overall, a similar proportion of participants in both regions tested positive to at least one drug.

⁴ Relatively few individuals charged with drink driving participated in the drug driving research, and thus the drug and drinking drivers consisted of separate samples.

⁴ 19 respondents screened positive to more than one drug

Table 1. *Number and Proportion of Positive Screening Tests by Drug Group*

	Total N = 2381	Brisbane N = 1587	Townsville N = 794
Ecstasy (MDMA)	51 (2.14%)	35 (2.21%)	16 (2.02%)
Cannabis (THC)	40 (1.68%)	20 (1.26%)	20 (2.52%)
Amphetamines	20 (0.84%)	17 (1.07%)	3 (0.38%)
Cocaine	4 (0.17%)	2 (0.13%)	2 (0.25%)
<i>Total Illicit Substances</i> ⁴	115 (4.83%)	74 (4.66%)	41 (5.16%)

Self-reported Frequency of Drug Driving

An investigation was also undertaken to examine participants' self-reported drug use and drug driving behaviours. Firstly, regarding drug use, the most commonly consumed drug was cannabis, with 23% reporting the use of the substance within the last year, and 8.2% of this group reporting usage in the last week. In contrast, only 8% reported amphetamine use in the last year and 7.1% MDMA/ecstasy use in the last year. A point to note is that in Queensland many illicit drug users refer to methylamphetamine as amphetamine. Additionally 2.4% reported using cocaine and 0.3% of the sample reported using heroin during the last year. Chi-square analysis revealed males were more likely to report regular cannabis use than females $X^2 (6, N = 2357, = 35.94, p <.001)$, while small cell sizes precluded analysis of the other substances. Lastly, differences were identified between the regions on self-reported frequency of drug use, as participants in Townsville reported higher frequencies of cannabis use, $X^2 (12, N = 2378, = 15.91, p =.014)$ than participants in Brisbane. However, small cell sizes again excluded further chi-square analysis of the drug types and regions.

Conversely, investigation of the self reported frequency of drug driving revealed the most common substance combined with driving was reported to be cannabis (see Table 2). More specifically, 4.4% of the sample reported using cannabis before driving at least once a week, whilst approximately 1.0% reported the use of amphetamines, and less than 1.0% reported cocaine or heroin use while driving in a week. Similar to the self reported use of cannabis, Townsville participants were significantly more likely to report driving under the influence of cannabis than Brisbane participants $X^2 (6, N = 2328, = 16.06, p = .013)$, whilst small cell sizes precluded analysis of the remaining drug types. Lastly, examination of the self-reported drug use for the 92 participants who screened positive to the presence of drugs revealed that drug driving was most common among these individuals. More specifically, 42 (45.6%) reported driving within four hours of using at least one of the drugs outlined on the questionnaire. This proportion is more than three times the proportion of the total sample of 2381 drivers that reported drug driving (358 drivers, 15%). Furthermore, 45 (48.9%) of the drivers who provided samples that were confirmed positive for at least one illicit substance reported drug driving frequently (that is, once a week or more). This is more than 7 times the proportion of the total sample that reported frequently drug driving (146 drivers, 6.1%).

Table 2. *Drug Driving Behaviour*

Drug Type	Cannabis		Amphetamine:		Ecstasy		Cocaine	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<i>Brisbane</i>								
Every day	26	(1.6)	3	(0.2)	1	(0.1)	0	(0.0)
More than once week	20	(1.3)	3	(0.2)	6	(0.4)	0	(0.0)
About once a week	19	(1.2)	12	(0.8)	4	(0.3)	0	(0.0)
11 - 20 times	14	(0.9)	12	(0.8)	7	(0.4)	6	(0.4)
3 - 10 times	18	(1.1)	12	(0.8)	20	(1.3)	5	(0.3)
Once or twice	76	(4.8)	28	(1.8)	58	(3.7)	22	(1.4)
Never	1399	(88.2)	1509	(95.1)	1481	(93.3)	1545	(97.4)
<i>Townsville</i>								
Every day	14	(1.8)	1	(0.1)	-	-	1	(0.1)
More than once week	13	(1.6)	2	(0.3)	-	-	2	(0.3)
About once a week	10	(1.3)	3	(0.4)	-	-	0	(0.0)
11 - 20 times	9	(1.1)	8	(1.0)	-	-	0	(0.0)
3 - 10 times	15	(1.9)	5	(0.6)	-	-	0	(0.0)
Once or twice	63	(8.3)	17	(2.1)	-	-	0	(0.0)
Never	632	(84.0)	722	(95.5)	-	-	755	(99.6)

Note: The questionnaire for reporting drug driving behaviour was modified to include ecstasy after testing had been completed in Townsville.

Discussion

The main objective of this study was to conduct an exploratory study to examine the extent of drug driving in both a sample of metropolitan and regional drivers. In particular, the study focused on determining the self-reported frequency of drug driving within the samples and the major drug types that are frequently combined with driving.

Positive Drug Tests

The first primary finding of the study was that 3.8% ($n = 92$) of the sample provided a positive illicit drug reading. This finding is consistent with previous preliminary research that has focused on randomly drug testing motorists through oral fluid analysis (Buttress, et al., 2004; Davey, Leal, & Freeman, 2007; Drummer, et al., 2007). Secondly, the results revealed that the detection rate for drug drivers, in the present study, appears considerably higher than the detection rates for drink drivers in Queensland (Davey, et al., 2007; Watson, Hart, Freeman, Tay, Davey, Madden, et al., 2005). Nonetheless, the current findings are still merely preliminary and the sample only focuses on two specific areas in Queensland e.g. Brisbane and Townsville. Therefore results may differ depending on the location that the sample is taken from. Even so, the findings of the study indicate that a substantial proportion of drivers may be at risk of drug driving, rather than drink driving, in the early hours of the morning. Additionally, the characteristics of drivers most likely to test positive to illicit drugs in the current context were more likely to be males and under 25 years of age. This finding is consistent with common drug research that has reliably found that males are more likely to consume illicit drugs and drive than females (Begg & Langley, 2004; Neale, 2004), in particularly engage in poly drug use (Milani, Parrott, Turner, & Fox, 2004).

