NOT IN OUR BACKYARD:

HOW CLANDESTINE DRUG LABORATORIES IMPACT THE HEALTH AND ENVIRONMENT OF OUR REGIONAL COMMUNITIES

August 2019

Authors:

Ms Juliet Duffy - **Director Regional EnviroScience and Chair Western Research Institute**

MSM (USYD) MAICD, 2018 NSW Regional Woman of the Year, 2018 AFR 100 Women of Influence

Juliet is the founding director of Regional EnviroScience and holds a Master of Sustainable Management. Juliet has been managing asbestos, hazardous materials and environmental issues since 1988, when the first National Code of Practice for Asbestos was implemented. An advocate for regional Australia and women in STEM, Juliet is also considered an expert in the field of naturally occurring asbestos and is a sought-after speaker at industry conferences nationally and internationally and she frequently travels the state educating government organisations, including councils on management of this issue.

juliet@enviroscience.com.au

Ms Kathy Woolley- CEO Western Research Institute.

GAICD, MIIA, Change Management Qualification (AGSM), BComm (Economics (with merit) - UWO), Public Participation Certificate (IAP^2), Cert. IV Workplace training and assessment (TAFE)

Kathy joined the WRI team in February 2018 having previously worked on a variety of boards and senior management roles across sectors including media, health, education, regional development, government, event management, research and sales. For a number of years Kathy also ran a consultancy specialising in services for not for profit entities, focusing on best practice techniques in management and governance. She spent 16 years in senior positions in three regional councils. She is a member of the Australian Institute of Internal Auditors and has developed internal audit and process improvement frameworks for a number of organisations.

kathy.woolley@wri.org.au

INTRODUCTION

Regional EnviroScience and the Western Research Institute have collaborated on a research project to identify the impacts on health and the environment from clandestine drug laboratories.

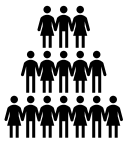
The findings presented in this report paint a sorry tale of the long term impacts to both the health of anyone who comes into contact with clandestine drug laboratories and to the environment.

There are salient lessons for those who are first responders to sites where drug laboratories have operated and concerning information about the unsuspecting home buyer of premises that have been used as laboratories. The long term residue on sites that have been clandestine drug laboratories is a concerning issue for regional communities.

METHODOLOGY

1. A summary of crime statistics illustrating drug related incidence longitudinal patterns in Australia.
2. Desktop review of data on impacts of illegal drug laboratories.
3. Collation of data on drug related crime and illegal drug laboratories for Australian regional areas.
4. Research for information on impacts arising from illegal drug laboratories – for example on property, impact on pets.

FINDINGS

	Amphetamine—Type stimulants (ATS – excluding MDMA[1]) are the second most consumed drug worldwide. In 2016-17 in Australia they were the second most consumed drugs after cannabis.
	**463** clandestine drug laboratories were detected in Australia in 2016-17 yielding **27.4 tonnes** of illicit drugs. This is equivalent to around **290** average weight adult males. **63.9%** of detections were in **residential** areas. **49.5%** of the sites were deemed to be addict (kitchen labs) based where production is for personal use or for sharing with friends.
	The **113,533** seizures in 2016-17 delivered: • 1 seizure every 5 minutes • 1kg seized every 19 minutes • 1 arrest every 3.5 minutes • 154,650 national drug arrests A decrease on the **number** of seizures in 2016-17 of 1.6% on the previous year - but notably a change in the **types of drugs** seized and an overall **increase** on **volume** of drugs seized: • While ATS detections in Australia reduced in 2016-17, MDMA detections **increased by 66.3%** over the previous year. • The **27.4 tonnes** detected in 2016-17 continued the growing volume trend and was 31% above the previous year weight.
	Queensland has had the most detections of clandestine drug laboratories between 2007-08 and 2016-17 (40.7%), followed by Victoria (17.7%). NSW came in third (13.2%) for a total of 818 detections.
	Environmental impacts of clandestine drug laboratories are exacerbated by the hazardous and toxic byproducts which have a long term life. Examples of sites showing no reduction in contamination levels after 10 years are evident.
	Risks to the health of those who enter premises where clandestine laboratories have been operating are significant and potentially lethal. Inexperienced "cooks" have limited chemical knowledge. Chemicals used are volatile and often highly combustible. Police, council workers and ambulance officers are at risk when entering sites as first responders. Future residents are impacted due to the residue in porous surfaces including carpets, walls and furnishings.

[1] Amphetamine-type stimulants (ATS) are a group of central nervous system stimulants which include amphetamine, methylamphetamine and 3,4-methylenedioxymethamphetamine (MDMA). MDMA is also referred to as ecstasy and has an important difference in chemical structure which results in hallucinogenic properties. Ibid, p22

CRIME STATISTICS RELATING TO DRUGS

The Australian Criminal Intelligence Commission "*Illicit Drug Data Report, 2016-17*[2]" identified a record level of 27.4 tonnes of illicit drugs were seized in Australia in 2016-17 from 113,533 national illicit drug seizures. The seizures led to 154,650 arrests.

The report provides annual information from a range of sources including all state and territory police services, the Australian Federal Police, the Department of Home Affairs, state and territory forensic laboratories and research centres.

Amphetamine—Type stimulants (ATS – excluding MDMA[3]) are the second most consumed drug worldwide.[4] In 2016-17 ATS were the second most commonly detected illicit drugs after cannabis in Australia. The 2016-17 ATS (excluding MDMA) detections indicate supply has remained at a similar level to the previous year. While the number of ATS (excluding MDMA) detections fell by 3.7% in 2016-17, MDMA detections increased by 66.3%.

2016-17 data showed the 5th consecutive period of decline in national illicit drug seizures, falling by 1.6% on 2015-16 levels. However, over the past decade, the number of national illicit drug seizures has increased by 85.2%, from 61,290 in 2007-08 to 113,533 in 2016-17.[5]

Waste water analysis is another source to assess the volume of drug consumption, and thus the size of the illicit drug market. The National Wastewater Drug Monitoring Program is considered to create a conservative estimate of illicit drugs consumed annually as detected in 50 wastewater treatment sites across Australia.

The 2016-17 Illicit Drugs Data Report identifies that based on the weight of illicit drugs seized in 2016-17 and the wastewater results of the above identified wastewater detection program, the "demand for harmful drugs remains robust".[6]

Number of illicit drug seizures nationally

	National Total	ATS	Cannabis	Heroin	Cocaine	Other and unknown drugs
2015-16	115,421	39,014	61,334	2,081	3,951	9,041
2016-17	113,533	37,351	60,006	1,951	4,567	9,658
% change	**-1.6%**	**-4.3%**	**-2.2%**	**-6.2%**	**15.6%**	**6.8%**

Source: Illicit Drug Data report, 2016-17, p12

[2] Australian Criminal Intelligence Commission, "Illicit Drug Data Report, 2016-17", July 2018, p5 , https://www.acic.gov.au/sites/default/files/iddr_2016-17_050718.pdf?v=1536906944 Accessed March 2019.

[3] Amphetamine-type stimulants (ATS) are a group of central nervous system stimulants which include amphetamine, methylamphetamine and 3,4-methylenedioxymethamphetamine (MDMA). MDMA is also referred to as ecstasy and has an important difference in chemical structure which results in hallucinogenic properties. Ibid, p22

[4] Australian Criminal Intelligence Commission, "Illicit Drug Data Report, 2016-17", July 2018, p21

