REPORT 25

NATIONAL WASTEWATER DRUG MONITORING PROGRAM

AUSTRALIAN CRIMINAL INTELLIGENCE COMMISSION

THE UNIVERSITY OF QUEENSLAND AUSTRALIA

Adelaide University

CONTENTS

CEO FOREWORD

I am pleased to present Report 25 of the Australian Criminal Intelligence Commission's National Wastewater Drug Monitoring Program (the Program).

This report includes new data collected from December 2024 to October 2025. In August 2025 the Program covered 57% of the Australian population. Wastewater analysis continues to provide a clear, objective view of illicit drug consumption across Australia. These findings are critical to inform insights on, and responses to, Australia's illicit drug markets which are supplied by serious and organised crime (SOC) groups. The latest data shows consumption for some drugs monitored by the Program has increased, reinforcing that demand remains strong and that SOC groups continue to find ways to supply our markets, despite law enforcement disruption to their activity.

Australia's major illicit drug markets continue to demonstrate sustained growth. In Year 9 of the Program, consumption of methylamphetamine, cocaine, heroin and 3,4-methylenedioxymethylamphetamine (MDMA) continued to increase, with a record combined weight of 26.8 tonnes consumed nationally between August 2024 and August 2025. This amounts to a 21 % combined increase from the previous year – with the following increases individually methylamphetamine 23%, cocaine 17%, MDMA 20% and heroin 23%.

Importantly, this growth follows already significant increases across all four drug types as reported in the Program report released in August 2025.

The record national methylamphetamine consumption is of concern given the significant community harms the drug causes. We also have high per capita use of methylamphetamine in global terms, where in 2024 we ranked second highest compared with 33 other countries who participate in the Sewage Core Group Europe (SCORE), outlined in Section 3 of the report. Cocaine and heroin consumption was also at a record high.

The estimated street value of the methylamphetamine, cocaine, MDMA and heroin consumed between August 2024 and August 2025 also hit a record high at $14.3 billion. Methylamphetamine continued to account for the greatest proportion of the combined total at $11.05 billion (77%).

What is increasingly apparent is the resilience of these markets. SOC groups can operate across jurisdictions, commodities and supply chains with a level of cohesion and sophistication. Some SOC groups are leveraging existing importation and distribution pathways to move into higher demand, higher return commodities. This reflects a broader pattern of diversification, where the same groups are extending into new markets as opportunities emerge.

In environments such as this, coordination is critical. Wastewater data provides a shared evidence base that supports the alignment of priorities and a clearer focus on the groups contributing to the greatest harm. Its value is greatest when combined with other data and intelligence to build a comprehensive picture.

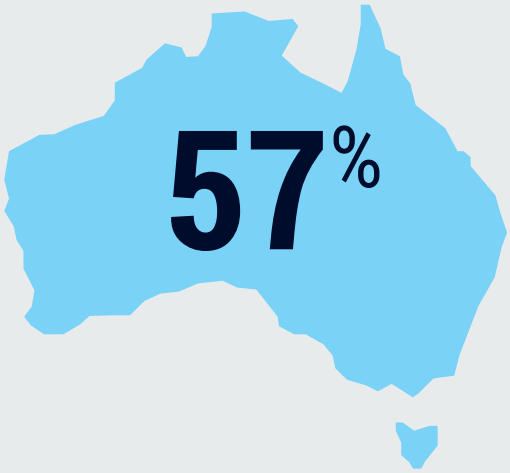
This report contributes to a shared understanding of the national threat environment and supports coordinated efforts to disrupt the groups causing harm in the Australian community.

ACKNOWLEDGEMENTS

I would like to acknowledge the valuable support and expertise of The University of Queensland and Adelaide University, which undertook the data collection and analysis underpinning this report, and the ACIC officers who contributed to the project.

Heather Cook
Chief Executive Officer
Australian Criminal Intelligence Commission

SNAPSHOT



The August 2025 collection covers around **57 per cent** of Australia's population – about **14.5 million Australians**.

RECORD HIGHS

December 2024

KETAMINE
capital city and regional

August 2025

METHYLAMPHETAMINE
capital city and regional

COCAINE
regional

October 2025

COCAINE
capital city

HEROIN
capital city

LIKELY FUTURE TRENDS

There is potential for further increases in **methylamphetamine** and **cocaine** consumption. **Heroin** consumption continues to fluctuate and there are indications that consumption of **MDMA** may have plateaued.

