ACT Government Analytical Laboratory

Forensic Chemistry and Toxicology Unit

Road Transport (Alcohol and Drugs) Act 1977

Report on analytical findings

Update January 2018

Dr Ian Whittall, Lachlan Kite and Simon Rockliff

ACT Government Analytical Laboratory (ACTGAL), Health Protection Service (HPS)

For further information email HPS@act.gov.au.

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Background

The *Road Transport (Alcohol and Drugs) Act 1977* (the Act, current version August 2017) specifies offences relating to driving while having drugs and/or alcohol present in the drivers blood and/or oral fluid. The ACT Government Analytical Laboratory (ACTGAL) of the Health Protection Service provides an analytical toxicology service to analyse biological specimens and report certified results on the presence of drugs and alcohol in such samples. ACTGAL is an "Approved Laboratory" and employs appointed "Analysts" as described in the Act.

Note that for the purpose of the Act, a "prescribed drug" includes tetrahydrocannabinol (THC), methylamphetamine and MDMA.

The laboratory provides an analytical toxicology service to support the following circumstances:

- The mandatory requirement for a hospitalised driver of a motor vehicle collision to undergo testing to ascertain the level of blood alcohol in the driver's blood sample.
- The mandatory requirement for a hospitalised driver of a motor vehicle collision to undergo testing to ascertain the presence/absence of a prescribed drug or drugs in the driver's blood sample.
- The testing of blood and/or other body (urine) samples for the presence and/or level of a prescribed drug or any other drug, to support a police investigation into driving under the influence of an intoxicating substance.
- Random roadside oral fluid testing for the confirmation of the presence of a prescribed drug or drugs.

A report was released in 2015 containing data from analytical testing and included:

- Blood alcohol analytical results for the period 2002-2014.
- Prescribed drugs and other drugs analytical results for the period March 2012-Jan 2015.
- Oral fluid analytical findings for the period November 2011 – January 2015.

This update report contains data from analytical testing for the years 2015-2017.

Blood alcohol analytical results

Table 1 contains the data from tests performed on blood samples that were submitted to ACTGAL in 2015-2017.

Table 1 – Blood Alcohol Analyses Performed at ACTGAL 2015-2017

Year	Positive	Negative	Total	% Positive
2015	104	1586	1690	6.15
2016	129	1469	1598	8.07
2017	93	1469	1562	5.95

Range of positive alcohol results

Table 2 contains the data for positive blood alcohol samples for 2015-2017 and the levels they pertain to as indicated in the Act.

Table 2 – Alcohol Positive Results by "Level" 2015-2017 [1]

	Conc. EtOH	2015		2016		2017	
	(g/100 mL)	Number Positive	Percent (%)	Number Positive	Percent (%)	Number Positive	Percent (%)
Level 1	0 - <0.050	17	16.3	15	11.6	20	21.5
Level 2	0.050 - <0.080	12	11.5	9	7.0	9	9.7
Level 3	0.080 - <0.150	34	32.7	39	30.2	24	25.8
Level 4	0.150+	41	39.4	66	51.2	40	43.0
Totals		**104**	**100**	**129**	**100**	**93**	**100**

1. Note that other than for "Special Drivers" as defined in the Act, it is not an offence to have a positive blood alcohol level less than 0.05 g/100mL.

Comparison to previous years

Table 3 contains the data from tests performed on blood samples that were submitted to ACTGAL from the years 2002 to 2017.

Table 3 – Blood Alcohol Analyses Performed at ACTGAL 2002-2016

Year	Positive	Negative	Total	% Positive
2002	141	823	964	14.63
2003	123	881	1004	12.25
2004	133	801	934	14.24
2005	142	956	1098	12.93
2006	146	830	976	14.96
2007	133	840	973	13.67
2008	140	898	1038	13.49
2009	134	966	1100	12.18
2010	130	1012	1142	11.38
2011	128	1241	1369	9.35
2012	123	1258	1381	8.91
2013	141	1422	1563	9.02
2014	118	1500	1618	7.29
2015	104	1586	1690	6.15
2016	129	1469	1598	8.07
2017	93	1469	1562	5.95
Totals	**2058**	**17952**	**20010**	**10.28**

The data from Table 3 is graphed in **Figure 1**.

