

# Drugged driving in South Africa

An urgent need for review and reform

Jade Liebenberg, Lorraine du Toit-Prinsloo,  
Gert Saayman and Vanessa Steenkamp\*

jadel92@hotmail.com

lorrainedutoitprinsloo@gmail.com

gert.saayman@up.ac.za

vanessa.steenkamp@up.ac.za

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*Driving under the influence is a major threat to road safety in South Africa. Various psychoactive substances (both licit and illicit) have the potential to adversely affect driving performance and increase the probability of a road traffic accident. While it is common practice in South Africa to test drivers for alcohol levels, testing for additional impairing substances (including drugs of abuse) is rarely performed. In terms of current South African legislation, only driving under the influence of alcohol and a 'drug having a "narcotic" effect' is prohibited. This excludes several impairing psychoactive drugs which are not classified as narcotic substances. The aim of this article is to highlight issues and/or limitations surrounding drugged driving and to propose appropriate considerations for revision of the National Road Traffic Act. We also recommend revising existing legislation to include a comprehensive statutory definition and detailed provisions for drug testing to deter impaired driving.*

Driving under the influence of drugs (DUID), also referred to as drugged driving or drug impaired driving, may be defined as the operation of a motor vehicle whilst under the influence of one or more psychoactive drugs.<sup>1</sup> The latter

includes both illicit and licit substances (e.g. central nervous system depressants, stimulants or hallucinogens), which have the potential to impair driving performance and pose a danger to public road users.<sup>2</sup>

Road traffic injuries are a leading cause of preventable death in South Africa.<sup>3</sup> In 2015, it was reported that road traffic injuries resulted in 12 944 deaths (23.5 per 100 000 population) at a cost of approximately R143 billion to the state, communities and individuals.<sup>4</sup> In addition, South Africa is faced with a continuing challenge regarding drug and alcohol abuse,

\* Jade Liebenberg is a Masters of Medical Criminalistics graduate from the Department of Forensic Medicine at the University of Pretoria, Lorraine du Toit-Prinsloo is a forensic pathologist appointed as an extraordinary lecturer in the Department of Forensic Medicine at the University of Pretoria, Gert Saayman is the Head of Department of Forensic Medicine at the University of Pretoria and the Chief Specialist, Forensic Pathology Service Gauteng Health and Vanessa Steenkamp is the Head of Department of Pharmacology at the University of Pretoria.

having the largest illegal drug market in sub-Saharan Africa.<sup>5</sup> The social and economic cost of illicit drug and alcohol abuse in the country has been estimated at 6.4% of the annual gross domestic product.<sup>6</sup>

Driving under the influence (DUI) is a major threat to road safety in South Africa, with the limited available statistics indicating that approximately 58% of road traffic fatalities involve alcohol (based on National Injury Mortality Surveillance System data from 2010).<sup>7</sup> However, the prevalence of road users in South Africa who use and/or abuse non-alcoholic impairing substances, which may impair driving ability, remains mostly unknown. This is primarily due to the little to no routine drug screening performed on drivers during random stops, and drivers who have been involved in accidents are seldom tested. This lack of screening and testing is exacerbated by the lack of regulated drug testing available in South Africa.<sup>8</sup>

Driving under the influence of alcohol and/or drugs in South Africa is regulated by the National Road Traffic Act 93 of 1996 (NRTA/The Act) which states that:

- No person shall on a public road –
- (a) drive a vehicle; or
  - (b) occupy the driver's seat of a motor vehicle the engine of which is running, while under the influence of intoxicating liquor or a drug having a narcotic effect.<sup>9</sup>

The Act also defines the legal limits for alcohol (ethanol) in the blood and breath of drivers and thereby sets the standard by which drivers can be charged or prosecuted for DUI of intoxicating substances. The wording of this law however raises substantial concern, as only 'narcotic' drugs are mentioned, despite the fact that a vast number of impairing drugs (both medicinal and non-medicinal) do not fall within this classification. Examples of such non-narcotic drugs are illicit stimulants

(crystal methamphetamine) or cannabis (delta-9-tetrahydrocannabinol).