FURTHER INCREASE

FLUCTUATION

PLATEAUED

Methylamphetamine

8,405 kg
9,847 kg
11,516 kg
11,147 kg
8,838 kg
9,018 kg
10,585 kg
12,815 kg
15,791 kg

Cocaine

3,057 kg
4,115 kg
4,636 kg
5,675 kg
4,711 kg
3,385 kg
4,037 kg
6,835 kg
7,985 kg

MDMA

1,251 kg
1,162 kg
2,226 kg
2,630 kg
1,231 kg
723 kg
962 kg
1,430 kg
1,711 kg

Heroin

830 kg
750 kg
941 kg
1,021 kg
984 kg
1,077 kg
999 kg
1,137 kg
1,397 kg

LEGEND

- **Year 1** (2016–17)
- **Year 2** (2017–18)
- **Year 3** (2018–19)
- **Year 4** (2019–20)
- **Year 5** (2020–21)
- **Year 6** (2021–22)
- **Year 7** (2022–23)
- **Year 8** (2023–24)
- **Year 9** (2024–25)

Estimated state and territory annual consumption of methylamphetamine, cocaine, MDMA and heroin for Year 9 of the Program.

Methylamphetamine

ACT	155.1 kg
NSW	4,622.4 kg
NT	109.9 kg
QLD	3,230.9 kg
SA	1,425.8 kg
TAS	255.9 kg
VIC	3,846.0 kg
WA	2,145.6 kg
NATIONAL	15,791 kg

Cocaine

ACT	140.7 kg
NSW	3,287.2 kg
NT	42.4 kg
QLD	1,644.9 kg
SA	422.6 kg
TAS	60.9 kg
VIC	2,073.7 kg
WA	313.1 kg
NATIONAL	7,985 kg

MDMA

ACT	14.3 kg
NSW	761.9 kg
NT	29.2 kg
QLD	313.5 kg
SA	80.5 kg
TAS	35.2 kg
VIC	360.1 kg
WA	116.4 kg
NATIONAL	1,711 kg

Heroin

ACT	22.2 kg
NSW	626.7 kg
NT	1.8 kg
QLD	134.8 kg
SA	36.3 kg
TAS	5.5 kg
VIC	501.9 kg
WA	68.1 kg
NATIONAL	1,397 kg

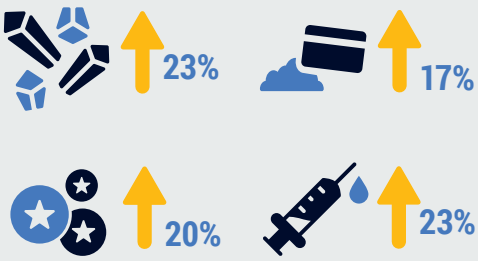
YEAR 9 TRENDS

Between Year 8 and 9 of the Program (August 2024 to August 2025) total estimated consumption of **methylamphetamine**, **cocaine**, **MDMA** and **heroin** increased by 4.6 tonnes, or 21 per cent of the combined weight.

MARKET IMPACTS:

Consumption of **methylamphetamine**, **cocaine**, **MDMA** and **heroin** increased 23%, 17%, 20% and 23% respectively.

INCREASE



MARKET VALUE:

The estimated street value of the 4 drugs in Year 9 was a record **$14.3 billion**, up from $11.5 billion in Year 8.

INTERNATIONAL DRUG CONSUMPTION COMPARISONS 2024

METHYLAMPHETAMINE

consumption in Australia ranked **2nd of 34** SCORE* countries

COCAINE

consumption in Australia ranked **24th of 34** SCORE* countries

MDMA

consumption in Australia ranked **12th of 33** SCORE* countries

CANNABIS

consumption in Australia ranked **7th of 26** SCORE* countries

*SCORE – Sewage Core Group Europe covering Europe, North and South America and Oceania.

INTRODUCTION

The National Wastewater Drug Monitoring Program (the Program) presents data on Australia's drug consumption for 12 substances, including methylamphetamine, cocaine, heroin and 3,4-methylenedioxymethylamphetamine (MDMA), among a range of other illicit and licit substances.

The Program assists in understanding drug use within populations, providing a measure of the demand for a range of drugs. Illicit drugs and licit drugs with abuse potential are inherently harmful and reliable drug consumption data are a key indicator of levels of community harm. The ACIC partners with the universities of Queensland and Adelaide (formerly the University of South Australia) to deliver the Program.

Findings presented in wastewater reports provide law enforcement, policy, regulatory and health agencies with objective data on drug use. These data create opportunities to shape responses to the demand and supply sides of illicit drug markets, particularly in high-use areas, and can inform harm reduction strategies. They inform priority-setting that is responsive to constantly evolving drug markets domestically and internationally.

Longitudinal data captured by the Program increase our understanding of drug use nationally, in specific locations and over time. They provide valuable insight into trends and emerging issues in drug consumption across Australia and can identify new sources of risk. Further details about the drugs tested and program reporting are outlined below.

AUSTRALIAN DRUG MARKETS: STATE OF PLAY

Program data provides unambiguous evidence that several of Australia's most significant illicit drug markets continue to expand. In particular, in the 12 months ending in August 2025 all jurisdictions recorded increased consumption of methylamphetamine and cocaine to the highest levels recorded by the Program since it commenced in 2016. Heroin consumption increased substantially in some jurisdictions, with 5 recording the highest consumption levels recorded by the Program. The results for MDMA consumption were mixed across jurisdictions.

