

Reviews of the effectiveness of random drug testing in Australia: The absence of crash-based evaluations

Baldock, M.R.J. & Woolley, J.E.

Centre for Automotive Safety Research, University of Adelaide

Abstract

In Australia, roadside drug testing (RDT) is the chief means used to deter drug driving. Although it runs along similar lines to the more established method of random breath testing (RBT), it is considerably more expensive. Given the high cost in equipment and resources to undertake RDT, many jurisdictions have conducted reviews of the effectiveness and operations of their RDT program. Reviews have been undertaken of RDT and made publicly available in the states of Victoria, South Australia, New South Wales, Western Australia and Tasmania. Queensland are also planning to evaluate their program, although no report has yet been published. This paper examines the methodology of these reviews and discusses their findings to draw out policy implications for RDT in Australia. In terms of methodology, the RDT reviews have all focused on process evaluations and analysis of data pertaining to enforcement and detection. There have been no attempts to evaluate the effectiveness of RDT using a crash-based analysis. The reviews have been uniformly positive and supportive of the RDT programs introduced across Australia. Success has been claimed for RDT on the basis of increased detection of drug drivers following its introduction and some changes in the results of self-reported surveys about drug driving attitudes and behaviour. In most cases, a number of recommendations have nonetheless been made to improve the jurisdiction's RDT program. The lack of evidence of reductions in drug driving crashes, however, prevents the specification of a best practice model of RDT.

Introduction

Random breath testing (RBT) of drivers to detect the presence of alcohol has operated in Australia since the mid 1970s, beginning in Victoria, with other states introducing RBT in the 1980s. Roadside testing of drivers for the presence of drugs, however, is a far more recent road safety countermeasure, beginning in Victoria in December 2004. Other Australian jurisdictions soon followed Victoria's lead and also introduced RDT (Tasmania in July 2005, South Australia in July 2006, New South Wales in December 2006, Western Australia in October 2007, Queensland in December 2007, Northern Territory in March 2008 for drivers of heavy vehicles, and the Australian Capital Territory in May 2011).

Although roadside drug testing runs along similar lines to the more established method of random breath testing (RBT), it is considerably more expensive for a number of reasons. First, unlike RBT, each screening test unit is one-use only (in RBT only the plastic tube mouthpiece needs to be discarded after use). Second, evidentiary testing requires sophisticated laboratory analysis of biological samples (unlike RBT which only requires a subsequent breath test using an evidentiary machine). Third, the roadside screening tests used in RDT take considerably longer to perform than breath tests, resulting in greater delays to motorists and fewer tests per unit of time for police. Given the high cost in equipment and resources to undertake RDT, many jurisdictions have conducted reviews of the effectiveness and operations of their RDT program (Hall & Homel, 2007). Reviews of RDT have been undertaken in a number of Australian jurisdictions: New South Wales (Bryant, Stevens & Hansen, 2009), South Australia (Cossey, 2007), Tasmania (Prichard, Matthews, Julian, Bruno, Rayment & Mason, 2009), Victoria (Boorman, 2007), and Western Australia (Woolley & Baldock, 2009). Queensland are also planning to evaluate their program, although no report has yet been published. It is likely that other internal reviews have been undertaken that have not been published in a public forum.

The remainder of this paper discusses the drug driving enforcement reviews in Australian jurisdictions that have been made publicly available to determine whether RDT has proven to be a successful road safety countermeasure, and whether the reviews can assist in developing a best practice model for RDT.

Victoria

As noted in the Introduction, Victoria was the first jurisdiction to introduce roadside drug testing of drivers, and has provided the blueprint for the legislation and enforcement methods in other jurisdictions. Previous enforcement, based on legislation introduced in 2000, had relied on recognition of driver impairment to detect drug driving. In the first four years of that legislation, 588 drivers were charged, 53 per cent of whom were detected on the basis of observed impairment, with the remaining 47 per cent detected following a crash. Such enforcement, however, lacks the high visibility of RDT operations and so would have had little general deterrent effect (based on Homel, 1990). Furthermore, it is possible for drivers to be affected by drugs without observable impairment. An equivalent situation exists for alcohol, for which there are laws against driving with a blood alcohol concentration (BAC) above 0.05 g/100ml, a level at which the risk of a crash doubles but at which the typical driver does not exhibit visible impairment of the driver (Boorman, 2007).