There is evidence to suggest that the prevalence of drugged driving may be as much of a concern as drunk driving. Results from the 2013–2014 National Roadside Survey in the United States found that the prevalence of impairing illegal drugs among weekend night-time drivers was 15.2%, compared to 8.3% who tested positive for alcohol. Legal (over the counter and/or prescription) medications with impairing effects were detected (separately) in a further 7.3% of weekend night-time drivers.<sup>10</sup>

In a study carried out in South Africa in 2008, drugs of abuse (excluding alcohol) were detected in 14% of drivers stopped at routine roadblock operations.<sup>11</sup> This study concluded that only 76% of drivers under the influence were being detected under current enforcement procedures though breath alcohol roadside testing alone. This figure may well have changed substantially in the past decade as a result of altered patterns and prevalence of substance use.

The aim of this article is to highlight critical issues and limitations in the detection of drugged driving in South Africa and to propose appropriate revisions to the NRTA to more effectively detect and prevent drugged driving.

## **Driving under the influence of alcohol**

Alcohol is known to impair driving-related abilities, such as concentration, hand-eye coordination and reaction time.<sup>12</sup> In South Africa, the NRTA states that it is illegal to drive while under the influence of an intoxicating liquor or when the blood alcohol concentration (BAC) or breath alcohol concentration (BrAC) is in excess of a specified level. Under current legislation, a non-professional driver is considered impaired if found to have a BAC  $\geq 0.05$  g/100 mL of blood<sup>13</sup> or a BrAC  $\geq 0.24$  mg/1000 mL of expired air.<sup>14</sup> The

relationship between BAC and impairment has been well studied internationally. Research has shown that the risk of being involved in an accident increases significantly when the driver's BAC is  $\geq 0.05$  g/100 mL, in comparison to drivers who have not been drinking.<sup>15</sup> Levels in the same range are considered illegal in Australia, Belgium, France and Switzerland, among others.<sup>16</sup>

The NRTA also states that no person may refuse that a blood or breath specimen be taken for purposes of law enforcement. Traffic officers may stop any vehicle and request the driver to perform a preliminary breath test (PBT) for alcohol (an initial screening test). If the driver is found to be over the breath ethanol limit based on the screening test, officers may request that a blood sample be collected for confirmation. A laboratory confirmation of the BAC is required as evidence by the courts in order to prosecute an individual for DUI. Evidential breath testing (EBT) may also be conducted by law enforcement, using appropriate apparatus which requires strict maintenance and calibration to ensure reliable accuracy, precision and measurement uncertainty (in compliance with the requirements of the South African National Standard SANS 1793:2013).<sup>17</sup> In the past, the results obtained from EBT devices were permitted as evidence in court subject to compliance with all the relevant regulations, preconditions and further requirements relating to the EBT device. However, the reliability of results obtained from such a device was successfully disputed in *S v Clifford Joseph Hendricks*, where the Cape High Court ruled that results from certain types of breath alcohol testing apparatus (the Dräger Alco test) were inadmissible for evidentiary purposes.<sup>18</sup> At present, the use of these types of apparatus remain controversial in South Africa, and very few cases have been brought before the courts based on results generated using this equipment.

Results obtained from tests conducted on patients who have been admitted to emergency rooms after sustaining injuries in road traffic accidents are seldom used in subsequent legal proceedings. This results from various factors, including breaks in the chain of custody, problems with the sample used for analysis and method of screening used. Hospital laboratories typically use serum samples with an enzymatic-based alcohol testing.<sup>19</sup> In the clinical setting, priority is given to attending to victims' injuries, which means that the accuracy of the results obtained from the analyses performed in hospital or in clinical pathology laboratories may not hold up in court.<sup>20</sup> It is routine practice at most South African medico-legal mortuaries to collect a blood sample at autopsy from fatally injured drivers for BAC analysis.<sup>21</sup> Blood samples are, however, not routinely collected at autopsy and analysed for substances other than alcohol. Such additional screening is only done at the discretion and specific request of the attending forensic medical practitioner, and is used based on incidental information provided by law enforcement officials to suggest that such investigations are warranted. This additional incident information is frequently not available.