In regards to the most common illicit substance combined with driving in the current study, cannabis was the most prevalent. Similarly, the frequency of positive drug tests in both the regional versus the metropolitan area also revealed that cannabis was more commonly combined with driving in Townsville, whilst ecstasy and amphetamines were frequently combined with driving in Brisbane. These particular findings are somewhat contrasting to recent research conducted in Queensland that indicated cannabis was the most prevalent combined drug with driving (Davey, Leal, & Freeman, 2007). Consequently, it appears that the frequency of particular drugs may yet be proven to be dependent on specific locations, although it is noted the findings need to be replicated with larger sample sizes. Further analysis also needs to be undertaken to determine whether differences in detection rates (e.g., cannabis vs ecstasy) are a true reflection of the prevalence of particular types of drug driving behaviours or in fact testing sensitivity issues.

Self-reported Frequency of Drug Driving

Examination of the self-reported data revealed that again cannabis was the most frequently consumed illicit substance, which is consistent with previous research. In regards to the most prevalent drug combined with driving in the different regions, cannabis was the most prevalent in the regional area, whilst ecstasy was the most common drug in the metropolitan area. Therefore, these findings suggest that the frequency of drug use and consequently drug driving may be dependent on the region that the sample is derived from. These findings are partially supported by previous research that has suggested cannabis to be the most prevalent drug associated with driving (Davey, Leal, & Freeman, 2007; Drummer et al., 2003; Seymour & Oliver, 1999; Swann, Boorman, & Papafotiou, 2004). Importantly, those participants who tested positive to the presence of an illicit substance also reported the highest frequency of drug driving. Finally, there were few differences identified between the regions on key measures such as the number of positive samples. The results indicate that drug driving may prove to be a state-wide problem, and additionally, that drug testing may have the capacity to detect a considerable proportion of motorists who consume illicit substances and drive.

Limitations

A number of methodological limitations related with the study should be taken into consideration when interpreting the findings. Firstly, the generality of the results may be limited as the sample was taken from two areas of Queensland (metropolitan and a regional area). Therefore it is possible that drug use and consequently drug driving may possibly differ by area due to differences in supply, cost, demand and potency of drugs. Therefore, the research reported here covers only a limited time frame and limited days of the week. Also, the comparison between drug and alcohol detections is questionable, since drug positives are based on presence but alcohol detections are based on legal limits, which underestimates the comparable drink driving figure. Additionally, the sample was skewed towards the younger age ($M = 28$ years), even though a wide age range was recorded. Due to the voluntary nature of the study, it was difficult to sample a group of drivers that were representative of all Queensland drivers. More specifically, the sample of this study may prove to be representative of drivers at night on weekends, which is nonetheless a peak drug driving period. Therefore it is possible that the frequency of drug driving may increase or decrease into the early hours of the morning as well as during the day. Additionally, the possibility of self-report and volunteer bias remains, and although the Queensland Police Service were not directly involved in the research project, it is likely that operational officer's presence at the research site discouraged some individuals from participating (especially those under the influence of drugs). Questions about the accurateness of saliva testing for illicit drugs in the current study also remain, as environmental contamination may negatively influence the

accuracy of oral testing (for example participants' presence in a room where cannabis is being smoked) (Davey, Leal, & Freeman, 2007). Lastly, in line with previous Queensland research, an additional limitation of this study was the delay between sample collection and screening, which may have possibly affected the reliability and consistency of the saliva samples. However, it was beyond the scope of the current study to screen and test the saliva samples at the roadside due to resourcing constraints. Thus it would be ideal to replicate and/or expand the current study with a larger sample of drivers across Queensland. Such information would further aid in the development and implementation of effective countermeasures aimed at reducing the prevalence of drug driving on public roads.

Nevertheless, the present study provides some confirmation that drug driving may be relatively prevalent in both regional and metropolitan areas in Queensland, and since research has associated illicit drugs with crash involvement, drug driving presents as a serious threat to road safety. Furthermore, as previous research has indicated that perceptions of apprehension certainty are a fundamental factor in deterring both drink drivers (Piquero & Pogarsky, 2002) and drug drivers (Davey, Davies, French, Williams, & Lang, 2005b) from engaging in offending behaviours, random roadside drug testing techniques therefore have the ability to become a practical method to increasing perceptions of apprehension certainty and consequently reducing the prevalence of drug driving. Thus, it would be beneficial to investigate motorists' current perceptions regarding the probability of being detected for drug driving, and their corresponding beliefs about the effectiveness and impact of saliva testing on offending rates. This information would greatly assist in the implementation of random road side drug testing methods currently being conducted in Queensland. Additionally, researchers have revealed that the Australian community is presently not adequately aware of the risks related with drug driving (Mallick, et al., 2007) and that additional research is necessary to ascertain the most effective methods to increasing drivers' perceptions regarding the harmful impact of illicit drugs on driver functioning. In conclusion, further exploration into drug use and consequently drug driving can only aid with the development and implementation of effective countermeasures directed at decreasing the prevalence of drug driving in the wider community.

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