[5] Ibid, p12

[6] Ibid, p13

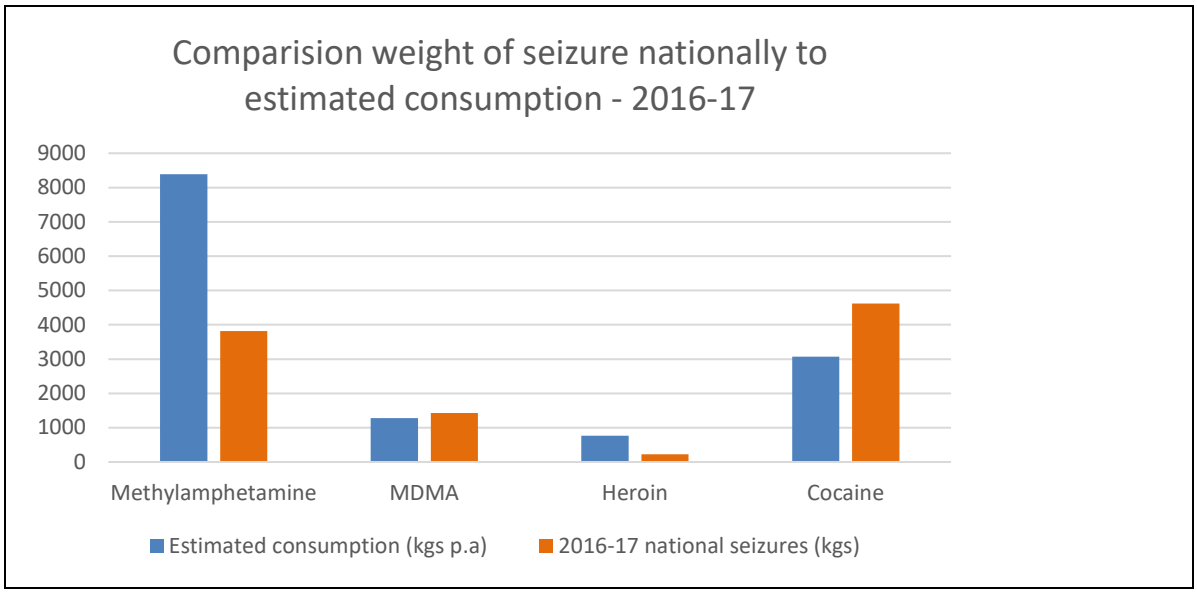
CLANDESTINE DRUG LABORATORY IMPACTS

Weight of illicit drugs seized nationally – 2015-16 and 2016-17

	National Total (tonnes)	ATS (kgs)	Cannabis (kgs)	Heroin (kgs)	Cocaine (kgs)	Other and unknown drugs (kgs)
2015-16	21.0	9,218	6,081	220	721	4,777
2016-17	27.4	7,571	7,547	224	4,623	7,524
% change	**30.5%**	**-17.9%**	**24.1%**	**1.8%**	**541.2%**	**57.5%**

Source: Illicit Drug Data report, 2016-17, p12

Comparison weight of seizure nationally to estimated consumption - 2016-17



Source: Illicit Drug Data report, 2016-17, p13

Crime incidence and drug usage

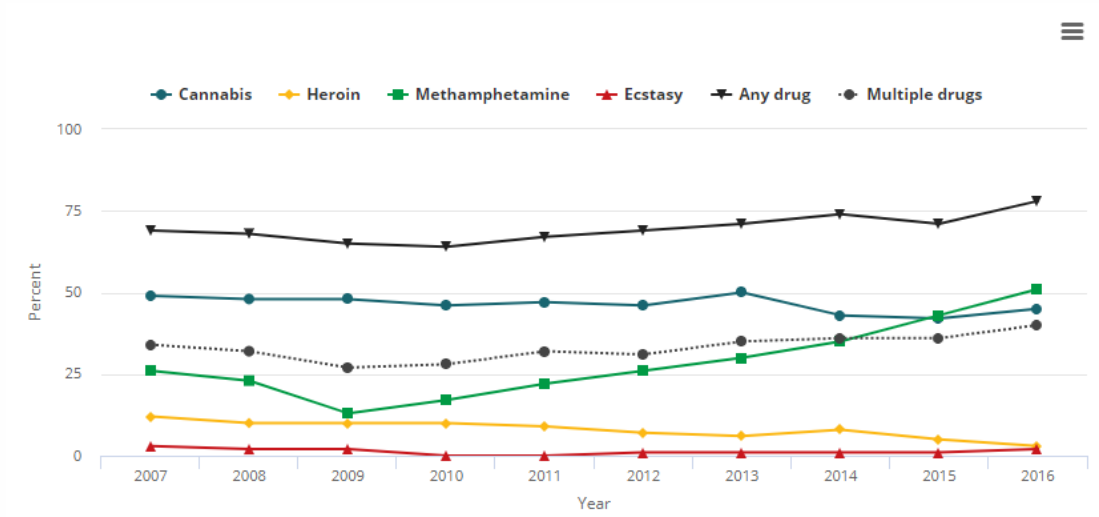
Linkages between illicit drug usage and crime statistics have been considered in growing volumes of research. Strong causal links are yet to be fully established, but the following analysis illustrates some of the recent findings on the linkages between crime and illicit drug use.

Goldsmid and Willis[7] reported that methamphetamine usage increases the risk of engagement in acquisitive crimes and is a contributing factor in offending, due to impacts of intoxication or the need for funds to buy drugs. This research identifies substantial empirical evidence on the association between illicit drug use and offending and specifically about the methamphetamine usage association with increased risk of violence and of property offences.

Since 1999, the Drug Use Monitoring Program (DUMA)[8] reported by Crime Statistics Australia has collated quarterly criminal justice and drug use information from police detainees at four long term sites in Adelaide, Bankstown, Brisbane and Perth. Information is collected via a self-report survey or voluntary urinanalysis.

Positive tests of illicit drug has doubled in the decade to 2016. The graph below shows the distribution of positive tests across a range of illicit drugs. The escalation of incidents of positive drug tests for methamphetamines is notable.

DETAINEES WHO TESTED POSITIVE TO ILLICIT DRUGS AT TIME OF DETENTION BY DRUG TYPE, 2007-2016 (%)



Source: Crime Statistics Australia, *"Drug monitoring in Australia – trends in alcohol and other drug use, 2007-2016"* - http://www.crimestats.aic.gov.au/DUMA/1_trends/#overallTrends. Accessed March 2019.

[7] Goldsmid, S. and Willis, M. - *Methamphetamine use and acquisitive crime: Evidence of a relationship,* Australian Institute of Criminology trends and Issues, No 516, October 2016 ISSN: 0817- 8542**.** Accessed March 2019.

[8] DUMA is an ongoing illicit drug monitoring data collection process undertaken with approximately 2,200 detainees in police custody annually.

The table below has been extracted from the Goldsmid and Wallis report to illustrate the research findings relating to methamphetamines by service offence classification (number) taken from research by Australian Institute of Criminology Drug Use Monitoring in Australia 2013 data (computer files):[9]

Table 4: Role of methamphetamines in current offending, by most serious offence classification (number)

	Needed money (n)	High on it (n)	Hanging out for it (n)	Other reason (n)
Violence	11	25	4	21
Property	13	23	0	20
Drug	2	10	0	20
Traffic	0	3	0	3
Disorder	0	3	2	0
Breach	2	7	1	38
Other	0	0	0	0
Total	28	71	7	102

Source: AIC Drug Use Monitoring in Australia 2013 [computer file]
Source of table: Goldsmid and Wallis, 2016, p10

Homelessness has been identified as an outcome of drug addiction. Payne et al identified that 15% of those they identified in research on homelessness identified drug related issues as the highest reason for their homelessness.[10]

[9] Goldsmid and Willis, ibid p 10
[10] Payne, J., Macgregor, S. and McDonald, H. "Homelessness and housing stress among police detainees: results from the DUMA program, 2015, p5

Some key dates

Timeline	
1963	*First illicit amphetamine-type stimulant (ATS) laboratory detected in United states*
1970's	*Large scale illicit production of ATS began in Victoria*[11]
1976	*First clandestine ATS laboratory detected in Sydney* [12]
1997	*97% of clandestine drug laboratories in the United States were making amphetamines and methylamphetamines*
1990's	*Notable increase in Illicit ATS product and provision of product internationally from Australia*[13]
1990's	*Substantial part of the global clandestine ATS production taking part in Australia (UNDCP 1996:48)*
2003	*International Narcotics Control Board establishes Project Prism- to monitor and target chemical used in illicit drug production of ATS.*
2005-06	*390 clandestine laboratories detected in Australia*
2006	*United Nations Office on drugs and Crime publishes guidelines for Safe Disposal of Chemicals used in the illicit manufacture of Drugs*
2006	*International Narcotics Control Board establishes Project Cohesion – monitors and targets chemical related to the production of heroin and cocaine*
2010	*Revision of the United Nations Office on drugs and Crime guidelines for Safe Disposal of Chemicals used in the illicit manufacture of drugs*
2011	*Australian Crime Commission – Clandestine Drug Laboratory re-mediation guidelines*
2012	*International Narcotics Control Board implemented Precursor Incident Communications System – sharing intelligence across countries*
2014-15 and 2018-19	*Victorian Police expansion of the Forensic Drug branch – strengthening drug intelligence capability*
2015	*South Australia National Law Enforcement Methylamphetamine Strategy – also known as operation VITREUS*
2015	*Methylamphetamine enforcement action Plan in Western Australia – reducing supply and enhancing seizure methods*
2016	*262.5kgs of methylamphetamine seized in Operation BLEUE – largest seizure in 2016 – sophisticated concealment in 3 shipping containers*