The need for detection of drug affected drivers led to the introduction of RDT in 2004, commencing in December. The associated legislation was the *Road Safety (Drug Driving) Act 2003*. The overall method was based on RBT, as RBT was known to be effective and is well accepted by enforcement and legal practitioners, and by the general public (Boorman, 2007).

The drugs prescribed in the legislation were methamphetamine and delta-9-tetrahydrocannabinol (THC). THC is the psychoactive compound in cannabis and can be found in oral fluid in the hours after cannabis use. This contrasts with 11-*nor*-9-Carboxy-THC, the main metabolite of THC, which can be detected in blood or urine for weeks after use.

A review of the operation of the Victorian RDT program by Monash University Accident Research Centre, which was not published in the public domain, recommended that 3,4-methylenedioxy-*N*-methylamphetamine (MDMA, or 'ecstasy') be added to this list. This addition was adopted in 2006 and easily incorporated into the existing enforcement procedure, as the screening and laboratory tests for methamphetamine also detect MDMA, meaning that the same testing equipment could be retained.

The Victorian process involves an initial alcohol screen, which, if negative, is followed by an immunoassay screen for the prescribed drugs. A positive result is followed by the collection of a larger second oral fluid sample, which is screened using sophisticated apparatus. If positive, the sample is sent to the laboratory for evidentiary analysis (Boorman, 2007).

In the Victorian model, the legislation allows for testing of any driver at any time, similar to RBT, but Victoria Police are able to apply the process in a tactical manner according to operational objectives. Three broad methods of maximising the benefits of drug testing at the operational level are: (1) conducting RDT in conjunction with RBT in areas where intelligence indicates a high level of drug use, (2) targeting RDT at high risk drug user groups within the road transport industry, and (3) targeting RDT at high risk drug user groups attending 'rave' parties (Boorman, 2007).

Boorman (2007) reported on the figures from the first two years of RDT in Victoria. There were around 25,000 drivers screened at the roadside, 7,000 of whom were drivers of heavy vehicles. Methamphetamine was by far the most commonly detected drug (364 cases or 1.4%, ahead of 57 or

0.2% for THC). Among car drivers, the detection rate for any drug was 1 in 46, while among truck drivers it was 1 in 66 (Boorman, 2007).

Further analysis of these data was undertaken by Boorman and Owens (2009). It was noted that 489 drivers were convicted of drug driving offences and 17 drivers refused to comply. No charges were dismissed at court. The overall drug positive rate was 1 in 50 drivers tested. Of the samples positive at the roadside, only two per cent were found not to contain drugs in the laboratory (false positives). Drug positive drivers had an average age of 26, 80 per cent were male, 6.6 per cent were unemployed, 4.8 per cent were unlicensed, less than one per cent held a learner permit and just under 25 per cent were on a probationary licence. Drivers detected using the impaired driving enforcement program (that is, drivers apprehended by police for exhibiting signs of impairment rather than detected during RDT) were more likely than RDT-detected drug positive drivers to be older, unemployed, unlicensed and to have a criminal history. Drug types also differed, with impaired drivers more likely to be positive to anti-depressants and opioids. The authors concluded that there were three distinct groups of drug drivers: those using drugs recreationally, those abusing drugs (more likely to be detected by impaired driving enforcement), and those using drugs while driving as an occupation. The key conclusion was that “oral fluid testing is a sufficiently reliable and accurate detection mechanism for use by road safety law enforcement operations” (Boorman & Owens, 2009, p21).

Figures for Victoria from 2009 (Doecke & Grigo, 2011) indicated a total of 27,883 roadside screening tests in 2009. These tests yielded a total of 298 confirmed drug positive cases, a rate of 1.07 per cent of those tested, the lowest detection rate in Australia in 2009 (Doecke & Grigo, 2011). The fact that the detection rate in 2009 was the lowest in Australia is difficult to interpret. Figures quoted by McIntyre, Cockfield and Nieuwesteeg (2011) for 2010 indicate a total of over 40,000 tests and 700 detections, giving a higher detection rate of 1 in 60.

South Australia

South Australian legislation supporting RDT was introduced in 2006. The legislation also included provisions for the testing of drivers detected committing a traffic offence and for drug testing blood samples of drivers taken to hospital. A review of the introduction of RDT in South Australia by Cossey (2007) focused on the operation of the legislation but did not include any analysis of its road safety effect.