For methylamphetamine there has been an overall increasing trend in consumption nationally since August 2021. For cocaine, the trend commenced in August 2022. For MDMA the trend commenced in April 2022, however consumption has decreased since December 2024. In the case of heroin, a trend of general increase commenced in April 2023, but consumption has varied since December 2024.

The domestic trends are understandable in the context of global dynamics. For the past several years the world has seen record levels of cultivation and manufacture of cocaine and methylamphetamine, particularly from traditional source countries in the Americas and Asia. In the case of methylamphetamine, this is augmented by supplies from other source countries and sometimes sophisticated domestic manufacture. The Australian heroin market is supplied by relatively high-quality product, almost exclusively from South-East Asia. Restrictions imposed by the Taliban in Afghanistan on opium cultivation are not impacting the Australian market because Afghanistan is not a major source country for the Australian heroin market. There are indications that MDMA is being manufactured in Asia as well as Europe (and to a lesser extent in Australia) and this has potential

implications for the Australian market. Australia's demand for the 4 major drugs represents a very small component of the quantity of these drugs which is produced annually around the world. For the foreseeable future reliable supplies to Australia of high quality methylamphetamine, cocaine, MDMA and heroin is a given and there is potential for further increases in methylamphetamine and cocaine consumption. There are indications that consumption of MDMA may have plateaued and heroin consumption has fluctuated during 2025.

The intent and capability of SOC groups to service the Australian methylamphetamine, cocaine, MDMA and heroin markets is very high. Criminal groups are geographically dispersed across the world. Their resilience and sophistication challenges methods of disruption used by intelligence and law enforcement agencies globally. Much of the illegal activity perpetrated by these criminal groups is related to Australia's highly profitable drug markets. Data in this report reinforce what the ACIC, law enforcement and departments of health have been indicating for some time on the basis of operational activity and treatment and forensic data in their respective jurisdictions—that Australia has plentiful supplies of methylamphetamine and cocaine in particular.

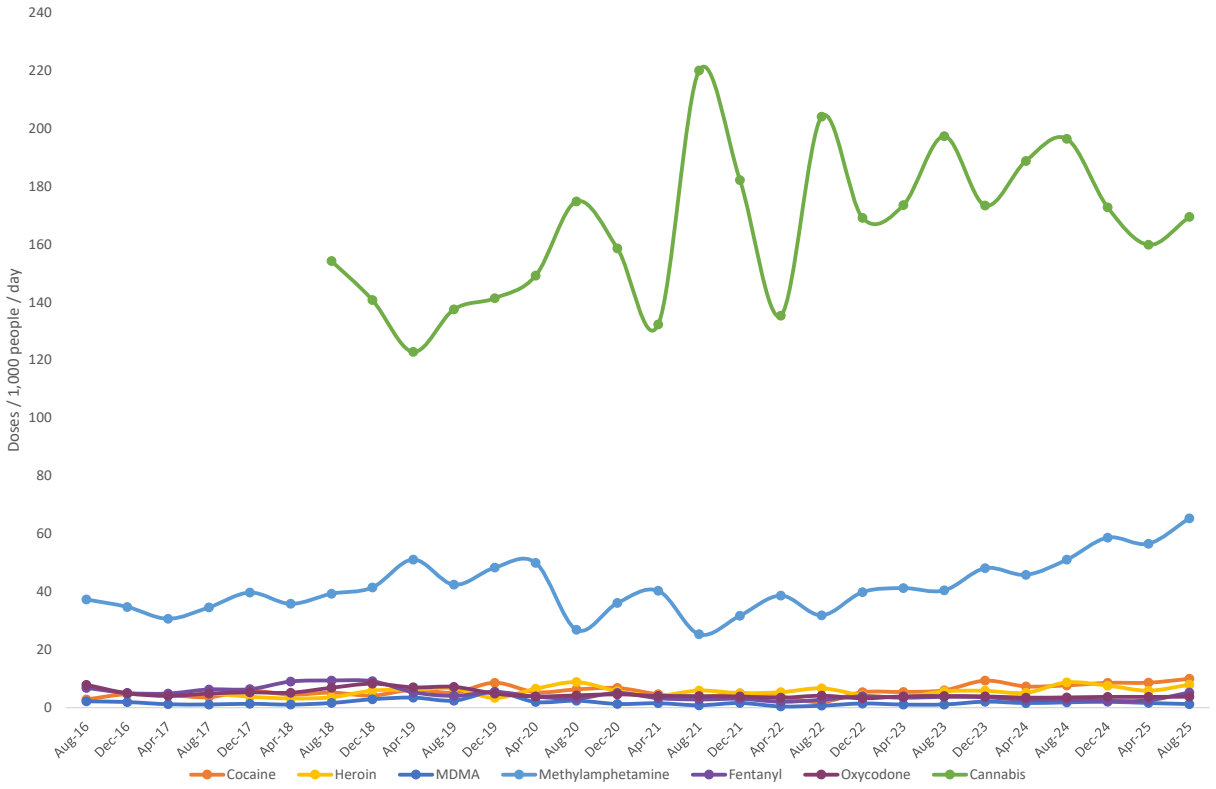
Australia's National Drug Strategy 2017–26 is based on the 3 pillars of supply, demand and harm reduction. SOC was estimated to have cost Australia up to $82.3 billion in 2023–24, with illicit drugs accounting for almost a quarter ($19.0 billion). Demand for the major drugs is resilient and difficult to address. This will continue while Australian drug users choose to consume these substances and to pay premium prices in world terms for the drugs. Unlike heroin, for which there are opioid replacement therapy options available, it is widely recognised that effective pharmacotherapy treatment options for dependent users of methylamphetamine are limited. This creates challenges in addressing market demand.

