

Expert Panel on Drug Driving – approved minutes of 18th September 2012 meeting, 12:30 – 16:45

Venue: Department for Transport

Attendees:

Dr. Kim Wolff, Chair (King's College London)
Professor Robert Forrest (Sheffield University)
Professor Atholl Johnston (Barts & London School of Medicine, Queen Mary University)
Professor David Osselton (Bournemouth University)
Professor David Taylor (South London and Maudsley NHS Foundation Trust)

Xxxxxx Xxxxxxx (Centre of Applied Science & Technology)
Xxxxx Xxxxxxx (DfT)
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Xxxxxxx Xxxxx (DfT)
Xxxxxxx Xxxxxxx
Mark Prunty (DoH) - Observer

Apologies:

Honorary Professor Eilish Gilvarry (Newcastle University)
Dr. Lily Read (Northampton Healthcare NHS Trust)
Dr. J. Colin Forfar (CHM representative)
Dr. Judith Morgan (DVLA)
Dr. Roger Brimblecombe (ACMD representative)
Xxxxxxx Xxxxxxx (DfT)

1. AOB

There were no items raised under AOB.

2. Minutes from the previous meetings and matters arising

Xxxxxxx Xxxxx Xxxxx and Xxxxxxx xxxxxxxxx introduced themselves to the panel. Xxxxxxx Xxxxx joins the Panel to provide pharmacological advice on prescribed medications and Xxxxxxx Xxxxxxx is the policy official with responsibility for the legislation taking over from Xxxxx Xxxxx.

Agreed: The draft minutes of the meetings of 23rd July 2012 and 21st August, along with the notes of the two teleconferences on 21st August with Xxxx Xxxxx and Xxxx Xxxxxxx.

The note of the meeting with Xxxxxxx Xxxxxxx on 10th September was also circulated to the panel.

3. Epidemiological Evidence

At the last panel meeting a TRL draft report presenting an analysis of drugs present in road traffic fatalities¹ had been considered and an update of table 11 was presented showing drugs present in biological fluids of 'driver-only' fatalities. The table showed 231 driver fatalities overall where drug data was available, 46 (or 20%) of whom had used 'illicit drugs' and 72 (or 31%) had consumed 'prescribed medication' (n.b. morphine, codeine and are included in this category) and recreational drugs such as ketamine. In 132 of the driver fatalities (or 57% of the survey) no drugs were detected. Only 1 driver had tested positive for new psychoactive substances.

Xxxxxx Xxxxxxx presented data from laboratory screening tests of drug drive samples from January 2012 to the present day, from cases where there had been a road traffic accident or the police had witnessed driver impairment and where confirmatory tests had found presence of drugs. Xxxxxx explained that the screening data gave a better picture of the prevalence of drugs as confirmatory tests only tested for one or two of the drugs found in the screening test.

It was noted that data from only 1 forensic laboratory had been provided so far, which had however analysed samples from every police force (except City of London).

It was further noted that work is on-going to extract and combine a complete data set from other forensic providers. The data were from screening samples only so will include some false positive (and false negative) results. 1,161 blood samples screened positive for at least one substance, and in total [2,222 individual drug compounds] were found in those samples. The analysis of these positive samples was set out in more detail.

The panel observed that there was a 50/50 split between single substance and polysubstance use. Cannabinoids were present in 31% of samples and benzodiazepines in 27 %.

For other illicit drugs: 14% of samples contained a cocaine metabolite,
11% an opiate, and
10% amphetamine.

An additional 133 samples had been analysed for both drugs and alcohol, with half containing alcohol and 1 other substance (benzodiazepines and cannabinoids being most frequent). It was noted that benzodiazepines and/or cannabinoids were present in 87% of drug positive screening samples, and that only 13% of samples did not contain either of them. Benzodiazepines and/or cannabinoids were also present in 79% of drug and alcohol positive screening samples.

¹ Transport Research Laboratory, L Smith and J Martin, DRAFT PROJECT REPORT RPN2242, Alcohol and drugs in road fatalities - 2012 report based on 2010 data

Action: Xxxxxx Xxxxxx to provide blood concentration data from the confirmatory tests of the samples, and further figures for drug and alcohol use by drug type.