[11] Schloenhardt, 2007, p16
[12] Caldicott, 2005, p156
[13] Schloenhardt, ibid

2016	*Leuckart synthetic system of manufacture of MDMA ENIPID samples re-emerged.*
2016-2018	*Operation Atlas in South Australia – aimed at reducing demand and supply of ATS, community engagement processes*
2016	*South Australian Government proclaimed the Practice Guidelines for the management of clandestine laboratories under the SA Public Health Act 2016*
2017	*Update to the United Nations Office on drugs and Crime guidelines for Safe Disposal of Chemicals used in the illicit manufacture of drugs*
2017	*Drug Transit route legislation in Australia – additional powers to conduct targeted searches for prohibited drugs*
2017	*Misuse of Drugs Amendment (Methylamphetamine Offences) Act – new level of penalty of life imprisonment for some drug related matters*
2018	*Queensland re-introduces Drug Court*
2019	*United Nations Office on Drugs and Crime launches the UN Toolkit on Synthetic Drugs – how to approach challenges relating the synthetic drugs particularly opioids on March 19 2019*

CLANDESTINE DRUG LABORATORY IMPACTS

Characteristics of clandestine drug laboratories

- Range from crude to highly sophisticated set ups
- Amphetamine-type stimulants (ATS - excluding MDMA) most commonly manufactured drug in laboratories
- Prevalent in residential areas (63.9% of detections)
- Next largest location for laboratories was vehicles
- 49.5% of detected laboratories discovered in 2016-17 were addict based sites producing small amounts for personal consumption/friends

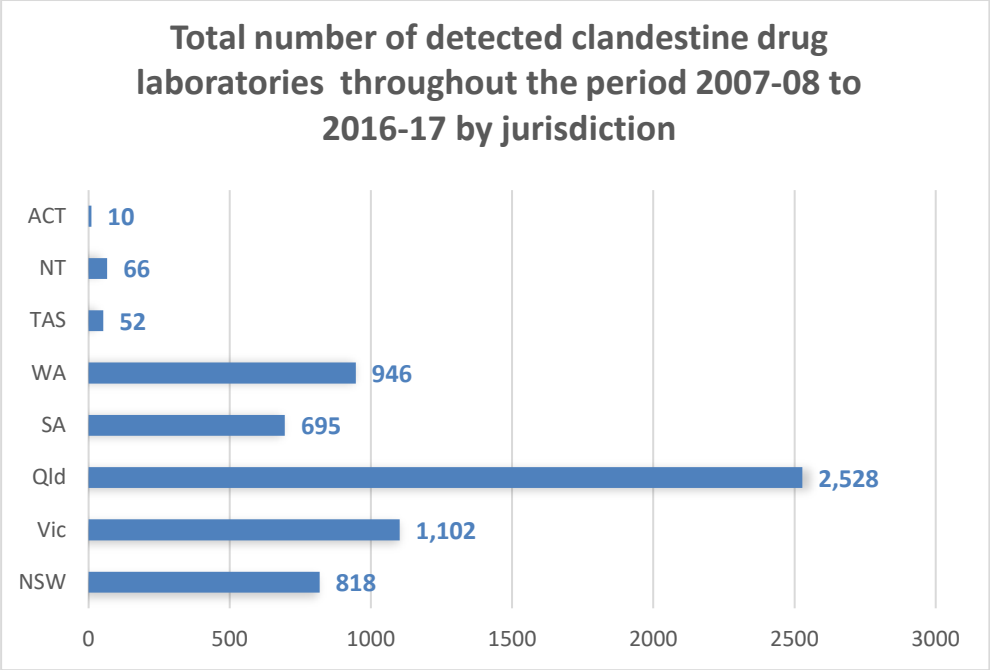
Impact of clandestine drug laboratories

The Australian Criminal Intelligence Commission Illicit Drug Data annual reports provide longitudinal information on the number of clandestine drug laboratories that have been identified over many years.

Detection of clandestine drug laboratories in Australia

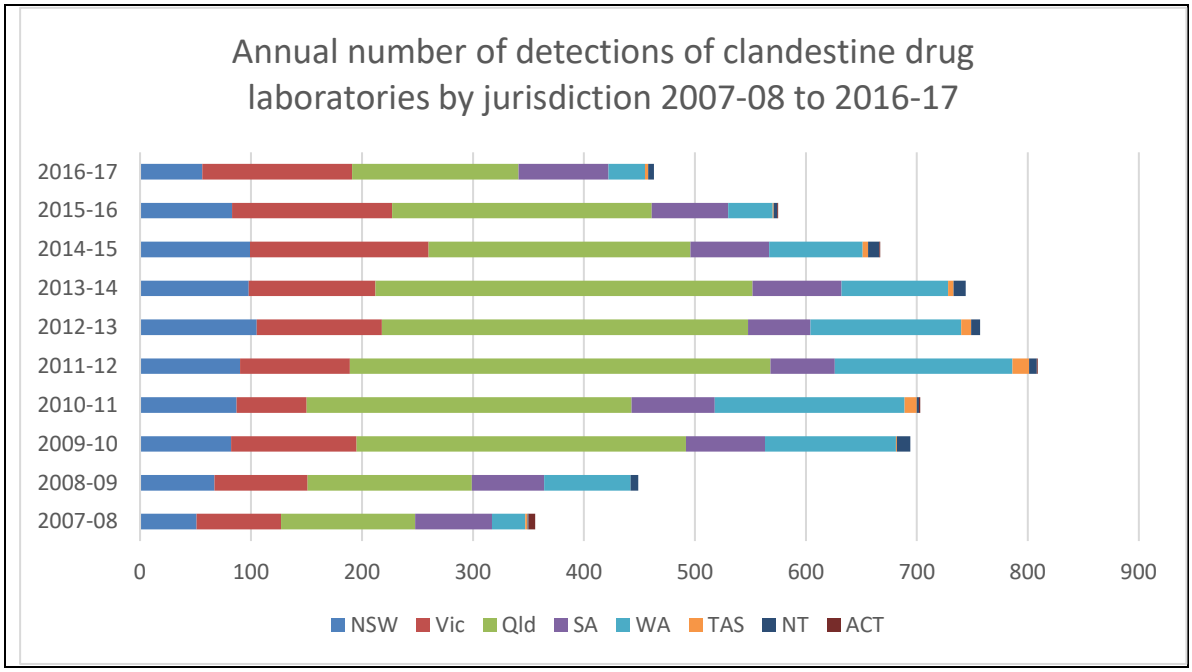
The graph below shows the distribution of the 6,217 total detections reported of clandestine drug laboratories by jurisdiction between 2007-08 and 2016-17 from the Illicit Drug Data annual reports.

The number of detections in Queensland is well above the other states throughout the decade with 40.7% of total detection numbers being in that state. Victoria follows with 17.7% and NSW on 13.2%.



Source: Illicit Drug Data Report 2016-17, p15

Looking at the data on a jurisdictional shown and annual detection numbers, the decade of data between 2007-08 and 2016-17 is shown in the following graph and table.



Source: Illicit Drug Data Report 2016-17, p115

Jurisdictional information from the past decade illustrated in the table below from the same report indicates falls in the number of detections in NSW, Victoria, Queensland, Western Australia and the Australian Capital Territory. Other states increased in detection numbers in the 2016-17 year compared to the previous year.

Despite the reduction in Queensland detections, the state continues to have the highest incidence of clandestine laboratories across all states.