DRUG CONSUMPTION SNAPSHOT

Average consumption of nicotine increased in both capital cities and regional areas between August 2024 and August 2025, with nicotine consumption increasing 4% nationally. For alcohol, average consumption decreased in capital cities between August 2024 and August 2025 and increased in regional areas.

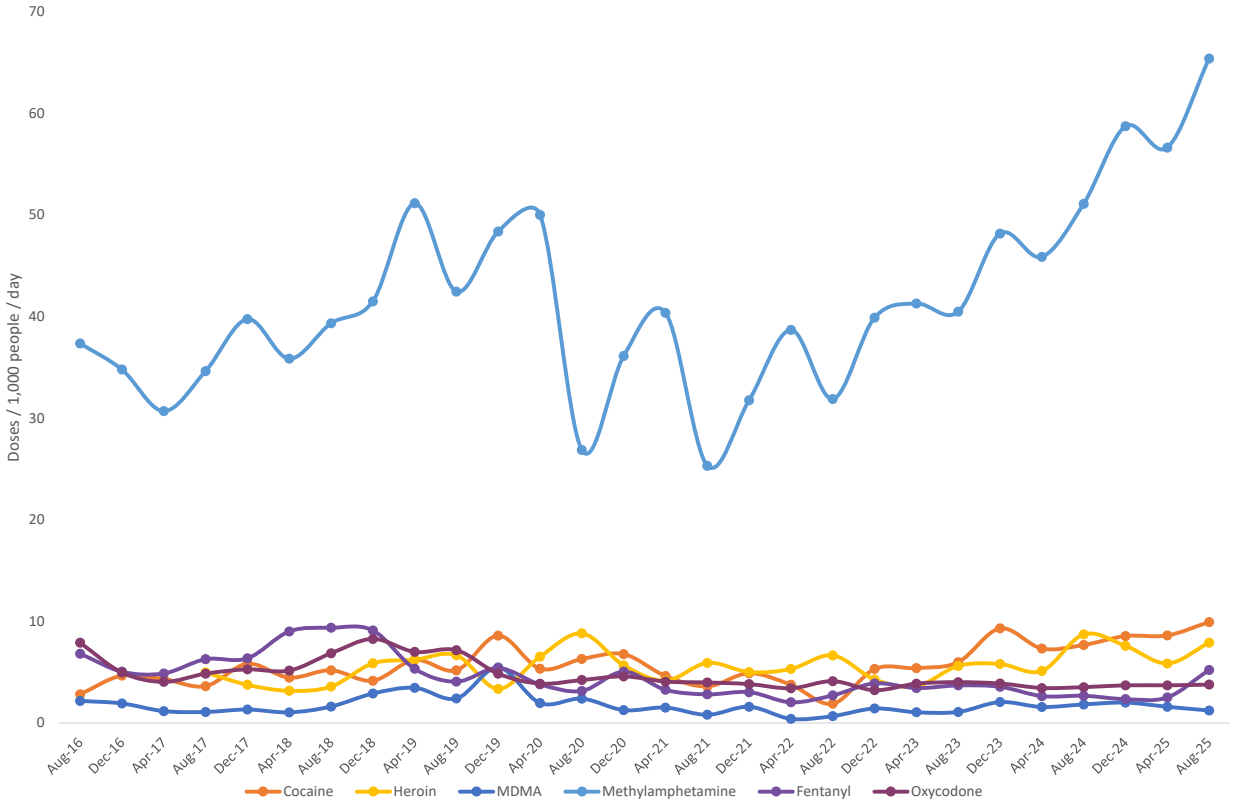
Nicotine and alcohol aside, cannabis is the most consumed drug by a large margin, despite substantial fluctuations (Figure 1). Cannabis consumption in August 2025 decreased from the previous August.

Figure 1: National average drug consumption of cannabis, methylamphetamine, cocaine, MDMA, heroin, oxycodone and fentanyl.