Xxxxxxxx Xxxxx Xxxxxxxx presented some data from whole blood samples analysed by The Forensic Science Service over a three year period (from 2004-2007), where drivers had been suspected to have been driving whilst impaired following drug use. The overall spread of data was similar to the LGC data, but results for methadone use were low. Cannabinoids were also excluded from the data, as THC could not be detected in 2007.

4. Scientific literature and evidence for specific drugs:

a) Z Drugs and SSRIs

Xxxxxxxx Xxxxx Xxxxxxx presented papers on Z drugs and SSRIs (Selective serotonin reuptake inhibitors). It was reported from the scientific literature that Zaleplon has not been linked to an increased risk of an RTA (though it is used less than zopiclone and zolpidem, so epidemiological data is limited). There is some evidence that combining a Z drug with alcohol could also pose an increased risk.

SSRIs would affect the metabolism of other drugs, but were not mentioned in the Misuse of Drugs Act 1971. SSRIs do not adversely affect cognitive performance, but have been linked to an increased risk of an RTA (with depression itself possibly being a factor). Tricyclic antidepressants were strongly or mildly sedative, with some evidence of next day impairment and increased risk of an RTA.

b) Cannabis

The panel referred to the debate in July's meeting² on setting levels for Cannabis and alcohol. Based on the odds of having an accident at a specific THC concentration the panel considered the evidence for the combined use of alcohol and cannabis and recommended a threshold in blood of 3 mg/L when the blood alcohol content was >20mg/100ml was also proposed. The panel revisited the Dutch advisory committee's overview of odds ratio with relation to Cannabis and THC.

c) Cocaine

The panel discussed whether to set a threshold for cocaine alone and whether in addition, there should be a threshold for benzoylecgonine (BZE).

² This followed on from the presentation about alcohol, cannabis and driving at the July panel meeting drawing on a French paper about responsibility for fatal accidents while driving under the influence of cannabis in France between October 2001 and September 2003, Laumon B., Gadegbeku B., Martin J.L. and M.B. Biecheler, Cannabis intoxication and fatal road crashes in France: population based case-control study, BMJ 331, 1371, 2005.

The Panel considered evidence from Jones et al, 2008 presented in Xxxx Xxxxxx paper, that looked at different concentrations for driving under the influence of cocaine and BZE and noted:

Cocaine mean (median) and highest conc	0.095 (0.07) and 0.5mg/L
BZE mean (median) and highest conc	1.01 (0.70) and 3.1mg/L
Cocaine & BZE together mean (median) conc	0.076 mg/L (0.05mg/L) 0.859 mg/L (0.70mg/L)

It was also noted that when Cocaine & BZE were detected together (mean cocaine concentration 0.836 mg/L) the concentration of BZE was significantly higher (mean 0.669 mg/L) compared to cases with a single detection of BE (mean 0.209 mg/L) ($p=0.001$).

It was agreed by the panel that the simultaneous detection of both substances is indicative of consumption shortly before the blood sampling whereas sole detection of BZE is indicative of consumption some time ago. It was also noted that cocaine is a very fast acting drug and a threshold for cocaine alone could miss a lot of cases of cocaine use where a driver was still under the influence of the drug. The panel considered a potential limit of 0.08 mg/L for cocaine in line with evidence in the literature.

Consideration was also given to BZE. BZE is the usual objective biomarker for cocaine use and is detected routinely in clinical and forensic laboratories. It was noted that there is less evidence with regard to BZE and risk of RTA.

Action: Clockwork Research to review literature available giving odds ratios for the risk of a RTA following ingestion of cocaine for both cocaine and BZE.

An attempt would be made to estimate how many drivers under the influence of cocaine would be missed by new legislation, if a limit was set only for cocaine, and no limit for BZE.

d) LSD and Ketamine

It was agreed that the use of LSD was not compatible with driving due to its strong psychomotor, cognitive and residual effects. The panel noted that little scientific evidence was available on driving or RTA risk and LSD. LSD has no legitimate medical use, so a minimum level of detection could be recommended for LSD use when driving.

It was also agreed that use of Ketamine, a drug used to bring about anaesthesia was not compatible with driving. The panel noted that in recreational settings ketamine has stimulant effects and is often used in low doses. However, frequent use and higher doses induces dissociative, analgesic and psychedelic effects. Ketamine use is prevalent as a recreational drug.