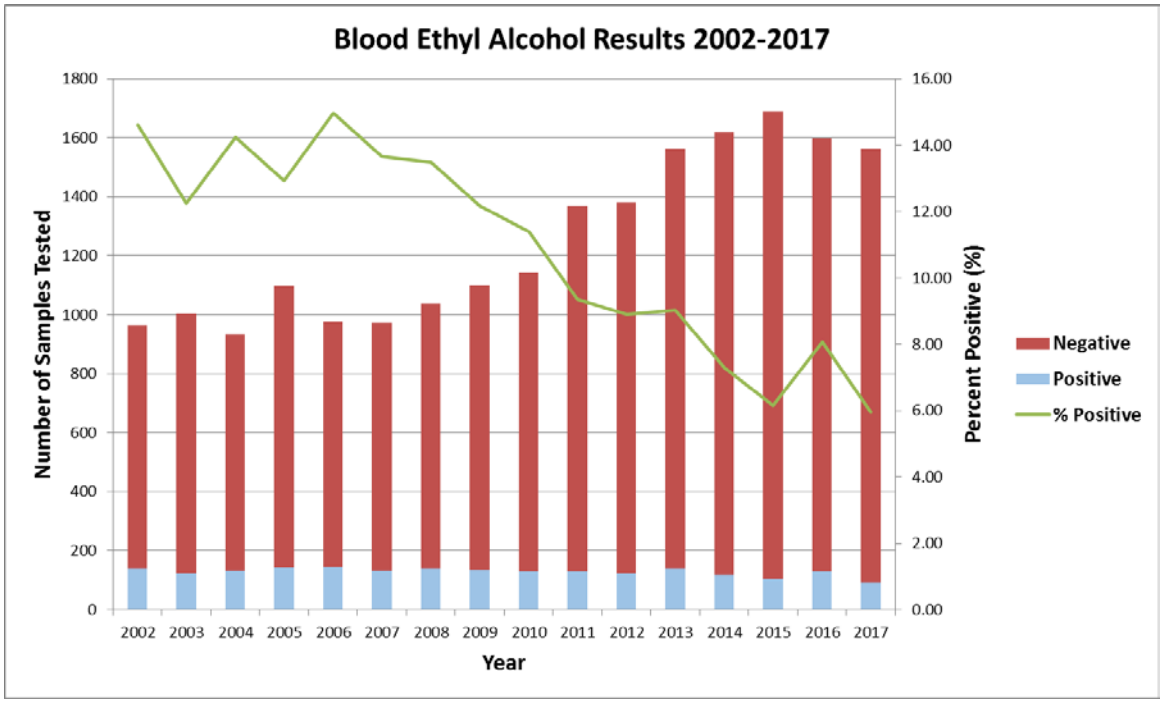

Figure 1 - Blood Alcohol Analyses Performed at ACTGAL 2002-2017

Blood drugs analytical results

Prescribed drugs in blood

The numbers of drugs reported and a breakdown of the drugs found for 2015-2017 are shown in **Table 4**.

Table 4 – Prescribed drugs detected 2015-2017

	2015		2016		2017	
	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)
Negative	1512	89.52	1444	90.36	1427	91.36
THC	97	5.74	76	4.76	69	4.42
Methylamphetamine	45	2.66	34	2.13	38	2.43
MDMA	7	0.41	7	0.44	4	0.26
THC + Methylamphetamine	23	1.36	31	1.94	19	1.22
THC + MDMA	3	0.18	2	0.13	3	0.19
Methylamphetamine + MDMA	1	0.06	2	0.13	0	0.00
All Three Prescribed Drugs	1	0.06	2	0.13	2	0.13
Total	**1689**	**100**	**1598**	**100**	**1562**	**100**

Prescribed drugs and alcohol in blood

The numbers of drugs and alcohol reported and a breakdown of the drugs and alcohol found in 2015-2017 are shown in **Table 5**.

