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Smoke on the water—Oral fluid analysis at sea

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ABSTRACT

This study outlines the operational challenges and findings of an illicit drug oral fluid testing program carried out on the skippers (those in charge) of water vessels in Queensland, Australia. Between 2010 and 2016, 953 tests of skippers were conducted on water (waterside) for three proscribed illicit drugs; delta-9-tetrahydrocannabinol (THC), methylamphetamine (MA) and 3,4-methylendioxymethylamphetamine (MDMA). 126 (13%) of the skippers tested returned an on-site positive during waterside testing, 125 were confirmed positive for one or more illicit drug by subsequent laboratory analysis, whilst one skipper did not provide an oral fluid sample for confirmatory analysis. The skippers were entirely male (100%) with an average age of 39 years (range 17–59). THC was by far the most common drug detected (91%); MA was detected in 22% of skippers and a combination or THC and MA in 14% of specimens. MDMA was identified only once during the study, this being in combination with THC. As a single waterside operation can take more than a week, operational pre-planning becomes essential. Aspects of the operation such as, weather, shift times, food, testing consumables, sleeping quarters, hygiene, liaison between different agencies and multiple other factors need to be taken into account prior to commencement. A waterside operation must be mobile and, in Queensland at least, able to cover a large area of water. There is also a much lower volume of vessels likely to be encountered at sea compared to a roadside operation targeting motor vehicles.

1. Introduction

Oral fluid has become a commonly utilised matrix for roadside drug testing of drivers. There are many literature reports available regarding the successful implementation of roadside oral fluid drug testing programmes in various Australian states [1–4] and in other countries throughout the world [5–7]. One of the major benefits of oral fluid analysis compared to other bodily fluids (e.g. blood, urine) is that its collection is non-invasive in nature. Non-medical personnel can therefore complete it in a timely manner that does not unduly delay the driver or the operator. The oral fluid of drivers can also be initially "screened" at the roadside for drugs of interest using one or more on-site detection devices. The oral fluid of drivers who return an on-site positive at the roadside can then be collected and sent for confirmatory laboratory analysis.

Queensland is the second largest state in Australia located in the northeastern part of the country. A map of Queensland, also indicating the division of state police districts, is shown in Fig. 1 below. The state covers an area of 1,727,000 km^2 [8], equivalent to approximately seven times the size of the United Kingdom and has a population of over 4.8 million [9]. Queensland legislation differentiates two types of driving offences with respect to drugs, the most serious is 'driving under the influence of liquor or a drug' and the other is 'driving whilst a relevant drug is present in blood or saliva'. If police observe indicia consistent with impairment, they have the authority to arrest for the serious offence of 'driving under the influence of liquor or a drug' and obtain a blood sample, which is analysed by the laboratory and used as corroborating evidence to the indicia observed. Conversely, a driver who is found to have one or more relevant drugs present in their system can be charged with the offence of 'driving while a relevant drug is present in your blood or saliva'. The penalties incurred for a first offence driver is a fine and loss of vehicle license for 1–3 months, or imprisonment of up to 3 months. The Queensland roadside oral fluid testing program began in 2007 and allowed for the analysis of three proscribed (relevant) illicit drugs; delta-9-tetrahydrocannabinol (THC), methylamphetamine (MA) and 3,4-methylendioxymethylamphetamine (MDMA). The results of the oral fluid program in relation to motor vehicle drivers have been reported elsewhere [3].