A case study had been undertaken in Hong Kong to establish signs of impairment from ketamine use but this had recorded oral fluid and urine (rather than blood) concentrations.³

The panel noted that manufacturers' advice stated that driving should not be undertaken for 24 hours or more after taking this drug.

e) Opioids and Opiates

Epidemiological studies have shown that use of opioids can lead to an increase in the risk of road traffic accidents. The panel noted a UK study in 2006 that analysed biological samples from drivers apprehended under suspicion of impaired driving, which found opioid drugs most commonly detected after benzodiazepines, including morphine (heroin) and methadone.

The panel noted that several different terms were used with regard to the opioids in the literature including 'illicit opiates, opioids, medicinal opioids and opiates.

It was agreed that recommendations to the Secretary of State should reflect those drugs listed in the Misuse of Drugs Act. It was noted that the term 'opiate' would reflect derivatives of the poppy plant (heroin, morphine, codeine etc).

It was also noted that the panel would consider the evidence for the opioid drugs methadone and buprenorphine separately, and also consider other medicinal opioids as listed in the Misuse of Drugs Act and make recommendations based on the evidence in the scientific literature.

A short paper from the Home Office on the approach used for testing on arrest was considered. It was noted that confirmatory tests included morphine, codeine, dihydrocodeine and 6-mono acetylmorphine.

The panel discussed whether it was appropriate to specify a single limit for all opiate drugs as had been the practice in other areas of Europe (See paper on drug driving law in the EU, considered at the panel meeting of 23 July) or specify a limit for each individual drug. It was noted that other countries had set a blanket limit for all non-medicinal opiates.

The panel previously considered the recommendations leading to the new legal limits for drug driving in Norway. The concentration limit for morphine in the new law (in place since 1 February 2012) in Norway is as follows:

³ Wing-Chi Cheng, Kin-Man Ng, Ka-Keung Chan, Vincent King-Kuen Mok, Ben Kin-Leung Cheung, Roadside detection of impairment under the influence of ketamine — Evaluation of ketamine impairment symptoms with reference to its concentration in oral fluid and urine, *Forensic Science International* 170 (2007) 51–58.

Drugs	Impairment limits (ng/ml in whole blood)	Limits for graded sanctions comparable to blood alcohol 0.05 % (ng/ml in whole blood)	Limits for graded sanctions comparable to blood alcohol 0.12 % (ng/ml in whole blood)
Morphine	9	24	61

The panel also considered the report by the Dutch advisory committee (March 2010) to inform potential new legal limits. It considered specifically the report's conclusions about the active plasma and blood concentrations of morphine known to be a hazard when driving and the median detected in blood for suspected drug drivers (measured by the Netherlands Forensic Institute 1999-2008).⁴

Substance	Expected concentration in plasma after taking an active dose ^a (micrograms/L)	Blood/serum ratio ^b	Estimated concentration in blood after taking an active dose ^c (micrograms/L)	Median in blood NFI 1999-2008 (micrograms/L)
Morphine	10-120	1.0	10-120	40

It was noted that the committee had recommended thresholds above the normal therapeutic range. This would help distinguish between those using opiates for medicinal purposes and those using the drug for its psychoactive euphoric effects. The Panel looked at the report's odds ratio summary tables and noted that odds ratios were not uniform across opiates.

Opiates	OR: 2.35 (95% CI: 0.87-6.32)	4
-morphine	OR: 1.41 (95% CI: 0.7-2.9)	5
-morphine < 20 micrograms/l	OR: 32	6
	OR: 8.2 (95% CI: 2.5-27.3)	7

It was noted that the OR of death or serious injury in RTAs for illicit opiates has been reported to be between 2.47 and 10.04 and provides evidence of the increased risk for drivers.⁵

The panel considered the data provided by Xxxx Xxxxxxx. This included blood concentrations of drugs submitted for analysis to DUID laboratory of the Forensic Science Service (FSS) from drivers suspected to have been driving

⁴ Netherlands Advisory Committee, Recommendation with respect to limits for drugs in the context of the proposed amendment to the Road Traffic Act 1994 (March 2010)

⁵ Bernhoft, I.M., Results from epidemiological research - prevalence, risk and characteristics of impaired drivers, DRUID Project deliverable, 2011.

while impaired. This data was compared to therapeutic and toxic ranges (Uges 2011, in Moffat, Osselton and Widdop).

