Driving under the Influence of an Intoxicant in Ireland

K.J. Flynn, G Harrington, P. Furney, C.P. Leavy and D.A. Cusack,
Medical Bureau of Road Safety, Department of Forensic Medicine, University College Dublin

Introduction

The Road Traffic Act 1994 prohibits driving under the influence of an intoxicant. The Act defines an intoxicant as including alcohol and drugs and any combination of drugs or of drugs and alcohol. The permitted legal limit for alcohol was set at 80 mg/100ml in blood, 107mg/100ml in urine, and 35µg/100ml in breath.

Under the Act, the Medical Bureau of Road Safety (MBKS) is responsible for:

- the receipt and analysis of specimens of blood and urine for the concentration of alcohol and for the presence (if any) of a drug or drugs;
- the provision of equipment for the taking of such specimens;
- approval, supply and testing of apparatus for indicating the presence of alcohol in the breath;
- approval, supply and testing of apparatus for determining the concentration of alcohol in the breath.

The number of specimens analysed by the MBRS has been increasing for both alcohol and drugs.

Table 1
Specimen numbers for alcohol and drug analysis by the MBRS

Year	Specimen type	Alcohol analysis	Drug analysis
1995	blood and urine	4,766	8
1996	blood and urine	5,514	16
1997	blood and urine	6,591	24
1998	blood and urine	7,812	32
1999	blood and urine	8,476	50
2000	blood, urine and breath	10,134	78

Analysis of Specimens

The blood and urine specimens were analysed for the concentration of alcohol using Headspace Gas Chromatography. The breath specimens were analysed for alcohol concentration using either infra red spectroscopy (lion intoxilyzer 6000 IRL) or fuel cell technology (INTOXIMETER EC/IR). The blood and urine specimens were analysed for the presence of a drug or drugs using an ELISA system (COZART). The MBRS used the following microplate enzyme immunoassay kits:

Table 2
Cozart kits used by the MBRS to analyse for the presence of a drug of drugs in blood and urine specimens

Kit	Analyte
Amphetamine	Amphetamine
	Methylene-dioxyamphetamine (MDA)
Methamphetamine	Methylene-dioxymethamphetamine (MDMA)
Benzodiazepine	Diazepam
	Flunitrazepam,
	Flurazepam, Nitrazepam,
	Nordiazepam,
	Temazepam
Cannabinoids	11-nor-delta-9-carboxy-tetrahydro-cannabinol
Cocaine	Cocaine,
	Benzolyecgonine,
	Ecgonine methyl ester
Opiates	Codeine,
	Dihydrocodeine,
	Morphine, 6 Monoacetylmorphine (MAM)
Methadone	Methadone, 2-Ethylidene-1, 5-dimethyl--3,3-diphenylpyrrolidine (EDDP)

Specimens testing positive were forwarded to the State Laboratory for confirmatory analysis by either GC/MS or LC/MS. Confirmation was sought for all drugs and drug classes detected by the MBRS. Blood specimens were collected in 7-ml glass bijou bottles containing minimum 2 per cent sodium fluoride as preservative and I per cent potassium oxalate as anti-coagulant. Urine specimens were collected in 2tSmi glass bottles containing minimum 1.5 per cent sodium fluoride as preservative. Not all blood specimens were of 7 ml volume nor urine specimens of 28 ml volume.

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All specimens were analysed on receipt or the following day for alcohol concentration and stored at 4ºC for at least three months. The length of time between date of provision of specimen and date of drug tests in the MBRS varied; the minimum time was 11 days and the maximum time was 106 days, which was due to a delay in the drug request. Final results of analysis were required within six months of the date on which the specimen was provided for prosecution purposes.

Alcohol Results

In 2000, 93 per cent of blood specimens, 91 per cent of urine specimens and 82 per cent of breath specimens were over the limit. In the same year, 57 per cent of blood specimens, 66 per cent of urine specimens and 33 per cent of breath specimens were over twice the limit.