The South Australian system is similar to the Victorian model in terms of the use of three steps in the testing process and the use of oral fluid as the biological specimen being tested. Drivers positive at the roadside to THC are directed not to drive for five hours; those positive to methamphetamines are directed not to drive for 24 hours. These time periods were chosen on the basis of detection windows for the two drug types, as advised by Forensic Services SA. Someone who does drive can be arrested for disobeying a police directive. SA Police have prepared written instructions not to drive for these time periods so that all drivers are issued with consistent information. The details of the driver are entered into a system accessible by all police, in order to aid enforcement of the direction not to drive (A/Sergeant Peter Thompson, personal communication, 2012).

Cossey (2007, p6) described the implementation of RDT in South Australia as being “exemplary” and praised the following aspects of the RDT enforcement in South Australia:

- Training of staff.
- The equipping of the testing vehicles.

- The coverage of different regions of the state consistent with the population distribution.
- The degree of presence in metropolitan Adelaide.
- The maintenance of records and relevant statistics.
- The positive relationship between the SA Police and testing laboratory (Forensic Science SA).
- The documentation of any problems that needed to be addressed in the review.

In the first year of operation, SA Police tested 10,097 drivers, of whom 294 were positive to drugs (1 in 34). The most commonly detected drug by itself was methamphetamine (127 cases or 1.3%), followed by THC (77 cases or 0.8%) and MDMA (9 cases or 0.1%). For those testing positive to more than one drug, the most common combination was THC and methamphetamine (64 cases or 6.3%), followed by methamphetamine and MDMA (10 cases or 0.1%), all three prescribed drugs (5 cases or 0.05%) and THC and MDMA (2 cases or 0.02%). The five minutes required for the initial screening test to return a result were used by SA Police personnel to check for outstanding warrants and fines, defective vehicles and currency of licence and registration. This resulted in a total of 2,172 offences, reports or arrests in addition to those for drug driving (Cossey, 2007).

The review also included reference to an anonymous survey of 400 drivers at RDT sites waiting for the initial drug screen to produce a result. Rates of previous awareness of, approval of, and support for the program ranged between 80 and 100 per cent, except for belief that RDT would deter drug driving (65%). It should be noted that the surveys, although anonymous, were conducted by SA Police rather than an independent organisation and this raises questions regarding the validity of the results (Cossey, 2007).

The review did note a number of areas of concern for the RDT program that were recommended for attention. One of these was a higher than expected number of false positives (i.e. positive on the two roadside screening tests but negative in the laboratory). SA Police proactively addressed this through visits to Victoria and discussions with the manufacturers of the testing equipment. Following a change in the handling of the testing equipment, the rate of false positives subsequently declined. Other issues noted by the Cossey (2007) report, and which were subsequently addressed, included:

- Problems with determination of second or subsequent offences for drug driving when expiations (first offence) were not recorded as a conviction.
- The failure to link drug and drink driving offences for determination of second and subsequent offences (i.e. no 'interoperability' between the two offence types).
- The need for instant disqualification for refusal of testing rather than requiring a court appearance.
- The lack of consideration of drug dependence among offenders similar to consideration of alcohol dependence in treatment of drink driving offenders.
- Different penalties for drug and drink driving offences.
- The need for the ability of SA Police to outsource transportation of biological samples to medical couriers.

More recent articles by Thompson and Fairney (2010) and Thompson (2012) have described developments in the South Australian RDT program. Originally, a central drug testing group of 13 officers was responsible for the 10,000 annual roadside drug tests. In 2007, over \$11m was set aside for a four year period to enable expansion of RDT. This expansion required moving away from the centralised model. Enforcement section officers across the state were trained in RDT, allowing for testing to be conducted simultaneously in multiple locations and to be coordinated independently. The original central group remained to support the service level operations (Thompson & Fairney, 2010). Thompson (2012) reported that 615 officers in South Australia had been trained to undertake drug screening, with 328 also trained to undertake oral fluid analysis (the second stage of testing). This expanded model allowed South Australian testing numbers to exceed 40,000 per year and to reach a level per head of population four times greater than any other jurisdiction.