TABLE 24: Number of clandestine laboratory detections, by state and territory, 2007–08 to 2016–17

Year	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
2007–08	51	76	121	69	30	2	1	6	**356**
2008–09	67	84	148	65	78	0	7	0	**449**
2009–10	82	113	297	71	118	1	12	0	**694**
2010–11	87	63	293	75	171	11	2	1	**703**
2011–12	90	99	379	58	160	15	7	1	**809**
2012–13	105	113	330	56	136	9	8	0	**757**
2013–14	98	114	340	80	96	5	11	0	**744**
2014–15	99	161	236	71	84	5	10	1	**667**
2015–16	83	144	234	69	40	1	3	1	**575**
2016–17	56	135	150	81	33	3	5	0	**463**

Source: Illicit Drug Data Report 2016-17, p115.

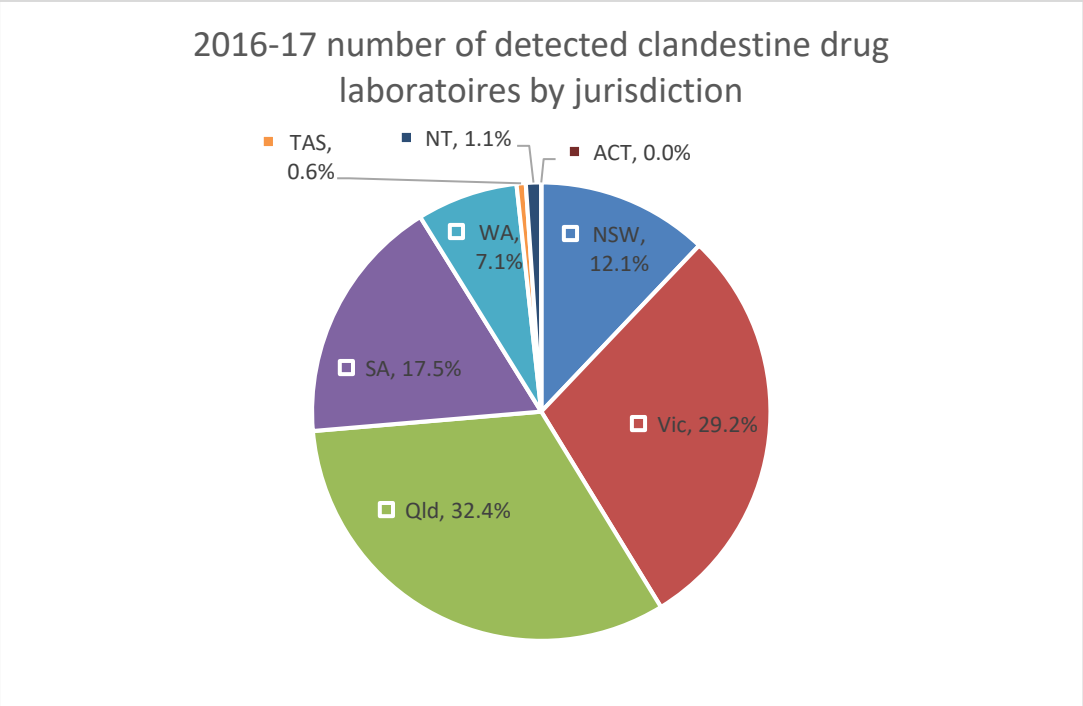
2016-17 clandestine laboratory detections

2016-17 detections of clandestine laboratories fell by 19.5% on the 2015-16 level.

The Illicit Drugs Data report for 2016-17 notes that the decline in the number of detected laboratories does not necessarily indicate a reduction in the volume of drugs being produced. Production levels are influenced by the skills of the people involved and the method of manufacture and the quality of the equipment being used. Nor does the fall in detections lessen the "serious risk to humans and the environment"[14].

In 2016-17, the jurisdictional distribution of detections of clandestine drug laboratories retained the ranking order of states illustrated in the decade of data above, with the highest incidences in Queensland (32.4%), followed by Victoria (29.2%) and NSW (12.1%).

The 2016-17 jurisdictional results are shown in the pie chart below.



Source: Illicit Drug Data Report 2016-17, p115

[14] Australian Criminal Intelligence, ibid p114

CLANDESTINE DRUG LABORATORY IMPACTS

The number of clandestine laboratories detected in 2016-17 was the 5th consecutive annual reporting period decrease, with detections falling from 575 in 2015-16 to **463** in 2016-17[15]. The majority of laboratories detected were producing ATS (excluding MDMA). The predominant method of production was the hypophosphorous method.[16] Laboratories detected in 2016-17 producing MDMA fell from 17 in 2015-16 to 8 in 2016-17.[17]

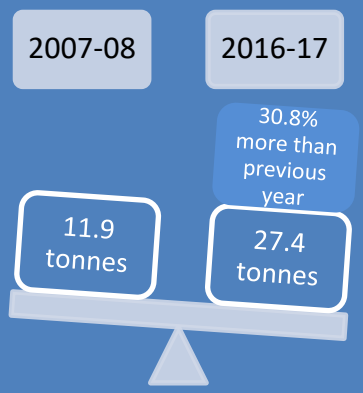
The Illicit Drug Data 2016-17 report notes however that the diminishing number of detections may not necessarily illustrate a reduction in volume of illicit drug manufacture as the production outputs are influenced by the techniques used and the skills of those manufacturing the drugs. The weight of **all** illicit drugs seized nationally has increased by 129.6% over the past decade, from 11.9 tonnes in 2007-08 to a **record 27.4 tonnes in 2016-17**. A 31% increase in 2016-17 over the previous year in the weight of illicit drugs seized was noted.[18]

The number of national ATS seizures decreased by 4.3% in 2016-17 over the previous year and weight of the seizures decreased by 17.9% in the period. Amphetamines accounted for 81.7% of the national ATS seizures and 50.5% of the weight of ATS seizures in 2016-17. [19]

NSW based seizures accounted for the greatest proportion by number (36.9%) and weight (63.1%) of the national ATS seizures in 2016-17.

Drug profiling of both border and domestic seizures identified that ephedrine and pseudoephedrine remain the dominant methylamphetamine precursors (the starting materials for illicit drug manufacture).[20]

129.6% increase in the weight of all illicit drugs seized nationally over the past decade:



Number of clandestine drug laboratories detected nationally in 2016-17 was **463**, a decrease on the 2015-16 number of detections (575).

56 of the detections of clandestine drug laboratories were in NSW in 2016-17.

63.9% of detected laboratories were in **residential** locations in 2016-17 (68.5% in 2015-16).

4.1% of clandestine laboratories detections were in rural areas in 2016-17 (down from 5.2% in 2015-16).

[15] Australian Criminal Intelligence Commission, "Illicit Drug Data Report, 2016-17", July 2018, P29
[16] Ibid, p15
[17] Ibid, p29
[18] Ibid, p12
[19] Ibid, p36
[20] Ibid, p15

CLANDESTINE DRUG LABORATORY IMPACTS

The impacts of clandestine drug laboratories is influenced by the nature of the laboratory set up.

Clandestine drug laboratories detected nationally in 2016-17 had these characteristics[21]:

Name of laboratories	Characteristics
Addict based (Also known as kitchen labs)	• 49.5% of detections in this category in 2016-17 Decrease from 66.5% in 2015-16 • Using basic equipment and simple procedures • Improvised equipment • Typically there is limited or non existent knowledge of chemistry held by those using these laboratories. • Small production amounts typically for own use
Other small scale laboratories	• 27.7% of detections in 2016-17 – increase from 16.1% on the previous year detections • Similar size to addict based laboratories • More advanced knowledge of chemistry • More complex drugs usually made • Usually non-improvised equipment • Manufacture for personal use or for limited close associates • Typical manufacture per cycle of ATS is 500 grams of substance
Medium sized laboratories	• 20% in 2016-17 (up from 9.7% in previous year) • Commercially available equipment and glasswear • Some equipment custom made • Not very mobile • Production primarily for illicit economic gain • Volume of yield per ATS cycle typically 0.5-50 kilograms.
Industrial scale laboratories	• Decreased to 2.7% in 2016-17 (from 7.7% in previous year) • Oversized equipment and glasswear that is custom made or purchased from industrial processing sources • Large production volumes in short periods of time • Typical cycle of ATS would yield 50 kilograms or more

[21] Ibid, p130

CLANDESTINE DRUG LABORATORY IMPACTS

Significant types of drugs being made in laboratories detected in 2016-17 were:

Type of laboratory	Increase/decrease 2016-17 compared to 2015-16 detections	% change
ATS (excluding MDMA) – 305 detections		-8.4%
Home bake heroin – 1 detection		-80%
Cannabis oil extraction – 21 detections. Note: even though is a decrease, this represents the second highest number since reporting commenced in 2007-08.		-19.2%
Gamma-hydroxybutyrate (GHB) / gamma-butyrolactone (GBL) – 11 detections		stable
Extracting pseudoephedrine – 12 detections		-25%

Other drug types detected included a range of other illicit drugs, precursors and pre-precursors (used in the production processes). This included dimethyltryptamine (DMT), 3,4-methylendioxyamphetamine (MDMA), mescaline, psilocybin and phenyl-2-propoanone (P2P), with both heroin and cocaine extraction also identified in this reporting period.[22]

Production methodologies used in detected ATS clandestine laboratories in 2016-17 were characterised as:

- The number of hypophosphorous laboratories detected nationally decreased 20.2% from 168 in 2015–16 to 134 in 2016–17.
- The number of red phosphorous laboratories increased 60.7% from 28 in 2015–16 to 45 in 2016–17.
- The number of Nazi/Birch laboratories detected nationally decreased 21.9% from 32 in 2015–16 to 25 in 2016–17.
- The number of P2P laboratories more than doubled this reporting period, from 9 in 2015–16 to 19 in 2016–17.

[22] Ibid, p116

- The number of ATS (excluding MDMA) laboratories detected nationally identified as using other methods of production increased threefold this reporting period, from 7 in 2015–16 to 21 in 2016–17.[23]

Location and categories of detected clandestine laboratories[24]:

- 63.9% of detected laboratories were located in residential areas in 2016-17 (2015-16 figure of 68.5%.)
- 12.5% were in vehicles (up from 9.6% in 2015-16).
- Commercial/industrial locations accounted for 6.0% in 2016-17 compared to 4.0% in the previous year.
- 4.1% of the detected laboratories were in rural areas (down from 5.2% in 2015-16).

The Illicit Drug Data reports identify 4 categories of operating status of clandestine laboratories[25]:

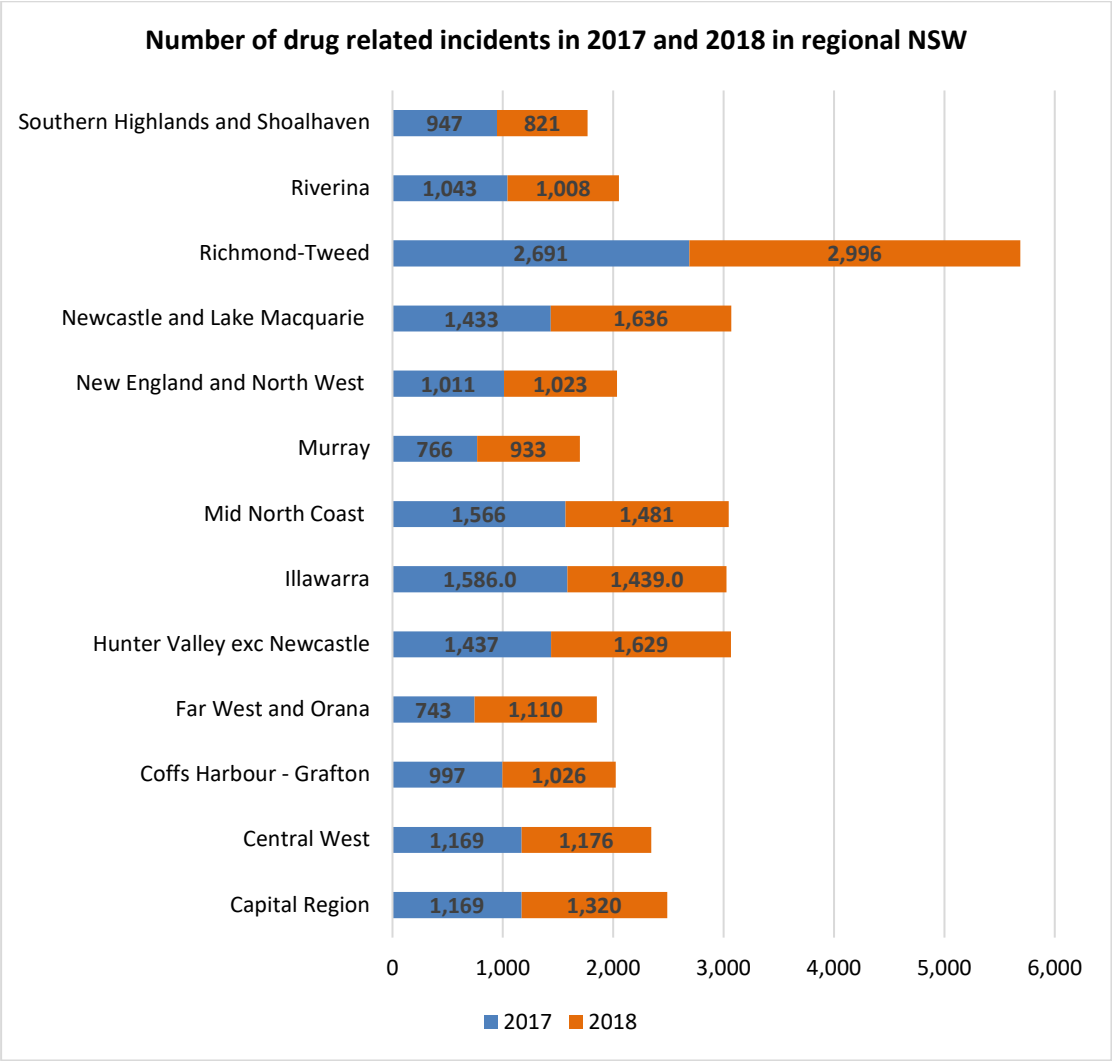
Category	Characteristics	Movement on previous year	2016-17 detections
Category A	Active – chemical and equipment in use		8.0% (decrease from 8.2% in 2015-16)
Category B	Stored/used – equipment and chemicals – fully assembled but not in use at the time of detection		29.1% of detections (increase from 18.5% in 2015/16)
Category C	Stored/unused - equipment and chemicals		Most commonly detected category – 49.4% (decrease from 61.4% in 2015-16)
Category D	Historical site		13.4% (increase from 11.9% in 2015-16)

[23] Ibid, p117
[24] Ibid, p118
[25] Ibid, p118

Regional drug related crime

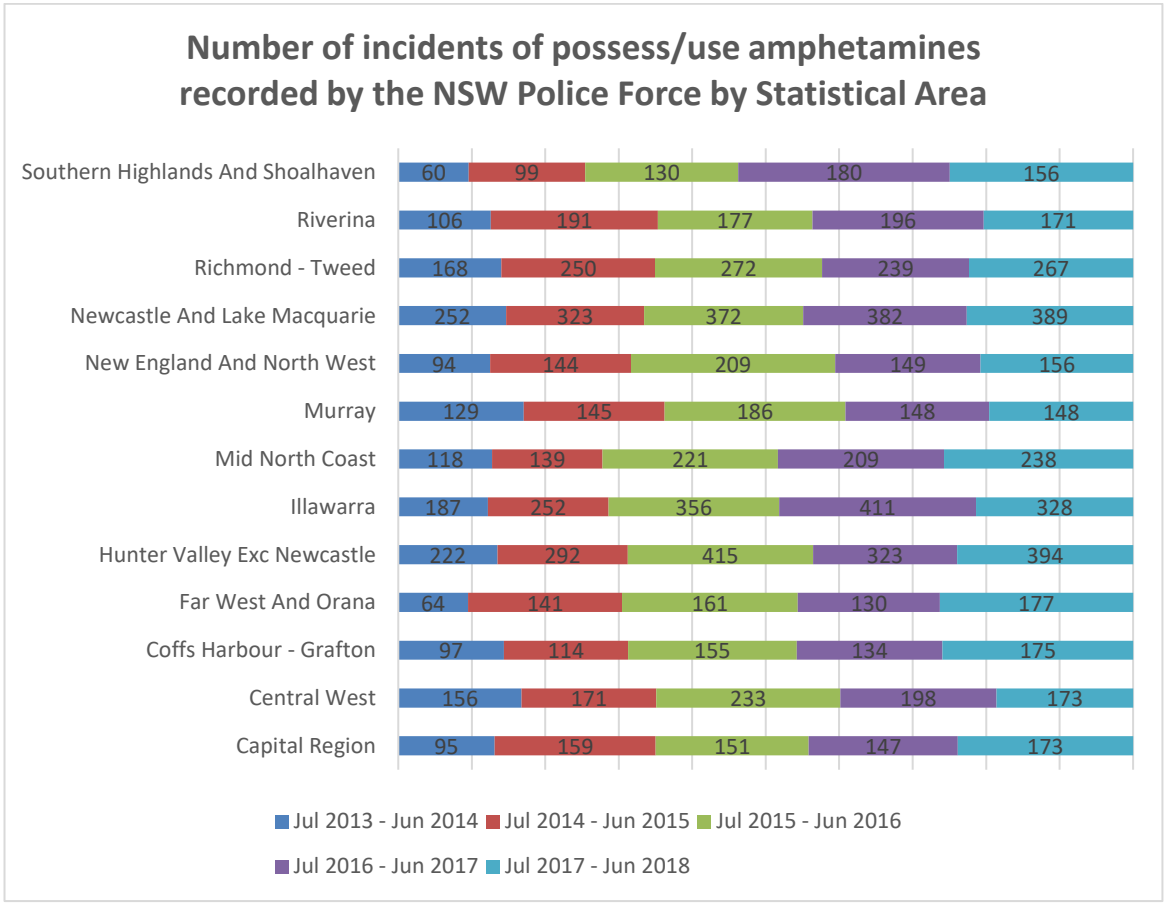
The NSW Bureau of Crime Statistics and Research publishes quarterly regional statistics on crime incidents, trends and rates.