## **Driving under the influence of drugs**

Assessing and interpreting the impairing effects of various drugs on driving is more complicated than with alcohol intoxication. Studies have reported that use of various psychoactive drugs, and/or a combination of two or more drugs, has the potential to adversely affect driving performance and increase the risk of a road traffic accidents.<sup>22</sup> These trends have been derived mostly from epidemiological research, relative risk studies and the prevalence of drug use in arrested and/or accident-involved (fatal and non-fatal) drivers.<sup>23</sup>

Results from the Driving Under the Influence of Drugs, Alcohol and Medicines (DRUID)

project in Europe indicate an increase in the relative risk of being seriously injured or killed when testing positive for drugs, particularly in the case of multiple drug use or drug use in combination with alcohol: a highly increased risk (5–30 times higher) was reported for amphetamines, followed by a medium increased risk (2–10 times higher) for cocaine, illicit opiates, benzodiazepines, sedatives and medicinal opioids.<sup>24</sup> This report notes, however, that some of the risk estimates were based on few positive cases and/or controls, which resulted in wide confidence intervals. Although non-alcohol drugs are associated with an increased probability of being involved in an accident, the risk in most cases is considered low to moderate for individual drugs.<sup>25</sup> However, the risk is greatly increased when the substance is taken in combination with alcohol or other drugs.<sup>26</sup>

In Australia, Drummer et al conducted a multi-centre case control study on fatally injured drivers (n = 3398) in which a significant association with crash culpability was observed in cases where drug/s (licit or illicit) were detected at post mortem (odds ratio = 1.7).<sup>27</sup> It was also found that drivers testing positive for tetrahydrocannabinol (THC) combined with alcohol (BAC ≥ 0.05 g/100mL), were 2.9 times more likely to be responsible for the crash in comparison with drug-free drivers with BACs ≥ 0.05 g/100mL.<sup>28</sup> Ogden et al reported in Victoria (Australia) that 75% of injured drivers testing positive for one drug, 77% for two drugs, 93% for three drugs and 100% of those testing positive for four drugs, were determined to be responsible for the accident.<sup>29</sup>

Existing research on drugged driving (conducted in countries such as Australia, Sweden, Spain and the US) has shown that drugs of abuse are present in the body fluids (mostly blood) of 8.8% to 39.6% of fatally injured drivers.<sup>30</sup> This is clearly a pervasive problem the world over.

## Drug-related impairment

Despite growing evidence that many drugs impair critical driving skills, it is still challenging to accurately demonstrate the correlation between the presence of a drug in the body and an associated level of impairment.

This means that drugged driving is seldom successfully identified or prosecuted.<sup>31</sup> DuPont et al identify three general classifications of drugs that can impair driving (according to the scheduling status of the South African Medicine and Related Substances Act 101 of 1965):<sup>32</sup>

- i) Controlled or illegal substances (Schedule 7 and 8) that are commonly abused. These include heroin, methylenedioxymethamphetamine (MDMA), cannabis, methaqualone or gamma-hydroxybutyrate (GHB). Access to these highly addictive drugs is tightly controlled, and it is an offence to be in possession of these drugs without an appropriate permit.<sup>33</sup>
- ii) Prescription medications typically include Schedule 3, 4, 5 and 6 substances, which include opioids such as oxycodone, methadone and buprenorphine as well as benzodiazepines such as alprazolam, clonazepam and diazepam. These medications have approved medical uses and may only be prescribed by a physician, but are frequently misused and/or abused and taken without a prescription or for ulterior purposes.
- iii) Certain medicines can be sold over the counter (OTC), without a prescription and include Schedule 0, 1 and 2 drugs. These drugs, although not commonly abused, may have the ability to cause sedation, such as with most antihistamines.