Table 5 – Alcohol and Prescribed Drugs Detected 2015-2017

	2015		2016		2017	
	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)
Negative	1429	84.61	1346	84.23	1357	86.88
EtOH Only	80	4.74	98	6.13	70	4.48
THC Only	81	4.80	60	3.75	54	3.46
Methylamphetamine Only	45	2.66	29	1.81	35	2.24
MDMA Only	5	0.30	3	0.19	3	0.19
THC + Methylamphetamine	20	1.18	26	1.63	15	0.96
THC + MDMA	3	0.18	1	0.06	3	0.19
Methylamphetamine + MDMA	1	0.06	2	0.13	0	0.00
All Three Prescribed Drugs	1	0.06	2	0.13	2	0.13
EtOH + THC	19	1.12	16	1.00	16	1.02
EtOH + Methylamphetamine	2	0.12	5	0.31	3	0.19
EtOH + MDMA	2	0.12	4	0.25	1	0.06
EtOH + THC + Methylamphetamine	1	0.06	5	0.31	3	0.19
EtOH + THC + MDMA	0	0.00	1	0.06	0	0.00
EtOH + Methylamphetamine + MDMA	0	0.00	0	0.00	0	0.00
EtOH + All Three Prescribed Drugs	0	0.00	0	0.00	0	0.00
Total	**1689**	**100**	**1598**	**100**	**1562**	**100**

Prescribed drugs and alcohol concentrations in blood

Analytically, at ACTGAL, the approximate concentration of a detected prescribed drug is recorded for academic purposes.

Over the year 2015, the range and median alcohol and prescribed drug concentrations are shown in **Table 6**.

Table 6 – Alcohol and Prescribed Drugs Concentrations 2015

	EtOH (g/100 mL)	THC (ng/mL)	Meth. (mg/L)	MDMA (mg/L)
n	104	124	70	12
Min	0.010	2	0.005	0.010
Max	0.355	62	1.123	0.271
Median	0.124	5.1	0.110	0.027
Mean	0.130	7.7	0.184	0.072

Over the year 2016, the range and median alcohol and prescribed drug concentrations are shown in **Table 7**.

Table 7 – Alcohol and Prescribed Drugs Concentrations 2016

	EtOH (g/100 mL)	THC (ng/mL)	Meth. (mg/L)	MDMA (mg/L)
n	129	111	69	13
Min	0.010	2	0.005	0.013
Max	0.474	46	1.125	0.524
Median	0.153	5.0	0.140	0.050
Mean	0.154	7.5	0.225	0.126

Over the year 2017, the range and median alcohol and prescribed drug concentrations are shown in **Table 8**.

Table 8 – Alcohol and Prescribed Drugs Concentrations 2017

	EtOH (g/100 mL)	THC (ng/mL)	Meth. (mg/L)	MDMA (mg/L)
n	93	93	59	9
Min	0.010	2	0.004	0.005
Max	0.383	67	0.724	0.430
Median	0.135	7	0.157	0.064
Mean	0.139	9.4	0.193	0.098

The range and median of the three prescribed drugs, THC, methamphetamine and MDMA are presented in **Figures 2**, **3** and **4** respectively for the years 2015-2017.