The table below provides the statistics for the police statistical regions in NSW of drug related incidents in the calendar years for 2017 and 2018.



Source: NSW Bureau of Crime Statistics and Research. Reference: SA_trends18Q4. Accessed online March 2019.

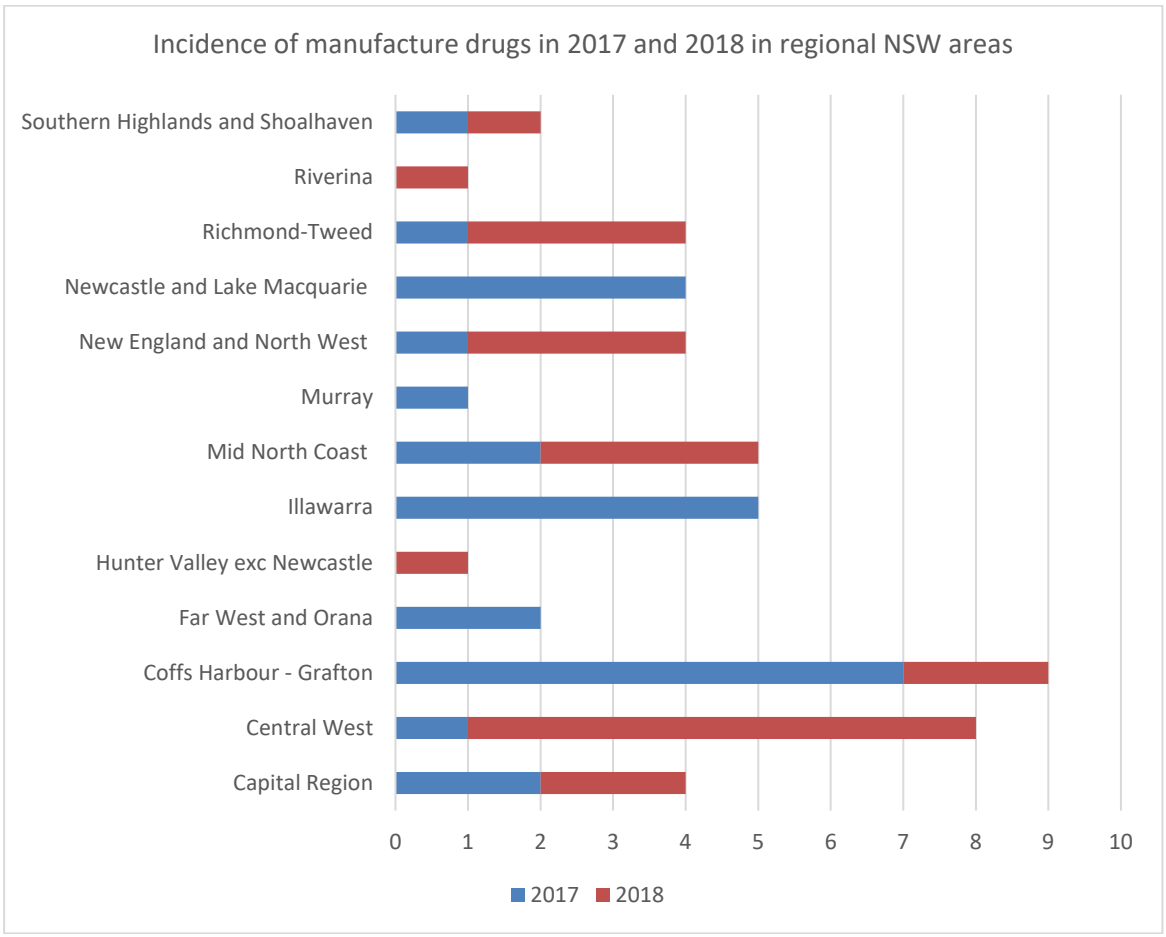
The prevalence of drug related crimes involving amphetamines identified in national statistics is echoed in the regional data as illustrated in the graph below.



Source: NSW Bureau of Crime Statistics and Research. Reference: SA_trends18Q4. Accessed online March 2019.

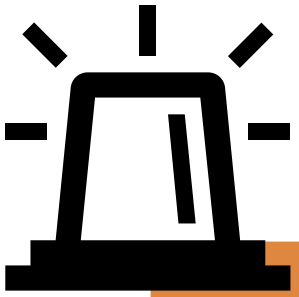
CLANDESTINE DRUG LABORATORY IMPACTS

Regional numbers of charges relating to the manufacturing of drugs in NSW are shown in the graph below over the 2017 and 2018 years. Overall annual number of manufacture drug related crime fell from 27 in 2017 to 23 in 2018. Over the two years, prevalence of incidence is shown in the NSW police statistics areas of Coffs Harbour- Grafton and the Central West of NSW.



Source: NSW Bureau of Crime Statistics and Research. Reference: SA_trends18Q4. Accessed online March 2019.

CLANDESTINE DRUG LABORATORY IMPACTS



Impacts and risks of clandestine drug laboratories

- Large volume of chemicals required in production processes - many are highly toxic and corrosive
- Volatility of by products and chemicals (particularly solvents which are the most common chemicals found and evaporate easily, may produce flammable vapours)
- Contamination of specific location and potentially surrounding soil, water and air
- Unskilled workers lacking chemistry knowedlge
- Lack of protective equipment when "cooking" and when sites detected
- High prevalence of children on site - endangering their health

Impacts of clandestine drug laboratories

There has been considerable research relating to the harm caused by consumption of illicit drugs but less research has been undertaken relating to the health dangers for those making illicit drugs and of the environmental impacts clandestine drug laboratories have. This is concerning when the risks to those working in sites and entering sites where laboratories have operated are high. Health, environmental and clean up processes arising from the operation and detection of clandestine laboratories requires considerable care.

Health issues

While this report has identified statistics that show a decline in the number of detections of clandestine laboratories over the past 5 years, the risks relating to the clean up of sites used for laboratories and the lingering nature of the contamination on those sites remains an area of concern. It is particularly challenging given the prevalence of addict-based or small laboratories (which can be in vehicles and are therefore highly mobile), where skills and knowledge of chemistry and "Gerry rigged" equipment can add to the risks for the "cooks" who manufacture the drugs.