Although attempts have been made to assess the relationships between drug and/

or drug metabolite concentrations in biological samples and levels of impairment, this evidence remains unclear.<sup>34</sup> Establishing drug impairment thresholds (similar to BAC limits), is complicated by the wide range of drugs available, the infinite number of drug-drug and drug-alcohol combinations, as well as their complex physicochemical, pharmacokinetic and pharmacodynamic properties.<sup>35</sup> Analytical factors that influence the determination of drug levels may include the detection limit of the particular analytical technique used, the chemical properties of the drug and the type of sample used.<sup>36</sup>

A detectable concentration of a drug in testing does not necessarily imply impairment at the time of driving, as detection times vary for different substances and between biological matrices.<sup>37</sup> The duration of detection depends on the dosage, the route of administration, acute versus chronic use and individual variation in metabolism. Individual tolerance plays a significant role in the level of impairment as chronic drug users require increased dosages to produce the desired effect.<sup>38</sup> Other individual variances that play a role include, among others, the rate of drug metabolism (slow, rapid/ultra-rapid metaboliser), age, gender and state of health. The degree of impairment also depends on whether the individual is experiencing acute intoxication or withdrawal.<sup>39</sup> Additional variables that may affect driving performance specifically are, among others, the level of fatigue, the driver's age and driving experience, time of day, and/or environmental distractions.<sup>40</sup>

### **International legislation pertaining to driving under the influence of drugs**

Per se standards, which make it a DUI offence to drive with a measured quantity of certain drugs in one's system, are often used in legislation to address drug impaired driving.<sup>41</sup> There are generally two types of per

se standards: zero-tolerance drugged driving laws (which are defined according to the limits of detection using valid and reliable laboratory methods)<sup>42</sup> and per se laws that stipulate non-zero thresholds for drugs or their metabolites, which constitute evidence of drugged driving.<sup>43</sup> The application of these per se laws, therefore, make it illegal to drive a vehicle with a specified level of a drug present in a certain specimen obtained from the body, or in fact the mere detection of the drug itself, with no further evidence of impairment (or lack thereof) required.<sup>44</sup>

Per se laws pertaining to driving under the influence of drugs other than alcohol, are practiced in many countries including the US, Canada, Australia, New Zealand, United Kingdom and certain Western European nations, such as Belgium, Finland, Sweden and France.<sup>45</sup> As of April 2017, 22 states in the United States had adopted per se laws for DUID other than alcohol, seven of which specify non-zero thresholds for certain drugs.<sup>46</sup> Sixteen states have zero tolerance laws, where any (reliably) measured presence of a controlled substance in the body while driving is an offence. There is some variation regarding the marijuana impairment driving laws in certain states, due to their different legalization status.<sup>47</sup> All Australian states have laws prohibiting the operation of a vehicle while under the influence of methamphetamine, MDMA or ecstasy and THC.<sup>48</sup> In the UK, new drug driving legislation was promulgated as of March 2015 in England and Wales, which stipulates drug thresholds in blood for eight commonly abused drugs, as well as certain prescription medications.<sup>49</sup>

How legislation is enforced, and the penalties associated with an offence differ across countries. The World Health Organisation (WHO) sets out a framework for the management of DUID,<sup>50</sup> which requires establishing the legal framework for DUID

laws, testing for the presence of drug use (such as roadside testing), enforcement of the laws, raising awareness to the effects of DUID, as well as counselling and/or support for offenders.<sup>51</sup>