Methylamphetamine consumption increased and is at record levels. (Figures 1 and 2). Cocaine consumption also increased to a record level; however it remains substantially lower than methylamphetamine. MDMA consumption increased between August and December 2024, then decreased to August 2025 (Figure 2). Heroin consumption has fluctuated over the period. Of the pharmaceutical opioids, oxycodone consumption remained relatively stable, with fentanyl consumption increasing in August 2025 (Figure 2).

Figure 2: National average drug consumption of methylamphetamine, cocaine, MDMA, heroin, oxycodone and fentanyl.



A 9 YEAR RETROSPECTIVE

With the passage of 9 years, sufficient data have now been collected by the Program to permit deep longitudinal analysis of consumption trends. Moreover, Program data have proven amenable to analysis from a variety of perspectives, including highlighting differences at the national versus regional levels, and differences in consumption between city and regional settings.

Throughout the life of the Program, national consumption of nicotine and alcohol far exceeded consumption of all other substances monitored. Moreover, cannabis consumption has exceeded by some margin consumption of all other illicit drugs.

As revealed in this Program report (2024-25), total national consumption of methylamphetamine, cocaine, MDMA and heroin was 26.8 tonnes, the highest combined weight recorded since the Program commenced in 2016.

The combined estimated national consumption of methylamphetamine, cocaine, MDMA and heroin increased 21% during the year to August 2025. This amounts to a 4.6 tonne increase in consumption from the year prior, driven by increases in all 4 drugs (Table 1). Methylamphetamine accounted for approximately 59% of the combined estimated consumption of these 4 drugs in the reporting period. By way of comparison, the next most consumed illicit stimulant, cocaine, accounted for approximately 30% of the combined consumption. The 15.7 tonnes of methylamphetamine, 7.9 tonnes of cocaine and 1.3 tonnes of heroin are record high estimated levels of consumption since the Program commenced.

Table 1. Estimated annual methylamphetamine, cocaine, MDMA and heroin consumption, as total weight consumed nationally, Year 1 to Year 9 of the Program.

Drug	Estimated consumption (kilograms per annum)									% Change
	Year 1 2016–17	Year 2 2017–18	Year 3 2018–19	Year 4 2019–20	Year 5 2020–21	Year 6 2021–22	Year 7 2022–23	Year 8 2023–24	Year 9 2024–25	Year 8 to Year 9
Meth	8,405	9,847	11,516	11,147	8,838	9,018	10,585	12,815	15,791	↑ 23
Cocaine	3,057	4,115	4,636	5,675	4,711	3,385	4,037	6,835	7,985	↑ 17
MDMA	1,251	1,162	2,226	2,630	1,231	723	962	1,430	1,711	↑ 20
Heroin	830[a]	750	941	1,021	984	1,077	999	1,137	1,397	↑ 23
Total	**13,543**	**15,874**	**19,319**	**20,473**	**15,764**	**14,203**	**16,583**	**22,217**	**26,884**	↑ **21**[b]

a. Heroin estimates for Year 1 are based on one collection period.

b. This figure is not a summation of percentage change entries in this column, it represents the percentage difference in total consumption between Years 8 and 9 of the Program.

Program data also show fluctuating consumption over time for the drugs covered by the Program, including record high and low consumption of various drugs at different times since August 2016, emphasising that illicit drug markets do not operate in a consistent manner. However, there has been limited change over the life of the Program in the hierarchy of consumption of the 4 major illicit drugs. The only change that has occurred in the hierarchy over the life of the Program has been heroin overtaking MDMA in Years 6 and 7.

VALUE OF DRUGS CONSUMED

Using Program consumption data and the most recent national median price data available to the ACIC, it is possible to calculate the overall estimated street value of the major illicit drugs. In Year 9 (2024–25) the total market value of the 4 major illicit drugs of concern increased from $11.5 billion to a record $14.3 billion (Table 2). The methylamphetamine market, which has the highest value of the 4 drug types and where consumption increased by 23%, accounted for the majority of that expenditure, amounting to $11.05 billion (77% of the total estimated expenditure).

Table 2. Estimated street value of annual methylamphetamine, cocaine, MDMA and heroin consumption for Year 1 to 9 of the Program.

Drug	Street value ($A)								
	Year 1 (A$) 2016–17	Year 2 (A$) 2017–18	Year 3 (A$) 2018–19	Year 4 (A$) 2019–20	Year 5 (A$) 2020–21	Year 6 (A$) 2021–22	Year 7 (A$) 2022–23	Year 8 (A$) 2023–24	Year 9 (A$) 2024–25
Meth	7.24b	7.38b	8.63b	6.96b	7.95b	8.34b	10.58b	8.97b	11.05b
Cocaine	1.06b	1.54b	2.08b	1.41b	1.88b	1.10b	1.31b	2.22b	2.79b
MDMA	145.59m	114.19m	211.08m	226.72m	95.50m	62.32m	99.51m	147.93m	174.52m
Heroin	207.50m	375.00m	423.45m	382.87m	418.20m	538.50m	449.55m	284.25m	349.25m
Total	**8.6b**	**9.4b**	**11.3b**	**8.9b**	**10.3b**	**10.0b**	**12.4b**	**11.5b**	**14.3b**