Table 3
Certified alcohol content of blood specimens

LEVELS mg/100ml	NUMBERS	PERCENTAGE %
0-80	269	6.8
81-100	173	4.4
101-150	757	19.2
151-200	1,143	28.9
200	1,610	40.7

Table 4
Certified alcohol content of breath specimens

LEVELS µg/100ml	NUMBERS	PERCENTAGE %
0-35	548	17.8
36-44	278	9.1
45-66	1.022	33.2
67-88	861	28.0
>88	366	11.9

Table 5
Certified alcohol content of breath specimens

LEVELS µg/100ml	NUMBERS	PERCENTAGE %
0-107	226	8.8
108-135	154	6,0
136-200	578	22.6
201-267	838	32.8
>267	763	29.8

Drug Results

Of the 78 specimens tested for the presence of a drug or drugs, 37 were blood specimens and 41 urine specimens. Of these, 34 blood specimens and 37 urine specimens were found to be positive, while seven specimens were negative for the drug or drug classes tested (three blood and four urine specimens). There were 23 specimens found positive for one drug class and 48 for more than one drug.

Table 6
Drugs found using Cozart immunoassay screening tests

	specimens		cut-off values mg/ml	
	blood	urine		
amphetamine	11	21	50 (B)	300 (U)
methamphetamine	13	11	50 (B)	300 (U)
benzo-diazepine	14	22	100 (B)	100 (U)
cannabinoids	22	31	20 (B)	20 (U)
cocaine	1	5	100 (B)	100 (U)
opiates	5	22	100 (B)	100 (U)
Methadone	6	12	25 (B)	25 (U)

Table 7
Drugs found in blood and urine specimens using Cozart Immunoassay screening tests

	percentage of total
Cannabinoid	32%
Benzodiazepines	19%
Methamphetamine	18%
Amphetamine	15%
Methadone	8%
Opiates	7%
Cocaine	1%

The bureau forwarded 71 specimens to the State Laboratory for confirmation of results before final issuing of reports for prosecution purposes.

The data indicated frequent polydrug use: 66 per cent of the confirmed specimens contained two or more drugs, and 10 per cent of the specimens were confirmed with four or more drugs present. Cannabis, amphetamines and benzodiazepines were the most frequent drug groups found. Cocaine was the least common drug found.

In total, 79 per cent of the drug request specimens in 2000 were found positive for the presence of a drug or drugs, 15 per cent were unconfirmed and 6 per cent were found insufficient for analysis.

Combining the drug results with the alcohol results for the same specimens, 47 were under the limit for

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Figure 1
State Laboratory confirmatory blood results