The management of DUID of South Africa should address all areas contained in the WHO policy brief.<sup>52</sup> Arrive Alive is a well-known on-line road safety awareness programme in South Africa, which could be used as a forum to create awareness of DUID and promote the proposed legislation and enforcement strategies.<sup>53</sup>

### **Testing for drugged driving in South Africa**

The laboratory analysis of biological samples for drugs of abuse (especially for law enforcement purposes) is costly and may involve a considerable delay in obtaining results. Drug testing procedures need to be as efficient and cost effective as possible and results must be accurate and able to withstand scrutiny in an adversarial legal system. Blood and urine are the most commonly used specimens in toxicological investigations.<sup>54</sup> A blood specimen is considered the best specimen for confirmatory analysis in DUI investigations due to the short detection period.<sup>55</sup> There are also distinct advantages of utilising blood specimens in terms of the wide variety of analytical methodologies available, numerous published reference data for both ante mortem and post mortem drug concentrations, short detection periods and the quantitative or interpretive value.<sup>56</sup> There are, however, drawbacks for these biological matrices. For example, collection of blood is invasive and typically requires transporting a suspect to a clinic to collect a sample, whilst urine has limited quantitative value as the detection times for drugs or metabolites are very variable (from a few hours up to a month). The positive identification of a substance in urine therefore

only indicates exposure to the particular substance, and is not necessarily related to impairment.<sup>57</sup>

Oral fluid (saliva) sampling offers certain advantages over blood and urine for DUI investigations. It is minimally invasive and can indicate recent use proximate to the time of driving.<sup>58</sup> Oral fluid screening technology is advancing and testing devices are becoming more robust and reliable.<sup>59</sup> Several countries now use these testing devices to screen for drugs of abuse.<sup>60</sup> Although these devices can provide a preliminary result, oral fluid screening is not evidential in nature and may still frequently yield false negative or false positive results. Confirmatory analysis is therefore mandatory in forensic investigations. Oral fluid screening devices have previously been tested in South Africa during standard roadblocks.<sup>61</sup> Drugs were detected in 14% of the 269 drivers who were tested, and both alcohol and drugs in 5% of cases. Based on the ease of use and accuracy, roadside oral fluid testing devices have the potential to assist law enforcement to reduce drug-impaired driving in South Africa.<sup>62</sup>

There is much debate on whether the mere presence of a drug(s) is substantial enough to suggest impairment, or whether it is necessary to quantitate the levels of a drug. Per se laws, or more specifically zero tolerance laws, could be rationalised for illicit drugs – since if possession is illegal, it is reasonable to prohibit driving under the influence thereof.<sup>63</sup> The same does not apply to impairing licit drugs (prescription and/or over the counter medications). Implementing per se limits for licit drugs is not as straightforward as legitimate medical use (with a valid prescription) of certain medications, which can also result in impairment.<sup>64</sup> Appropriate precautions and/or penalties should therefore be considered for drivers under the influence of certain medications based on whether they are in



possession of a valid prescription; whether the medication is being used as prescribed by the physician or pharmacist (conforming with warnings or guidelines pertaining to driving), and not used in combination with other impairing substances (e.g. alcohol or illicit drugs).<sup>65</sup> According to the WHO, 159 countries have legislation regarding DUID but the majority of these laws lack a proper definition for what is classified as a drug.<sup>66</sup> It may thus be appropriate, in the South African setting, to establish a working committee in order to define which drugs to prohibit while driving and to decide if per se or zero tolerance limits should be adapted. The suggested penalties if a driver is found guilty should also be set.