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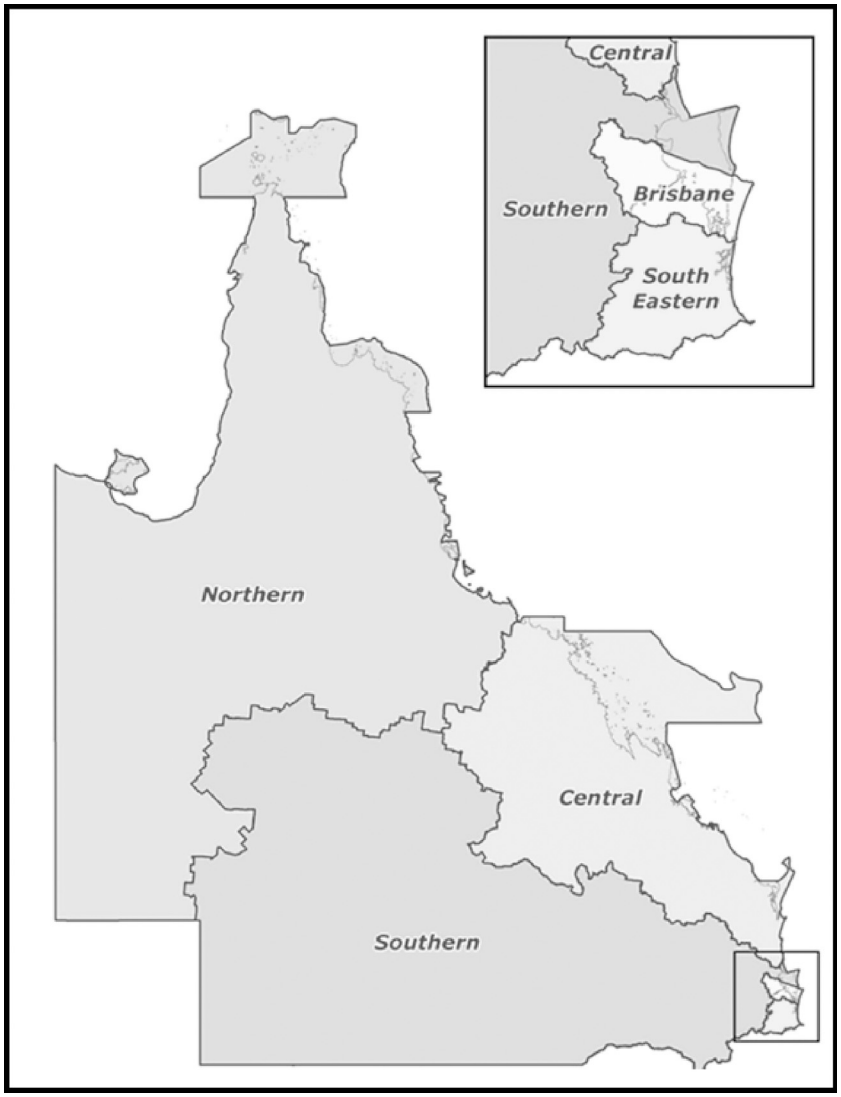

Fig. 1. Map of Queensland showing police districts.

A little known aspect of the Queensland legislation is that the term driver is not restricted to drivers of motor vehicles, but also relates to the drivers or 'skippers' (those in charge) of boats or vessels on the waterways of Queensland. Drug use amongst seafarers has long been regarded as a potential occupational health risk, though many of the published studies do not distinguish between seamen/workers and the skippers in charge of vessels. Early reports generally focused on the consumption of legal drugs; tobacco and alcohol were observed to be commonly consumed by seamen [10–13]. Cannabis has been shown to be the most commonly abused illicit drug amongst seamen [13,14]. In an epidemiological survey of French seamen, 16% indicated the use of cannabis in the past 30 days compared to a rate of 1.2% for all other illicit drug types, which included amphetamines, cocaine, lysergic acid diethylamide (LSD), heroin, magic mushrooms (psilocybin), poppers (amyl nitrate) and sniffing (volatiles) [15].

A survey of Western Australian fishing industry workers found a high level of reported drug use [16]. This study made a distinction between the reported drug use of the workers whilst at sea or whilst in port during the last six months. Alcohol and cannabis were the most commonly used drugs overall and a large number of workers (56% and 40.5% respectively) reported their use whilst at sea. Many other drugs such as amphetamines, heroin, cocaine, LSD, ecstasy and ketamine were reported to be used, though generally were much more frequently used when in port rather than at sea. Amphetamines were reported to be used by 20.7% of workers whilst in port but only 1.7% used these drugs at sea [16]. A survey of 66 trawler crew workers in North Queensland showed a high level of injecting drug use (47% of respondents) with amphetamine and heroin being the most commonly injected drugs. The survey did not expand on whether the injectable drug use occurred whilst at sea or in port, however, 21% of workers who reported injecting drug use also reported at least daily use of an injectable drug over the previous month [17].

The Queensland Police Service (QPS) instigated a testing program for water vessel skippers in 2010 and several operations have been conducted on the water since this time. This paper outlines the results of this program and the operational challenges that are evident when conducting this testing at sea.

2. Materials and methods

The testing procedures and protocols used by police at sea were the same as those employed for all oral fluid testing of vehicle drivers. Skippers intercepted by police were initially subjected to a breath analysis test for alcohol. Those skippers who returned a