Caldicott et al (2005)[26] identified the following conclusions in their research paper regarding the management of clandestine drug laboratories:

- There are significant health and environmental implications from contaminated sites
- First responders (those responsible for identification of sites and remediation/dismantling etc including police, ambulance officers, health inspectors and site remediation officers) need to have specialised knowledge of risks associated with current and past laboratory sites
- Clinicians should familiarise themselves with types of injuries associated with the sites
- "Cooks" and others in laboratories may be in contact with materials that are directly corrosive or that can be absorbed through the skin to cause systematic toxicity and local skin impacts

"An explosion at a small western Sydney shopping complex has led to the discovery of a secret drug laboratory. A 32-year-old man received serious burns to nearly half his body after the explosion in a residential apartment on the second storey of the Monfarville Street shopping centre at St Marys. When police investigated the fire they found a bathroom drug manufacturing operation including drug paraphernalia, precursor chemicals and methyl-amphetamine (speed). It is the eighth backyard drug lab to be discovered in the Sydney area this month, including one in a bust at Granville yesterday. The blast at St Marys yesterday caused substantial damage to the building and scattered debris outside, a NSW Fire Brigade spokesman said."[1] [The patient died of his burns five weeks later.]

Source: Caldicott et al 2005, p155

"A release of anhydrous ammonia in Florida forced the relocation of 2,000 school children for 3 days"

Source: Caldicott et al 2005, p 159

[26] Caldicott et al, *Clandestine drug laboratories in Australia and the potential harm, Australian and New Zealand Journal of Public Health, vol 29,No: 2, 2005*

- Those involved with manufacturing seldom have experience, knowledge and are seldom training in synthetic chemistry

Health related impacts from exposure to chemicals found in clandestine laboratories can result in:

- headaches
- elevated heart rate
- feelings of high adrenaline or euphoria
- burning feeling in lungs and/or throat
- watery or burning eyes
- nausea
- burning skin
- coughing or choking
- pain in diaphragm (chest)
- feeling of coldness or weakness
- shortness of breath/dizziness
- decrease in cognitive function, vertigo, and convulsions.[27]

Bystanders/neighbours need to understand the inherent risks from laboratory locations to their health and to the environment they work or live in. In the United States between 2000-2004, injuries were identified relating to 31% of the 1,791 detections of methamphetamine laboratories. 531 of the injuries were to police and 314 to private citizens. 9 fatalities occurred. 20% of the injuries were to children.[28]

Two people were found in a vehicle in a paddock near Gladstone, Queensland. One offender was suffering from severe injuries that were consistent with being involved in a chemical explosion.

In Kingswood, New South Wales, an explosion and fire occurred at a townhouse. A clandestine laboratory was found to have been the cause of the explosion and 70 litres of diethyl ether were found at the premises. The fire did not ignite the diethyl ether: if it had there could have been an explosion, resulting in destruction of property and possibly loss of life.

In Western Australia a 'relatively safe' amphetamine laboratory exploded during the final clean-up and removal of chemicals. A chemical contractor employed to remove the chemicals was seriously injured and a forensic chemist and a female police officer were also injured.
Source: Illicit drug data report 1997-98

Impacts on first responders

First responders in particular are at risk from processes involved in site identifications and clean ups. They risk inhalation of toxic fumes and impacts on their skin upon entering sites if appropriate protective equipment is not worn. Turning off cooling systems or the power can increase the potential for explosions. Ventilation of the site is a first order step when detection is made, but, given the localities are often in residential areas, the impact on neighbours has to be considered.

Emergency departments need to be able to determine the appropriate treatment for anyone injured in clandestine laboratory accidents or detections. With accidents involving the "cooks" or others involved in the production processes, there may be a level of concealment of the cause of their

[27] Department Health (WA), *Clandestine drug laboratories fact sheet,* https://ww2.health.wa.gov.au/~/media/Files/Corporate/general%20documents/Clandestine%20drug%20labs/PDF/Clandestine-drug-laboratories-brochure-joint-DOH-WA-Police.pdf. Accessed March 2019
[28] Betsinger, 2006, https://ohsonline.com/Articles/2006/11/Coping-with-Meth-Lab-Hazards.aspx

injuries. Caldicott et al also identified that there are possibly secondary risks for emergency workers exposed to contaminated patients from laboratory incidents.[29]

Impacts on children

The health risks to children from clandestine laboratories are significant.

Even higher statistics of United States data from 2001 than reported above identified that children were present in 2,028 raids of clandestine drug laboratories. Of these children, 700 tested positive to toxic levels of chemicals. In 2002, United States raids identified a further 1,382 children as having been exposed to chemicals, 22 were injured and 2 were killed.[30]

Children were located in 8 of the 46 laboratories detected in South Australia in 2003.[31] Incidents of children being found in clandestine labs is concerning. enHealth suggests that there are "possibly … *hundreds per year*" of children at risk from contaminants from detected laboratories is dwarfed by the potential from undetected locations. [32]

Based on contaminant level and exposure studies in Australia and New Zealand it is likely that a reasonable proportion of children and adults exposed to clandestine laboratories will suffer at least minor behavioural, psychological or physiological health effects. The frequency and severity will increase with the nature, level and duration of such exposure.[33]

With the majority of the sites being in residential areas, it is a compounding issue for communities where laboratories have previously existed or currently exist. Other locations where detections have located laboratories include in motor vehicles, in motels and in commercial/industrial precincts further exacerbating the issue of site contamination.[34]

The United Nations guidelines for managing the disposal of chemicals used in illicit manufacture of drugs identifies that if schools or homes are within 100m of a laboratory, it may be necessary to:

- Temporarily move people/residents away from the location, particularly while chemicals are being removed.
- Undertake processes to identify if the laboratory is still operational and the type, condition and quantity of chemicals on site are necessary when remediating sites.
- Establishing if any chemical reactions are occurring is also recommended along with the creation of a management plan for the disposal of chemicals that seeks minimal movements of the them. [35]

[29] Caldicott et al, p161
[30] Ibid
[31] ibid, p159
[32] enHealth, p4
[33] Ibid
[34] Ibid, p159
[35] United Nations Office on Drugs and Crime, *Illustrated guide for the Disposal of Chemicals used in the Illicit manufacture of drugs, 2017,* p3

Further, the identification of chemical hazard classes should be observed and relocation processes need to consider the impacts if chemicals mix and react. [36]

Hazardous chemicals produced in clandestine laboratories include:

- Hydrochloric Acid – produces a toxic gas that burns your lungs and causes thyroid damage, is extremely corrosive, damages eyesight, and can cause respiratory failure.
- Methylamine – also extremely corrosive and lengthy exposure causes damage to internal organs.
- Mercuric Chloride – a toxic heavy metal that damages the respiratory tract and causes pulmonary oedema.
- Anhydrous Ammonia
- Freon – a refrigerant that causes frostbite used as a chemical coolant and is used in the methamphetamine itself.
- Methonol – causes severe eye damage and may result in total blindness or even loss of the actual eye.
- Red Phosphorous – probably the most dangerous chemical used in manufacturing methamphetamines, it is extremely toxic and is the reason laboratories often explode when raided or misused.

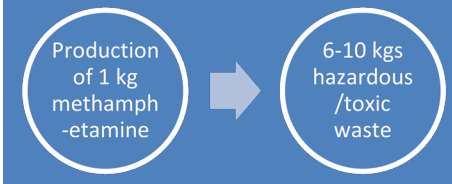
All of these chemicals can result in respiratory complications, heart disease, respiratory failure, cancer, and a variety of other disorders.[37]

Chemical vapours may be present from laboratories and can be a significant safety risk. It is critical that sites have ventilation and air flow established.[38]

enHealth[39] identified that while there had been a decline in both illicit drug incidence and detections of clandestine drug laboratories, the risks associated with clean up of sites used for drug manufacturing remains high. enHealth echoed the findings of Caldicott et all from 2005 some thirteen years later in their 2018 report identifying that there remained ill-defined procedures and

POSSIBLE OUTCOMES FROM CLANDESTINE LABORATORIES

- Dumping into household drains may create chemical reactions remote from the lab sites
- Hoarding of chemicals increases risks to "cooks" and first responders
- By-products result in a range of chemicals which can result in respiratory complications, heart disease, respiratory failure, cancer and a variety of other disorders
- Phosphine production - probably the most dangerous by-product is a highly toxic systemic poison that can result in death from delayed pulmonary oedema



Source: Caldicott et al 2005

[36] Ibid, p21
[37] Amphetamines.com, https://amphetamines.com/types/methamphetamine/5-dangers-of-meth-labs-that-you-should-know-about/ . Accessed March 2019
[38] Ibid, p5
[39] enHealth, 2017, p4

lack of understanding of long term impacts on property and health of those working in the laboratories or living near by contaminated sites.