Forensic testing of biological samples for DUI cases is the responsibility of the National Department of Health Forensic Chemistry Laboratories (FCL). Unfortunately, these laboratories are already beyond capacity with a much-publicised backlog and may lack the capability to render additional adequate forensic toxicology/analytical services.<sup>67</sup> Additionally, not all FCLs are accredited by the South African National Accreditation System, which aims to ensure formal recognition and competence in line with international standards based on the relevant ISO 17025 requirements.<sup>68</sup> Suboptimal storage conditions and delays in analyses of samples may also compromise the validity of test results and their use in courts of law.<sup>69</sup>

## **Recommendations for reform in South Africa**

Very few cases of drug driving, outside of that of alcohol intoxication, are identified or pursued under current legislation and law enforcement strategies. There is no specific legislation that prescribes limitations pertaining to driving whilst under the influence of a drug other than a narcotic substance, but which may nonetheless impair driving ability. The NRTA also makes no provision for determining the presence of drugs,

nor the medical evidence required to prove positive detection and impairment. In order to prevent drugged driving, as well as successfully identify and prosecute individuals who do so in South Africa, important revisions to existing legislation and detection strategies are required. Although it will be the responsibility of the state law advisers to draft this legislation, input and guidance should be sought from appropriate medical and/or scientific experts, particularly from forensic toxicologists, which is currently a growing discipline in South Africa.

Currently, the NRTA does not provide a definition for the term ‘narcotic’ in the list of definitions of the Act.<sup>70</sup> No specific provision is made to define or to prevent driving whilst under the influence of other substances (medicinal or non-medicinal, licit or illicit) which may predispose the driver to dangerous situations or have a detrimental effect on the overall ability to safely operate a vehicle on the roads. Included here would be a variety of non-narcotic substances that may compromise the cognitive functioning (including, for example, by inducing recklessness and/or risk taking) or impair the sensory and motor capacity required to negotiate traffic situations. The NRTA also needs to include comprehensive and inclusive statutory restrictions and limitations applicable to driving while using impairing non-alcohol substances, based on medical, pharmacological and legal guidance. The Act should also include an adequate legal definition for the term ‘drug.’

Cases of drugged driving must be more successfully identified and processed by law enforcement, as the failure to do so can have devastating effects. The case of *S v Katlego M Maarohanye* and co-accused Themba Tshabalala provides an example of this impact. The accused were found guilty of driving under the influence of cocaine, causing an accident that killed four school children.<sup>71</sup>

Although per se legislation makes prosecuting drugged drivers more efficient and effective, the vast number of potentially impairing drugs and the numerous combinations and interactions between them makes it difficult to set limits (like the 0.05 g/100 mL BAC limit for alcohol) for all drugs of abuse.<sup>72</sup> Implementing non-zero thresholds may also lead to a public perception that driving under the influence of illegal drugs is acceptable to a certain degree. To enable the proper implementation of per se standards, the public must be made aware of the risks and consequences of impairment, especially when driving while under the influence of prescription drugs. This public awareness campaign must also include adequate information and precautions, for example, through appropriate drug labelling, and physician and/or pharmacist counselling.<sup>73</sup>

More efficient and accurate drug testing could also lead to improvements in the detection, prosecution and conviction of drugged drivers.<sup>74</sup> To enable this, standards should be set for the biological matrices authorised for drug analysis, specification of the substances that should be tested for during analysis, cut off concentrations should be established for different substances, and the circumstances under which drug testing should be conducted should be clarified. Standard operating procedures need to be defined for the acquisition, storage, quality control and analysis of specimens. To ensure successful prosecution of drugged drivers, it is vital that these analyses be conducted at an accredited facility, by fully trained forensic analysts.

Clear protocols – similar to those already in place for alcohol – must be established for police to follow when testing and obtaining specimens from drivers who are under the influence of drugs. Drugged driving detection and enforcement should be aligned with procedures developed for alcohol impaired

driving. This could be accompanied by roadside clinical assessment programmes or providing officers with training on identifying drug impairment symptoms in drivers, as is practiced by Drug Recognition Experts (DREs) in certain parts of the US.<sup>75</sup>

Forensic mortuaries should also implement a prescriptive protocol for the routine testing of biological samples obtained at autopsy from fatally injured drivers for the presence of substances other than just alcohol.<sup>76</sup> This protocol should use a ‘targeted’ approach to identify those substances which may commonly be abused in a particular society. Along with regular random roadside testing, this could provide valuable insight into the prevalence and demographics of drug use by drivers in the general population. This information could foundation prevention strategies, as well as align with resolutions addressed in the 2013–2017 National Drug Master Plan (NDMP).<sup>77</sup> The additional costs incurred by such extended testing programmes may be justified by the benefits that may accrue from an improved understanding of the scope and nature of the problem of drug abuse in South Africa, as well as the improved administration of justice.