The article by Thompson and Fairney (2010) provided data for the years 2008/2009 and 2009/2010. In the first of these years, 39,510 tests detected 888 drug drivers for a rate of 1 in 44, with methamphetamine being the most commonly detected drug. In 2009/2010, there were 46,414 tests conducted, detecting 1,134 drug drivers at a rate of 1 in 41, with the most commonly detected drug being THC rather than methamphetamine. Rates of detection of MDMA dropped to very low levels, presumably reflecting low availability of the drug (Thompson & Fairney, 2010). In the following years, drug detections continued to rise, reaching a level of 1 in every 16 drivers tested in 2011/12. Methamphetamine again became the most commonly detected drug, detections of MDMA began to re-occur and cannabis detection rates in 2011/12 were around double those in 2009/10. Thompson (2012) explained the increases as being due to enforcement rather than increased drug driving. The expected level of testing in South Australia 2012/13 was 47,000 tests.

New South Wales

In New South Wales, the *Road Transport Legislation Amendment (Drug Testing) Act 2006* allowed for RDT to commence in December 2006. A review was conducted in 2008 to assess whether RDT was meeting the objectives of detecting and deterring drug drivers (Bryant, Stevens & Hansen, 2009). At the time of the review, 82 operations had been conducted, with 26 focusing on heavy vehicles. Of the 82 operations, 31 were held in rural areas, 21 in metropolitan areas and six at heavy vehicle checking stations. There had been 13,195 tests, including 4276 tests of heavy vehicle drivers. These tests yielded 365 drug positive screens (rate of 1 in 36), with methamphetamine the most commonly detected drug (223 cases or 1.7%), well ahead of THC (132 cases or 1.0%). During the testing, 255 drivers were caught drink driving and so would not have been drug tested. Additionally, NSW Police were able to detect a number of other offences, including 137 traffic charges, 76 unregistered vehicles, 54 unlicensed drivers, 20 criminal charges, 10 warrants executed, and 918 other traffic infringement notices (Bryant et al, 2009).

The authors of the review praised the standard operating procedures of the NSW Police and supported the use of a centralised group of drug testing personnel to ensure quality control. Bryant et al. (2009, p125) recommended that this centralised structure be retained “until a generational change in the collection devices allows a measured expansion of the operational capabilities of roadside drug testing to generalist police in an unsupervised environment.”

In terms of court outcomes, 73 per cent of drivers were issued with a fine and/or licence disqualification but 23 per cent were dealt with via Section 10 of the *Crime (Sentencing Procedure) Act 1999*, which allows a court that finds a person guilty of an offence to direct that the relevant charge be dismissed. The authors of the review argued that 23 per cent is “around half of the rate of section 10s given for low range prescribed concentration of alcohol offences” and that the 73 per cent figure for appropriately applied penalties “demonstrate that the evidentiary processes supporting the new drug driving offences are well accepted by the judiciary and the penalties viewed as appropriate by magistrates” (Bryant et al., 2009, p123). Despite these claims, it is hard to

reconcile the aims of specific deterrence with a court regime in which a quarter of drivers are not punished appropriately for the offence.

Bryant et al. (2009) also reported on the results of surveys of New South Wales motorists and drug users conducted in 2003 and 2008 (pre- and post-RDT). The telephone surveys were conducted by a consultant, Taverner Research, with methods used in the two surveys being similar, allowing for valid comparison of the results. Among recreational drug users (500 respondents), 80 per cent in 2008 were aware of RDT and the majority could identify that drugs tested for included THC, methamphetamine and MDMA. Of those aware of RDT, 61 per cent said that it decreased the likelihood that they would drug drive. Four per cent had been tested, 12 per cent knew someone who had been tested and four per cent knew someone who had tested positive. The comparison between survey results in 2003 and 2008 demonstrated increases in the perceived likelihood of detection, increased social disapproval of drug driving, and increased anxiety about drug driving. Self-reported drug driving also reduced from 4 to 3.6 per cent.

The authors of the review concluded that the survey results were all indicative of a degree of success for RDT. It was noted that results would be likely to be better if more publicity was given to the activity (Bryant et al., 2009).