ESTIMATED STATE AND TERRITORY CONSUMPTION

At the state and territory level, consumption of methylamphetamine and cocaine increased in all jurisdictions in Year 9 to the highest levels recorded by the Program. Trends in consumption of MDMA and heroin varied (Tables 3 to 6). There were varying changes in methylamphetamine consumption across jurisdictions, with the estimated weight consumed in New South Wales increasing by almost a tonne and in Queensland by 720 kilograms. The estimated weight of cocaine consumed in Year 9 in New South Wales increased 500 kilograms. Consumption of MDMA varied nationally in Year 9, with decreased consumption in Victoria, Tasmania and the Australian Capital Territory. While heroin consumption decreased in the Australian Capital Territory, there was record consumption in 5 other jurisdictions.

Table 3. Estimated methylamphetamine consumption per jurisdiction in Year 1 to Year 9 of the Program.

Jurisdiction	Estimated consumption (kilograms per annum)									% Change
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 8 to Year 9
ACT	80.3	93.0	119.4	122.1	93.2	83.2	93.9	118.9	155.1	30
NSW	2,298.3	2,604.5	3,337.4	3,409.7	2,877.0	2,912.3	3,290.9	3,624.7	4,622.4	28
NT	65.5	75.5	84.8	66.6	54.7	50.1	52.8	80.6	109.9	36
Qld	1,277.5	1,893.3	2,247.7	2,246.8	1,608.8	1,650.7	1,953.8	2,509.4	3,230.9	29
SA	1,005.3	1,159.5	943.2	980.5	838.5	775.9	938.6	1,124.4	1,425.8	27
Tas	92.0	127.1	177.1	155.0	88.5	99.3	134.7	185.9	255.9	38
Vic	2,039.2	2,477.7	3,124.6	2,980.2	2,307.9	2,502.2	2,798.6	3,455.2	3,846.0	11
WA	1,547.3	1,416.8	1,482.7	1,186.2	969.9	944.8	1,322.3	1,716.4	2,145.6	25

Table 4. Estimated cocaine consumption per jurisdiction in Year 1 to Year 9 of the Program.

Jurisdiction	Estimated consumption (kilograms per annum)									% Change
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 8 to Year 9
ACT	67.8	81.2	83.4	113.9	91.9	54.0	63.1	116.4	140.7	21
NSW	1,812.3	2,397.8	2,548.0	2,988.2	2,374.5	1,622.9	1,933.7	2,784.6	3,287.2	18
NT	19.0	27.4	22.8	20.9	12.4	7.6	9.7	31.2	42.4	36
Qld	319.4	576.6	714.1	918.5	845.3	570.1	705.1	1,402.4	1,644.9	17
SA	107.1	129.2	173.1	243.8	170.5	160.2	201.8	367.8	422.6	15
Tas	10.9	15.5	16.6	26.8	35.1	29.2	24.5	50.7	60.9	20
Vic	676.5	819.9	968.0	1,216.0	1,083.9	860.6	974.4	1,846.5	2,073.7	12
WA	43.9	67.9	110.0	147.0	98.3	80.7	124.8	235.6	313.1	33

Table 5. Estimated MDMA consumption per jurisdiction in Year 1 to Year 9 of the Program.

Jurisdiction	Estimated consumption (kilograms per annum)									% Change	
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 8 to Year 9	
ACT	28.4	14.4	36.5	38.6	17.8	6.5	10.5	14.5	14.3	↓	-1
NSW	462.8	450.5	834.7	986.1	446.1	234.2	334.0	511.8	761.9	↑	49
NT	37.8	24.1	32.4	46.4	32.1	13.7	8.5	16.3	29.2	↑	79
Qld	216.5	223.2	502.4	627.6	301.3	189.3	195.8	290.4	313.5	↑	8
SA	56.5	66.6	70.8	127.8	79.6	26.8	38.6	52.2	80.5	↑	54
Tas	30.6	16.7	54.9	54.1	31.0	12.4	22.8	36.0	35.2	↓	-2
Vic	319.6	291.3	511.9	479.0	232.0	194.3	285.1	398.5	360.1	↓	-10
WA	99.0	74.9	182.4	271.3	91.5	46.6	66.9	110.3	116.4	↑	6

Table 6. Estimated heroin consumption per jurisdiction in Year 1 to Year 9 of the Program.