Expert medical evidence is very seldom led by prosecutors in cases of alleged drug driving in South Africa: physicians at emergency medical facilities rarely do formal assessments of injured patients with respect to possible drug and/or alcohol induced impaired driving ability – and even less frequently formally and properly document these findings contemporaneously in patient records.<sup>78</sup> Physicians and nurses should be trained and mandated to do the clinical (and laboratory) assessments required to recognise, identify and chart the effects of drugs and alcohol. Additional training should be done to ensure that medical staff are aware of their ethical and legal obligations in these cases, and are familiar with the provisions of the Criminal Procedure Act 51 of 1977.



## Conclusion

At present, our knowledge of the extent of drugged driving in South Africa is very limited. More studies should be conducted in South Africa to adequately define the problem and to provide accurate data to underpin policy initiatives and resource allocation. Additionally, operational protocols to identify drugged drivers need to be defined, encompassing aspects that extend from the roadside to the clinical or mortuary setting and the analytical environment. These protocols should be based on principles of cost effectiveness (in a resource constrained society) as well as scientifically robust methodologies, in order to withstand inevitable intense scrutiny in our adversarial legal system. Field sobriety testing and oral fluid screening, using state of the art devices, should be considered for routine (screen) detecting of drugged driving at the roadside and in emergency rooms. Specific and appropriate clinical assessments by trained medical and nursing professionals should be routinely performed on injured drivers – and the results should be competently and contemporaneously recorded. Provisions also need to be made to include standardized protocols for obtaining blood samples for confirmatory analyses and associated laboratory methodologies that would serve admissible in court. It is then vital to enhance laboratory capacities for toxicological testing and designate appropriate facilities to efficiently render these analytical services.

Existing legislation must be revised, guided by appropriate scientific expertise. The adoption of per se laws pertaining to drugged driving may be in the best interest of public safety. Legislation that requires routine drug testing for certain drugs (other than alcohol) and defines the analytical parameters and required evidence for prosecution may deter drugged driving and enhance the successful prosecution of drug impaired drivers. These efforts should target

known, problematic and/or commonly abused substances in South Africa as a starting point.

Interventions such as regular random roadside testing and mandatory testing of drivers involved in accidents are necessary to establish the extent and profile of drug and alcohol impaired driving in South Africa. An integrated approach of support and collaboration is necessary between relevant participating role players (law enforcement agencies, health care workers and medical professionals, forensic scientists as well as prosecutorial authorities) in order to revise existing legislation and develop a standardised and realistic protocol-driven approach to reduce drug impaired driving in South Africa.

These proposed measures would undoubtedly have substantial additional cost implications. However, these costs (of setting up working committees, revised training of law enforcement officers, health care workers and prosecuting authorities, as well as increased analytical costs), must be weighed against the benefits to society, and the economic and social burden of drugged driving-related road traffic injuries in South Africa. Perhaps the right question is not whether the country can afford such an increased fiscal burden, but whether we can afford not to?



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## Notes

Jade Liebenberg: <https://orcid.org/0000-0002-6503-6333>  
Lorraine du Toit-Prinsloo: <https://orcid.org/0000-0003-1974-9313>  
Gert Saayman: <https://orcid.org/0000-0002-1485-0749>  
Vanessa Steenkamp: <https://orcid.org/0000-0003-3575-0410>

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