A more recent paper authored by Rowden, Mazurski, Withaneachi and Stevens (2011) also provided an account of RDT in New South Wales. By the time of this paper, there had been 355 RDT operations in New South Wales, in which a total of 83,928 drivers were screened, yielding 1,646 drug positive cases (a detection rate of around 2%). The rate for heavy vehicles was 1.2 per cent compared to 2.2 per cent for light vehicles. The number of tests conducted had increased each year since the introduction of RDT, beginning with 6,434 in the first year and reaching 32,246 in the most recent year. The proportion of tests conducted in metropolitan areas had increased from 28 per cent in 2007 to 61 per cent in 2010, in keeping with findings of more drug positives in metropolitan areas (Rowden et al., 2011).

Similarly to South Australia, in 2010, THC surpassed methamphetamine to become the most frequently detected drug in New South Wales, while numbers of MDMA positives decreased markedly. Rowden et al. (2011) noted that there was evidence of decreasing purity of MDMA and decreasing arrests for possession, potentially indicating a decrease in availability of MDMA, which could explain the decreasing detection of MDMA in the oral fluid of drivers. The overall rate of drug positives had decreased over the history of RDT from 2.7 per cent to 1.9 per cent, which the authors attributed to general deterrence. Rowden et al. (2011) did, however, express concern that RDT was not conducted in all areas of the state and did not occur during all hours of the day, both of which could threaten general deterrence. It was also noted that Police in New South Wales are able to exercise discretion in choosing which drivers to test for drugs, rather than testing all of them, which could also reduce deterrence. This discretion with regard to which drivers are tested is exercised because of the high cost of testing and the need to allocate resources to maximise the likelihood of detecting drug drivers (Rowden et al., 2011).

Western Australia

In 2007, the Western Australian *Road Traffic Act 1974* was amended to allow for new police enforcement practices designed to reduce the incidence of drug driving. The *Road Traffic Amendment (Drugs) Act 2007* included provision for the offence of driving with the presence of a prescribed illicit drug in oral fluid or blood, with the prescribed drugs again being THC, methamphetamine and MDMA. After 12 months of the operation of RDT, a review of the legislation was conducted by Woolley and Baldock (2009).

Similarly to the centralised program in New South Wales praised by Bryant et al. (2009), Western Australia's Breath and Drugs Section was assessed by the reviewers as being well-equipped and the establishment of a higher than usual supervisory environment within this group was identified as responsible for the operational integrity of the program. Data for the first 13 months of the program were analysed, revealing that 9,716 screening tests were conducted in 989 hours of enforcement. The proportion of tests in rural areas was 34.4 per cent, achieving the 30 per cent target set at the commencement of RDT. Just over five per cent of the initial roadside screening tests produced positive results but 20 per cent of these drivers were assessed as drug negative by the secondary screening test. The most common confirmed drug cases involved methamphetamine alone (40% of all cases) and methamphetamine combined with THC (23%) (Woolley & Baldock, 2009).

All oral fluid samples collected during the secondary screening test, whether they were positive or negative, were analysed at the Chemistry Centre WA (CCWA) as part of the initial implementation. It was found that only 11 per cent of these samples were drug negative (compared to 20 per cent on the secondary screening test), revealing that the secondary screening apparatus was failing to detect the presence of drugs in a sizeable proportion of cases. Further analysis of the data revealed that the test performed especially poorly with regard to detecting the presence of THC (a sensitivity of 34 per cent, or 41 per cent taking into account the published cut-off concentrations for the test). The CCWA staff contacted the manufacturers and new testing kits were made available. The reviewers recommended that negative samples continue to be analysed to evaluate the performance of the second screening test (Woolley & Baldock, 2009). Other recommendations by the reviewers included but were not limited to the following:

- Penalties for all impaired driving offences be reviewed.
- Educational briefings be provided to Magistrates and Prosecutors on a regular basis.
- Additional variables be added to the drug testing database (gender, age, vehicle type - commencing with the initial screening test).
- No change to the list of prescribed drugs.
- No general rollout of RDT (i.e. retention of the centralised program structure).
- Regular communication with other jurisdictions be formalised.
- A future crash-based evaluation be conducted (Woolley & Baldock, 2009).

More recent figures from Western Australia (2009 data) indicate a total number of annual tests of 7,527, which is 0.33 per cent of the state population. The detection rate from these tests was 3.81 per cent, the highest of all jurisdictions using a similar RDT method (Doecke & Grigo, 2011).