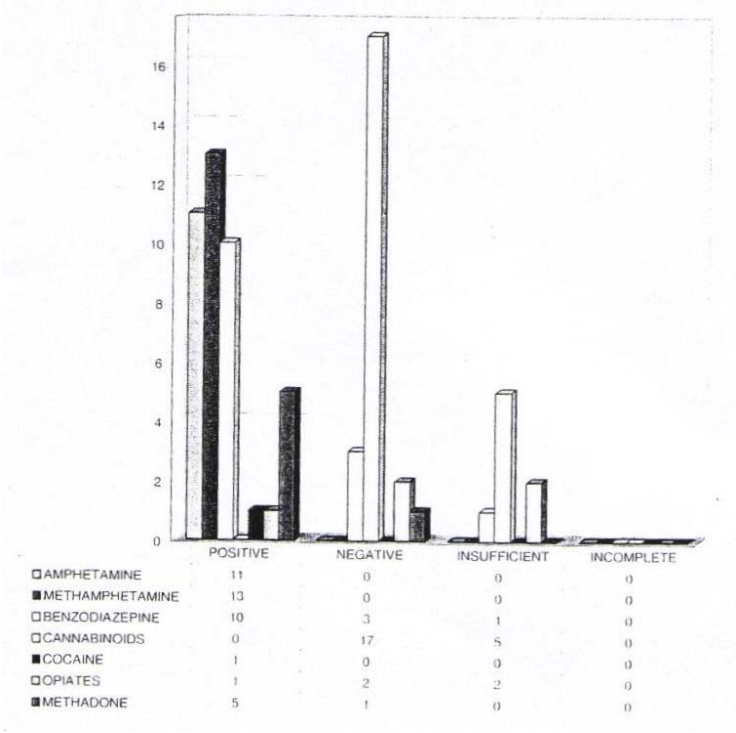

Figure 2
State Laboratory confirmatory urine results

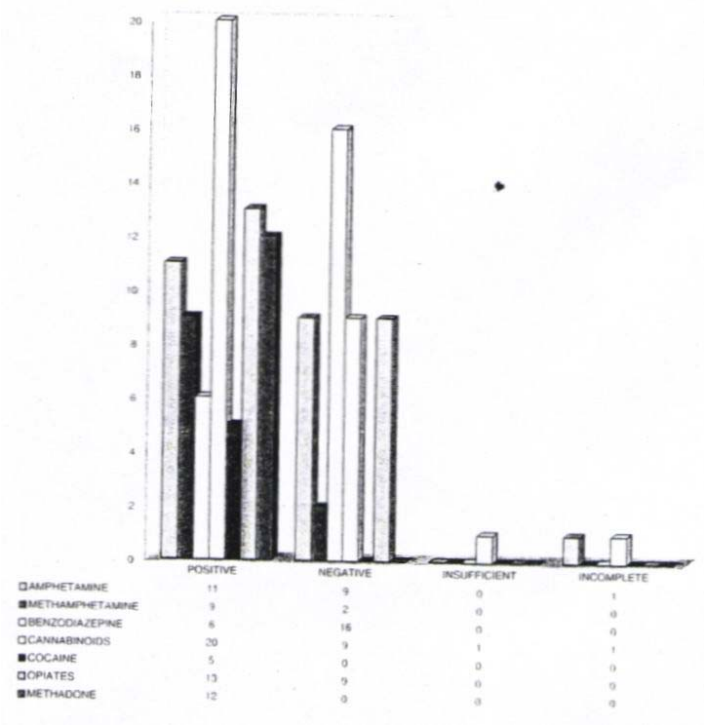

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Figure 3
Frequency of polydrug use in positive specimens

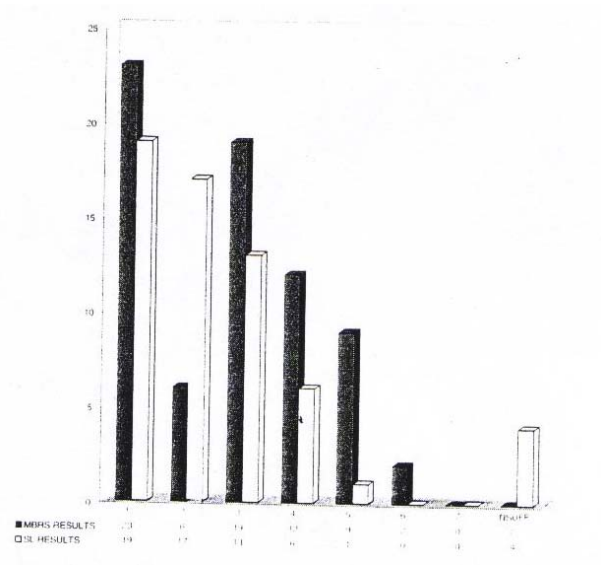
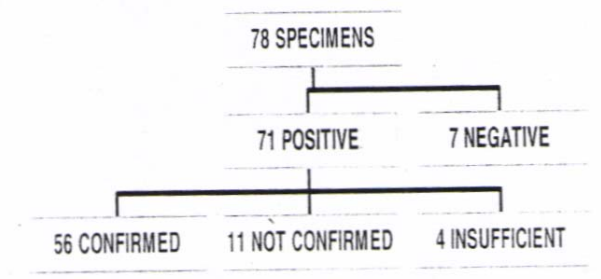


Figure 4
Drug analysis of Road Traffic Act Specimens



alcohol and contained drugs, nine were over the limit for alcohol and contained drugs, and only two were found to be negative for alcohol and drugs.

Conclusions

The number of requests for the presence of drugs in RTA blood and urine specimens is increasing annually and the high percentage of positives found in the specimens tested indicates the need for such analyses.

The results showed excellent agreement for drug detection in the blood specimens analysed by the different methods, except for the cannabinoids. The lack of confirmation of the presence of cannabinoids in the blood specimens will need special attention. The results from the urine tests gave mixed agreement. Specimen stability, cross reactivity and choice of cut-off values may have contributed to the disparity in the results. As the driver is permitted under the Road Traffic Act to provide either a blood or urine specimen for analysis, it is necessary to provide a method of analysis for these substances in both types of specimens.

The number of specimens in this study is small and care must be exercised in interpreting the results. The MBRS is currently undertaking a larger survey, involving the analysis of 2000 specimens both over and under the limit for alcohol and drugs. This data should he available in 2002 and will hopefully assist in assessing intoxicant driving trends and the Bureau's analytical needs.

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