Jurisdiction	Estimated consumption (kilograms per annum)									% Change	
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 8 to Year 9	
ACT	14.7	15.3	10.3	16.9	15.3	17.3	22.6	26.1	22.2	↓	-15
NSW	264.6	222.2	307.0	323.9	356.9	389.6	366.4	444.4	626.7	↑	41
NT	1.0	1.0	1.0	1.4	1.6	1.1	1.0	1.2	1.8	↑	50
Qld	65.5	66.2	66.4	77.7	84.8	100.5	82.0	97.1	134.8	↑	39
SA	47.8	34.8	30.5	41.8	37.5	34.7	28.5	31.2	36.3	↑	16
Tas	3.3	4.5	2.8	4.3	5.4	3.2	3.1	5.1	5.5	↑	8
Vic	402.1	359.4	469.7	464.4	424.4	479.3	456.0	474.2	501.9	↑	6
WA	31.1	46.8	53.8	91.4	58.7	51.4	40.0	58.4	68.1	↑	17

a. Annual heroin consumption estimates for Year 1 are informed by data from only one collection period.

IMPLEMENTATION

The ACIC contracted The University of Queensland, and through it Adelaide University, to deliver the Program. Relationships have been built between the universities and the operators of wastewater facilities across Australia to permit collection and analysis of samples.[1]

In this report, Program wastewater analysis measured the presence[2] of the following substances:

- methylamphetamine
- amphetamine
- cocaine
- 3,4-methylenedioxymethylamphetamine (MDMA)
- 3,4-methylenedioxyamphetamine (MDA)
- heroin
- cannabis
- oxycodone
- fentanyl
- nicotine
- alcohol
- ketamine.

The ACIC continues to review the range of monitored substances with its partners, stakeholders and universities.

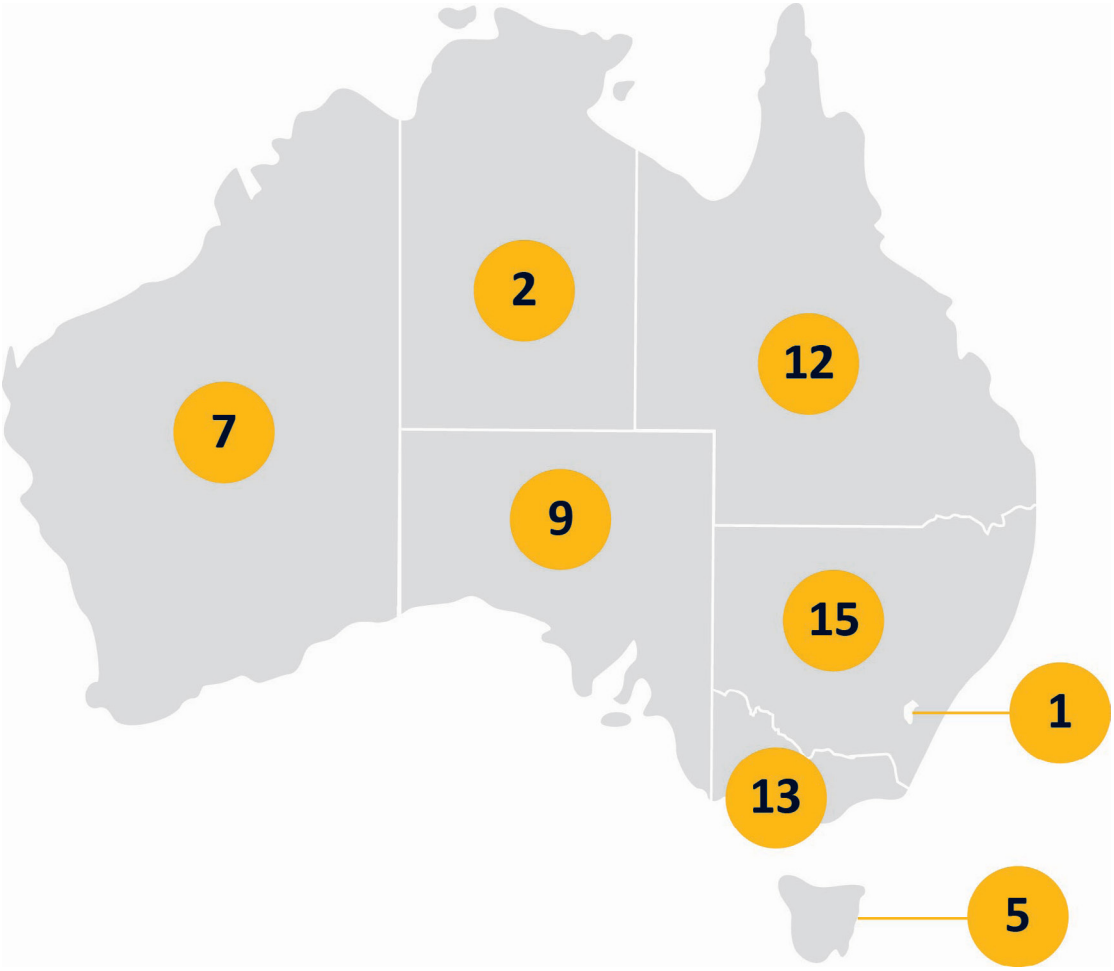
Both contracted universities monitor wastewater across Australia, covering all state and territory capital cities and a range of regional cities and towns. In August 2025, 64 wastewater treatment plants participated nationally, covering 57% of the Australian population (Figure 3).[3] Sites were selected to permit the ACIC to provide data on major population areas, to represent a cross-section of regional cities and towns and sites where treatment plant operators have established relationships with the universities.