Tasmania

Tasmania's system of roadside drug testing of drivers differs from those of other Australian jurisdictions. The two main ways in which the Tasmanian system differs from those used in other states are that a blood sample is required for the evidentiary testing and the list of prescribed drugs is considerably longer. Drug testing can be done either randomly, when a police officer suspects a driver is impaired, following an offence, or following a crash. Police can request a blood sample from a driver even if the oral fluid screen is negative if they suspect impairment but the blood sample needs to be taken within three hours. The blood sample is divided into three parts: one part for the laboratory test, one part for the police and one part for the driver. A report on the sample is provided to the driver after production of the laboratory report. Unlike other jurisdictions in which

care has been taken to ensure biological samples are used only for drug testing for road safety purposes, in Tasmania the blood sample can be used to gain a search warrant of the driver's premises or as evidence for a drug-related offence. The drugs prescribed in the Tasmanian legislation are a long list of illicit drugs known to cause impairment: amphetamine, cocaine, THC, heroin, gamma-hydroxybutyric acid (GHB), ketamine, lysergic acid diethylamide (LSD), Quaalude, MDMA, morphine, DET (diethyltryptamine), DMT (dimethyltryptamine), PCP (phencyclidine), and psilocybin (magic mushrooms). A review of the legislation after three years was conducted by Prichard, Matthews, Julian, Bruno, Rayment and Mason (2009).

The review found that 52 per cent of drug tests were based on RDT, 14 per cent followed a traffic offence, six per cent were due to driver conduct, and five per cent followed a road crash. The remaining 23 per cent of drug tests were undertaken for a variety of reasons, including recognition of the driver as a known drug user. Of all oral fluid screening tests, 68 per cent were negative, 30 per cent were positive and two per cent were invalid. This high rate of drug positive cases is indicative of the non-random nature of the testing. The targeted nature of the testing is due to the need for cost-effective use of resources and the aim of detecting as many drug drivers as possible using these resources. Of the drug positive oral fluid screens, 94 per cent of drivers' blood samples confirmed that the driver was positive to drugs. Some of the cases in which different results were found in the screening and evidentiary tests could be explained by different cut-off concentrations in oral fluid and blood. The authors of the review argued that the lack of baseline data for many of the key performance indicators of the drug testing program meant that a valid quantitative assessment of the effectiveness of the legislation was not possible. They did claim, however, that, given the relationship between drugs and road crashes, the increase in detection of drug driving was likely to "have had a positive impact on improving road safety in Tasmania" (Prichard et al, 2009, p39-40).

Summary: Methodology

A number of Australian jurisdictions have undertaken reviews of their RDT programs and made these reviews publicly available. These reviews have focused on process evaluations (training, equipment, relationships between stakeholders et cetera) and analysis of data pertaining to enforcement and detection. Key variables have included the number of screening tests, the number of confirmed positives for different drugs, and the overall detection rate. The overall detection rates are difficult to interpret, given the use of targeted operations (heavy vehicles, high drug use areas, proximity to events associated with drug use such as rave parties) and the discretion to choose particular drivers to test from a line of vehicles at RBT sites. That is, detection rates would be affected by operational factors to a greater degree than any changes in the rate of offending among the driving population.

In Western Australia, the authorities took the step of analysing samples in the laboratory that had been found to be negative by the second screening test. This allowed them to identify that the second screening test was failing to detect drugs in a significant proportion of samples that were drug positive, particularly failing to detect THC. This allowed for steps to be taken to address the problem.

Surveys of drivers have been used to measure deterrence. Variables measured have included perceived likelihood of detection for drug driving, social disapproval of drug driving, anxiety about drug driving, and self-reported frequency of drug driving.

The ultimate measure of the effectiveness of RDT would be the reduction in the number of drug-related road crashes. None of the reviews included crash-based data analysis.

Summary: Findings

The reviews were uniformly positive and supportive of the RDT programs introduced across Australia. In most cases, a number of recommendations were nonetheless made to improve them.

All states have maintained a centralised model, except for South Australia, where RDT has been rolled out across all traffic police (with provision of appropriate training). This expansion beyond the centralised model has allowed South Australia to conduct the highest number of roadside drug tests in the country, both in per capita and overall terms. Reviews elsewhere have argued against expansion beyond the central model, chiefly in the interests of quality control and maintenance of the integrity of collected biological specimens during collection, labelling, transportation and storage. In New South Wales, it was recommended that a centralised structure be maintained until a new generation of simpler screening devices are available.