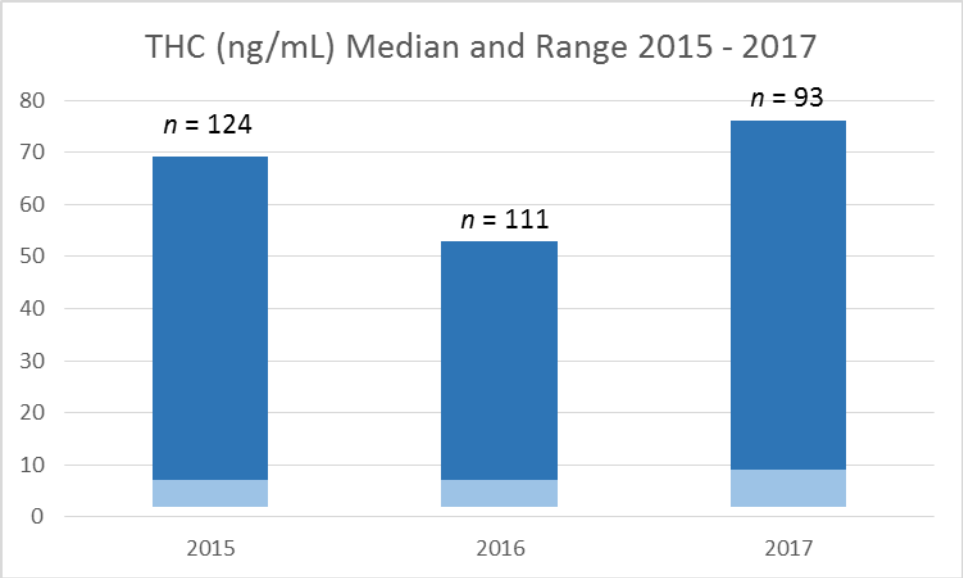

Figure 2 - Blood THC Median and Range (ng/mL) 2015-2017

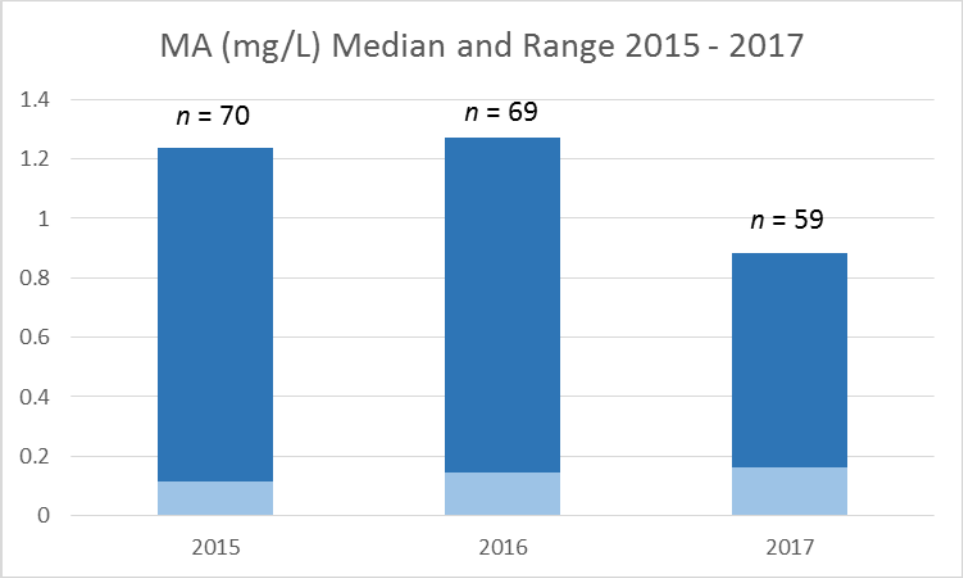

Figure 3 - Blood Methamphetamine Median and Range (mg/L) 2015-2017

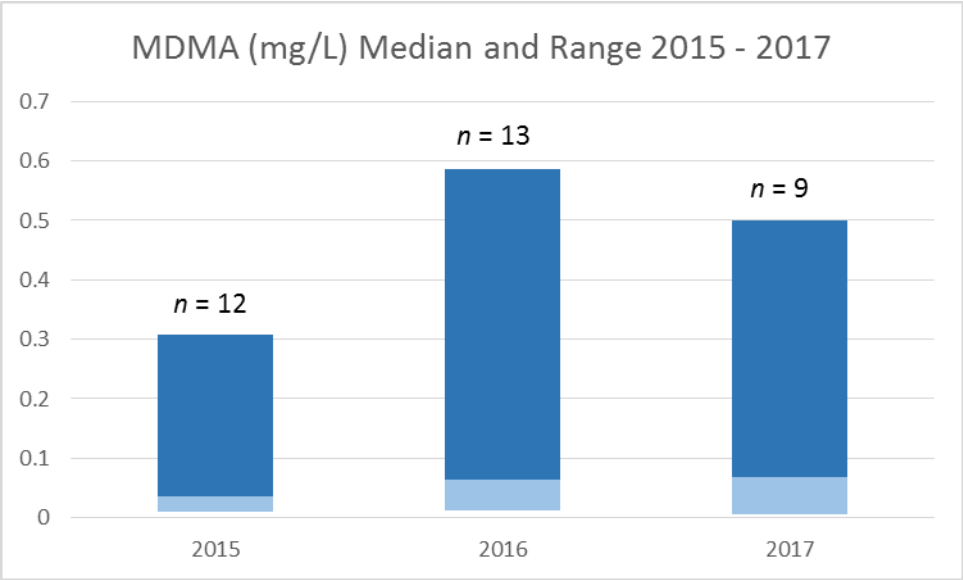

Figure 4 - Blood MDMA Median and Range (mg/L) 2015-2017

Prescribed drugs in 2015-2017 compared to previous years

The type and proportion of prescribed drugs contained in blood samples for 2015-2017 compared to the two previous years is tabulated in **Table 9**.

Table 9 – Prescribed Drugs Detected in 2013-2017

	2013		2014		2015		2016		2017	
	Number Positive	Percent (%)	Number Positive	Percent (%)	Number Positive	Percent (%)	Number Positive	Percent (%)	Number Positive	Percent (%)
THC	125	8.00	119	7.61	124	7.34	111	6.95	93	5.95
MA	69	4.41	58	3.71	70	4.14	69	4.32	59	3.78
MDMA	4	0.26	12	0.77	12	0.71	13	0.81	9	0.58

Note that **Table 9** includes samples where multiple drug presence was detected. Hence, the total number of drugs detected is greater than the total number of positive samples.