Major risk to the public of the clandestine laboratories is exposure to methylamphetamine exposure, exacerbated by its persistent production residue attributes. [40] From the initial detection through to remediation processes, anyone entering a contaminated site where a clandestine laboratory operated/is operating should wear maximum personal protective equipment (PPE). [41] A risk, particularly to first responders, is that when sites are discovered, the responder may not be wearing adequate PPE given the level of protection required.[42]

Caldicott et al notes that increased police monitoring of sales of laboratory equipment has led to improvisation, including the "*adaption of items such as pressure cookers to produce steam for distillation, the use of light bulbs for flasks, or bottles for vapour traps and condensers*". All of which have a high risk of failure and potential release of chemicals. Theft of equipment from schools and universities was also identified as a fall out from the operation of clandestine drug laboratories.[43]

Accessing sites can be challenging and sites used for laboratories are usually protected. Guard dogs and in some cases booby traps to prevent access have been identified.[44]

Environmental impacts

The greatest risks are associated with sites that are still active, due to the release of contaminants into the air. Potential fire and explosion are other key risks from active sites. However, in San Diego, reports of fires erupting 10 years after the dumping of red phosphorous had occurred illustrates the long term impacts of clandestine laboratories that need to be managed.[45]

Potential contamination issues are identified to include:

- Premises used for laboratories with damaged or unformed floors can allow leaching of chemicals into soil.
- Disposal of chemicals from laboratories into household drains or into waterways (some laboratories have even been discovered on boats) may result in chemical reactions and the creation of toxic materials remote from the laboratory site.
- Hoarding of precursors and reagents increases the risks to both cooks and first responders.
- Sodium hydroxide is a main waste product and it will corrode containers over time with leaching into ground water possible.
- If the process of production is based on red phosphorous/hydriodic acid based procedures care is needed in handling the red phosphorous. While it is more stable and less toxic than

[40] Ibid
[41] United Nations, p4
[42] Caldicott et al, p 161
[43] Ibid, p157
[44] Ibid, p159
[45] Ibid

white phosphorous, the conversion of red phosphorous to white phosphorous is possible if poor handling or exposure to heat/light occurs. White phosphorous may react spontaneously in air to produce phosphoric acid or phosphine gas.

- Phosphine may also be produced if mixtures of red phosphorous with ephedrine hydrochloride and iodine/hydriodic acid are allowed to dry.
- Phosphine is a highly toxic systemic poison and death occurs by delayed pulmonary oedema. It has minimal odour and irritation making detection difficult. If in high concentration, it is explosive.
- Death to live stock who have access to contaminated sites or waterways.[46]

The long term impacts in environmental terms of clandestine laboratories has identified for every kilogram of methamphetamine an estimated 6-10 kilograms of hazardous or toxic waste is produced.[47] Traces of chemicals can pervade the walls, drapes, carpets, and furniture of a laboratory site making the contamination a long term or enduring issue for future site uses.

Care in the location for disposal of on site chemicals is needed. Observation of the avoidance buffer zones in local land use planning guidelines and other guidance materials should be considered, including proximity to waterways, fields where stock graze, areas of agricultural production or urban areas when determining sites for chemical disposal.

The need for gases as inputs in production processes can see manufacture of gas occurring on site rather than risking alerting authority's via purchased cylinders. Caldicott et al identifies that in the case of hydrogen chloride gas, onsite production can sometimes result in storage under pressure in inappropriate vessels prone to corrosion and structural failure.[48]

Attempts to protect laboratory locations can lead to the splitting of production over various sites.[49] This creates more environmental impact issues as the number of sites relating to one laboratory multiply and may require remediation.

Vehicles were identified in 12.5% of the detected laboratory locations in 2016-17.[50] This is the second most prevalent location type identified and presents the additional potential environmental potential threat of dumping of chemicals/by products in multiple locations. The production of drugs in such a confined space also adds to the likely health impacts on those involved in the production process.

[46] Ibid
[47] Ibid
[48] Ibid
[49] Ibid, p 158
[50] Australian Criminal Intelligence Commission, "Illicit Drug Data Report, 2016-17", July 2018, p 117

Impacts on animals

Animals exposed to clandestine laboratories can suffer side effects demonstrated in neurological signs including:

- Agitation
- Hyperactivity
- Irritability
- Aggression
- Apprehension.

Ingestion of large doses of illicit drugs or exposure to harmful fumes may present as severe respiratory depression. Chemical burns from fires or explosions, along with dermatologic contact with the drug on feet or hair may also occur. [51]

[51] The Drug Crisis and the Potential Impact on Animalshttp://invma.org/wp-content/uploads/sites/5/2017/08/Drugs-and-animals-One-Welfare-Sept-2017.pdf. Accessed March 2019

Selected bibliography

1. Al-Obaidi, T.A. and Fletcher, S.M. – *Management of clandestine drug laboratories: need for evidence based environmental health policies.* Environmental Health and Preventative Medicine, January 2014 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3890076. Accessed March 2019.
2. Amphetamines.com – *5 dangers of meth labs* - https://amphetamines.com/types/methamphetamine/5-dangers-of-meth-labs-that-you-should-know-about/. Accessed March 2019.
3. Australian Criminal Intelligence Commission- *Illicit Drug Data Report 2016/17,* published September 2018. Accessed March 2019 Source: https://www.acic.gov.au/publications/intelligence-products/illicit-drug-data-report-0,
4. Batsinger, G., *Coping with meth lab hazards,* https://ohsonline.com/Articles/2006/11/Coping-with-Meth-Lab-Hazards.aspx, 2006, OHS online. Accessed March 2019.
5. Caldicott DGE, Pigou, P.E., Beattie, R. and Edwards, J.W - *Clandestine drug laboratories in Australia and the potential harm*. Australian and New Zealand journal of public health, 2005, Vol29 No: 2, pp 155-162.
6. Crime Statistics Australia, *"Drug monitoring in Australia – trends in alcohol and other drug use, 2007-2016"* – July 2018 Source: http://www.crimestats.aic.gov.au/DUMA/1_trends/#overallTrends. Accessed March 2019.
7. Department of Health (Western Australia) – *Clandestine drug laboratories (Clan labs),* https://ww2.health.wa.gov.au/~/media/Files/Corporate/general%20documents/Clandestine%20drug%20labs/PDF/Clandestine-drug-laboratories-brochure-joint-DOH-WA-Police.pdf. Accessed March 2019
8. enHealth *Guidance on: Clandestine Drug Laboratories and Public Health Risks* , January 2017, https://www.health.gov.au/internet/main/publishing.nsf/content/A12B57E41EC9F326CA257BF0001F9E7D/$File/Guidance-Clandestine-Drug-Laboratories-Public-Health.pdf. Accessed March 2019.
9. Goldsmid, S. and Willis, M. - *Methamphetamine use and acquisitive crime: Evidence of a relationship,* Australian Institute of Criminology trends and Issues, No 516, October 2016 ISSN: 0817- 8542**.** Accessed March 2019.
10. Indiana Veterinary Medical Association - *The Drug Crisis and the Potential Impact on Animals*, http://invma.org/wp-content/uploads/sites/5/2017/08/Drugs-and-animals-One-Welfare-Sept-2017.pdf. Accessed March 2019
11. Karlsson, A. and Burns, L., *Australian Drug Trends 2017: Findings from the Illicit Drug Reporting System (IDRS)*, Australian Drug Trends Series No. 181, National Drug and Alcohol Research Centre, University of New South Wales, 2018
12. Payne, J. and Gaffney, A. - *How much rime is drug or alcohol related? Self -reporting attributions of police detainees,* trends and issues in crime and criminal justice, Australian Institute of Criminology, No, 439, May 2012.
13. Payne, J., Macgregor, S. and McDonald, H. – *Homelessness and housing stress among police detainees: results from the DUMA program,* Trends and issues in crime and criminal justice, Australian Institute of Criminology No. 492, February 2017
14. United Nations Office on Drugs and Crime – *Disposal of Chemical used in the illicit manufacture of drugs,* 2017
15. Schloenhardt, A. *The Market for amphetamine-type stimulants and their precursors in Oceania.* Research and public policy series No. 81. Canberra: Australian Institute of Criminology. https://aic.gov.au/publications/rpp/rpp81, 2007