In two states, reference was made to other policing activities conducted while RDT was in operation, making use of the time available for the initial screening test to be completed. These activities resulted in convictions for a range of other traffic offences, including unlicensed driving, unregistered vehicles, vehicle defects, outstanding warrants, and others. This represents an efficient use of police resources during RDT operations.

Detection rates have generally been in a range between 1 in 30 to 1 in 70, except for a much higher rate in Tasmania, which uses a different system to other states. Methamphetamine has traditionally been detected more than THC despite greater self-reports of driving after use of cannabis, greater involvement of THC in crash-involved populations, and greater population use of THC than methamphetamine. This is likely to be due to targeting of populations more likely to use methamphetamine (truck drivers, attendees of rave parties), the fact that methamphetamine has a longer window of detection than THC, and the likelihood that the screening tests perform better at detecting methamphetamine than THC. Interestingly, in recent years, THC has been detected more often than methamphetamine in South Australia and New South Wales, possibly indicating declining use of methamphetamine. Rates of detection of MDMA have decreased, likely to be reflecting reduced availability of the drug.

Success has been claimed for RDT on the basis of increased detection of drug drivers following its introduction and some changes in the results of self-reported surveys about drug driving attitudes and behaviour.

The lack of crash-based evaluations: Methodological issues

Given that reducing drug driving prevalence is an objective of traffic law enforcement because it is viewed as a potential means of reducing overall crash numbers, the proportion of crash involved drivers positive to drugs is the most important outcome measure for an RDT evaluation. Therefore, it is unfortunate that, as this review has indicated, there have been no evaluations of the effect of RDT on the rates of drug driving-related crashes. To undertake such an evaluation, it would be necessary to compare rates of crash-involved drivers testing positive to the prescribed drugs before and after the introduction of RDT. Such an evaluation would pose a number of methodological challenges.

In order to obtain valid measures of drug involvement in crashes, drivers need to be tested for drugs reliably following road crashes. Ideally, all drivers would be tested for drugs using the same biological specimen (e.g. blood). In some jurisdictions, all participants in road crashes above a certain age who attend a hospital have a blood sample taken which is then tested for alcohol and prescribed drugs. If drug testing is conducted as a matter of routine, the data are more likely to be reliable and provide a sound basis for research. Where testing for drugs is not routine and takes place at the discretion of police, there is a greater likelihood that a proportion of drug positive drivers will not be detected.

Usually, fatal crash data provide the highest likelihood of full sets of drug involvement data. This is because toxicological analyses are usually performed on deceased crash participants and the crashes are investigated in greater detail than are crashes of lower injury severity. For crashes with low levels of injury severity, data on drug involvement are more likely to be missing or unreliable.

It is important for an evaluation that the processes for drug testing are consistent in the periods before and after the introduction of enforcement. A change in the way in which biological samples are tested, or a change in the likelihood of a sample being taken for testing (e.g. a shift from discretionary to mandatory drug testing) will affect the comparability of results from the two time periods.

Another consideration with crash-based evaluations is that statistical tests used to assess differences in crash numbers require sufficient sample sizes in order to be able to detect a difference. If the number of drug-driving crashes is too small, it will not be possible to demonstrate a statistically significant difference between two time periods. As there are few fatalities in most individual Australian jurisdictions and drug driving cases only make up a fraction of these, fatal crashes often do not provide a sufficient sample size for statistical testing. If testing processes are sufficiently reliable for crashes of lower injury severity, then these should be included to increase the sample sizes used in the statistical analyses. The lack of crash-based evaluations of RDT in Australian jurisdictions is likely to be due to insufficient drug-related crash data to provide sufficient statistical power.

Implications

The chief implication of the lack of a crash-based evaluation of Australian RDT programs is that there is no indicator of the road safety benefit of this form of enforcement. Data exist to assess the trends in detection rates but it is open to question whether suitable data exist to assess trends in drug driving crash rates. In order to establish the effectiveness of Australian RDT enforcement operations and to provide an evidence base for determination of a best practice model of RDT, it is necessary for Australian jurisdictions to assess the suitability of available crash data and associated toxicological data to see if a before and after RDT evaluation is possible. If not, data collection regimes need to be introduced to collect such data into the future, so that trends in drug driving crash rates can be followed and be used as a performance indicator for RDT enforcement in Australia, and to evaluate the outcomes of any changes to enforcement practices.

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