Oral fluid analytical results

As described in the background section above, there is a mandatory requirement for a hospitalised driver of a motor vehicle collision to undergo blood testing to ascertain the presence/absence of alcohol or a prescribed drug or drugs in the driver's blood sample. This results in over 1500 blood samples being tested at ACTGAL each year.

Oral fluid testing happens as a different regime where testing is performed at ACTGAL to confirm the presence of a prescribed drug that has been indicated by pre-screening of oral fluid conducted by ACT Policing at the road-side. This resulted in 570 confirmatory tests being performed at ACTGAL in 2017.

The results of oral fluid confirmations performed at ACTGAL in 2015-2017 are tabulated in **Table 10** and graphed in **Figure 5**.

Table 10 – Oral Fluid Analyses for 2015-2017

	2015		2016		2017	
	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)
THC	105	40.7	88	18.3	111	19.4
Methylamphetamine	66	25.6	200	41.7	265	46.4
MDMA	1	0.4	7	1.5	6	1.1
THC + Methylamphetamine	77	29.8	162	33.8	160	28.0
THC + MDMA	2	0.8	12	2.5	8	1.4
Methylamphetamine + MDMA	3	1.2	4	0.8	11	1.9
All three Prescribed Drugs	2	0.8	4	0.8	5	1.1
No Prescribed Drugs Detected	2	0.8	3	0.6	4	0.7
Total Number of Samples	258	100	480	100	570	100

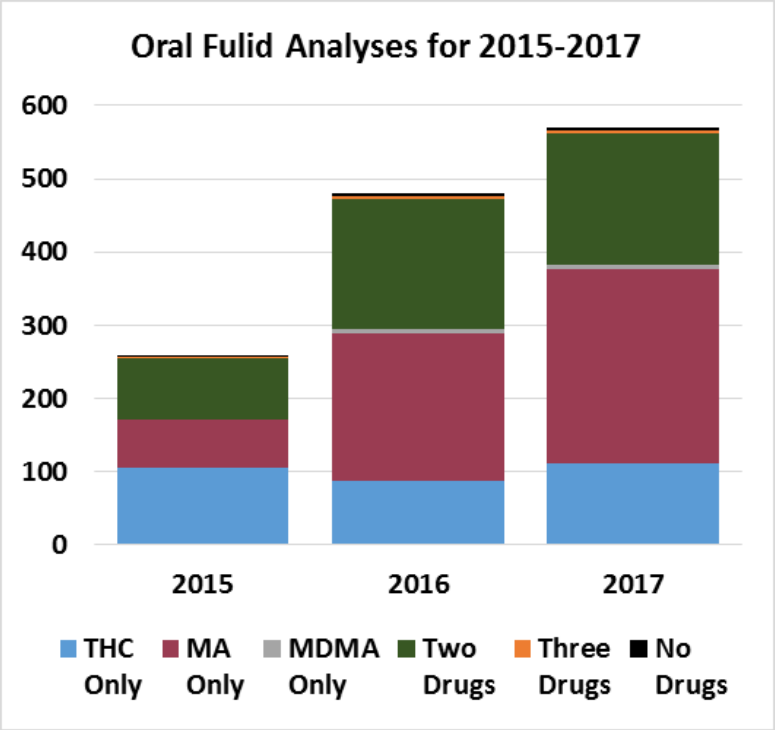

Figure 5 – Oral Fluid Analyses Performed at ACTGAL 2015-2017

The numbers of the occurrence of each drug as a proportion of the total number of samples are tabulated in **Table 11**.

Table 11 – Oral Fluid Analyses for 2015-2017 as a Proportion of Total Number of Samples

	2015		2016		2017	
	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)
THC	186	72.09	266	55.42	284	49.82
Methylamphetamine	148	57.36	370	77.08	441	77.37
MDMA	8	3.10	27	5.63	30	5.26
No Prescribed Drugs	2	0.78	3	0.62	4	0.70
Number of Times Detected	342		663		759	
Total Number Samples	258		480		570	

Note that **Table 11** includes samples where multiple drug presence was detected. Hence, the total number of drugs detected is greater than the total number of positive samples.