The data for morphine is presented below:

Substance	No samples analysed	Range (ug/mL)	Mean (ug/mL)	Median (ug/mL)	Ther range (ug/mL)	Toxic range (ug/mL)
Total Morphine	394	0.083 – 2.94	0.663	0.358	0.01-0.12	>0.15

The panel considered the comparison of cut-offs and proposed limits for driving under the influence of drugs applied across Europe prepared by Clockwork Research. For morphine several countries were using thresholds of 10 ug/mL (Belgium, Denmark, Germany, Greece, Italy). In France, Netherlands, Poland the threshold for morphine was 20ug/mL.

The Panel also noted that in Norway the legal morphine limit reported to be equivalent to 0.5g/L ethanol was 24 ug/mL. In France, the threshold was set at 20 ug/mL. A French case control study compared prevalence of drugs in 900 injured drivers and controls and reported an OR 8.2 of RTA when morphine was detected > 20 ug/mL.⁶

A potential limit for morphine was discussed and the Panel considered a threshold of 40 ug/L based on the available evidence.

The panel agreed to discuss methadone and buprenorphine separately and to consider the evidence for codeine, tramadol and dihydrocodeine at a future meeting.

Action: Xxx Xxxx to provide a paper on methadone and buprenorphine.

f) Other Drugs

Amphetamine-type drugs

Finally, the summary of odds ratio information by Clockwork Research in relation to amphetamine was considered. It was noted that the odds ratios related to road traffic accidents when driving following amphetamine use were higher than for cannabis.

⁶ Mura P., Kintz P., Ludes B., Gaulier J.M., Marquet P., Martin-Dupont S., Vincent F., Kaddour A., Goullé J.P., Nouveau J., Moulsmas M., Tilhet-Coartet S. and O. Pourrat (2003) Comparison of the prevalence of alcohol, cannabis and other drugs between 900 injured drivers and 900 control subjects: results of a French collaborative study. *Forensic Science International* 23;133(1-2):79-85.

Substance	OR	95% CIs	Basis of the OR	Refs
Amphetamine	4.46 (p<0.05)	2.21 - 9.00	Meta analysis of 8 studies analysing presence of amphetamines in drivers fatally injured in road crashes	9
Amphetamine	8.88 (p<0.001)	4.54 - 17.39	Case control study (Thailand) comparing urine samples from 200 cases after road accidents with 849 controls.	16
Amphetamine	8.35	3.91 - 17.83	Analysis of blood samples collected from individuals seriously injured in road accidents in 6 European countries between 2007-2009.	4
Amphetamine	24.09	9.72 - 59.71	Analysis of blood samples collected from individuals killed in RTAs in 4 European countries between 2007-2009.	4
Amphetamine	2.1	0.66 - 6.73	Case-control study Netherlands comparing 110 drivers hospitalised after a road accident with 816 drivers randomly selected from moving traffic.	13
All stimulants including cocaine	2.27	0.9 - 5.6	Case-control study of 3398 fatally-injured drivers in Australia to assess the effect of alcohol and drug use on the likelihood of them being culpable.	8

Action: Xxxxxxxx Xxxxxxxx to prepare a paper on amphetamines

Xxx Xxxxx to prepare a paper on what limits the panel had proposed for certain drugs.

The panel noted that steroids had not been discussed and that consideration would be given at a future meeting.

It was also noted that Xxxxxxxx Xxxxxxxx had suggested that the effects of Antihistamines should be part of the panel's deliberations.

Xxx Xxxxx also agreed to check whether diazepam was on the list of controlled drugs contained in the Misuse of Drugs Act 1971.

5. Policy update

The panel was advised that the Crime and Courts Bill would be back for debate in the Lord's in early November, with the drug driving provisions likely to be debated on 12th November. Xxx Xxxxx had been invited to brief Peers on what was likely to be in the Panel's interim report on 24th October at the Home Office.

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DfT would be responding to the FOI request about the panel's work shortly.