1 Errors/variation within the extraction and analysis methods exist for each drug type and across sampling locations, but are usually less than ±10%.

2 The contract recognises that threshold levels are substance dependent and will vary accordingly. Refer to the research findings for further information on detection levels and whether it was possible to measure all substances.

3 Sampling also occurred in October 2025 in capital city sites, with 18 participating wastewater sites nationally, covering approximately 44 per cent of the Australian population.

Figure 3: Breakdown of sites by jurisdiction for August 2025.



Participation by all states and territories is vital to informing our understanding of the national picture of drug use and demand. Although the location of sites within and between states and territories may change over the life of the Program, the intention is to ensure site continuity.

REPORTING

In accordance with current wastewater analysis conventions, the terms of the contract and to protect the integrity of the Program, the exact locations of wastewater treatment plants sampled are not publicly released by the ACIC. Stakeholders in law enforcement, health and other relevant policy agencies are provided with classified information identifying actual sampling locations to inform appropriate responses.

Reported results reflect per capita use in all locations and, with the exception of MDMA and ketamine (for which reliable dose figures are unavailable), are expressed in terms of both the number of doses and the weight or volume consumed per capita of the respective substances, to facilitate comparison between substances.

INTERNATIONAL COMPARISONS

The Program is based on a well-established, internationally recognised methodology. Wastewater-based epidemiology has been standardised by a European network of laboratories focussed on quality sampling and analysis called the Sewage Core Group Europe (SCORE). The SCORE network facilitates an annual inter-laboratory testing program among participating laboratories that research and measure illicit drugs in wastewater across the globe. As part of this routine laboratory benchmarking, participating laboratories which pass analytical criteria are invited to submit 7 days of wastewater data for their region in roughly the same time period, thus ensuring the quality of the analysis and comparability of reported data. The research teams at The University of Queensland and Adelaide University have taken part in and passed this testing regime for more than 6 years. As the methods are standardised internationally, this allows for the comparison of data between countries. Every batch of samples that is analysed domestically is subjected to 3 levels of quality controls comprising known amounts of authentic reference drug standards. These are analysed in duplicate to ensure accuracy and reproducibility. With substantial coverage (>50 sites), the estimates in Australia are derived from a large proportion of the population and regular geographically diverse sampling.

The SCORE network permits comparison between analytical results obtained from countries in Europe, Oceania, North and South America. These results confirm the considerable per capita consumption of illicit stimulants in Australia, even in world terms, and that our illicit stimulant consumption is dominated by methylamphetamine.

EXPLOITATION OF PROGRAM DATA

Program data provide an important basis for the development of empirically-informed government and private sector policy and decision making. The reports provide unambiguous and detailed measures of the level of demand for the listed substances in the Australian population, complementing other drug datasets published in Australia.

Wastewater data are also particularly useful for identifying differences in levels of drug consumption in capital cities and regional areas of Australia. The data reinforces different dynamics that apply to both capital city and regional markets and illustrate drug consumption variations that exist within and between states and territories. Understanding these preferences is important in the development and delivery of national responses and in tailoring responses to suit the specific needs of individual jurisdictions. Wastewater analysis also permits the ACIC to gain insight into the decision-making of SOC groups that supply illicit drug markets.

Wastewater reporting enables the ACIC and partners to detect and respond to increasing drug threats. The number and diversity of regional sites that participate in the Program permit confident assessments to be made of drug trends outside of the capital cities that can be used to inform local responses. This is important because it allows wastewater data to complement a number of other Australian drug data collections that have limited regional coverage or are confined to capital cities. It also permits the ACIC and partners to speak with greater confidence about local drug threats.

Triangulated data show that domestic drug markets are complex and vary between jurisdictions, with external influences affecting markets in different ways at different time periods. Other Program data illustrate that consumption of the respective drugs also varies considerably at different sites within jurisdictions. It is important that Australian drug datasets are interpreted holistically.

When considering the whole spectrum of market indicators, the combined picture indicates concerning growth nationally, including in the markets for illicit stimulants.

When coupled with seizure and detection data (both onshore and offshore), wastewater data provide an important indicator of the collective capacity and intentions of SOC groups. Also, demand is best understood at a population level and wastewater data lends itself to this. The level of drug consumption is the best and most reliable indicator of total illicit drug market size, noting that there may be short-term unmet demand, especially where drugs are largely (for example, methylamphetamine) or exclusively (cocaine and heroin) imported.

The ACIC engages with academic institutions, industry and public sector agencies to identify further data applications. Identified opportunities included informing responses in high-risk areas; measuring drug use in specific local areas; estimating the size of discrete illicit markets; and exploring options for monitoring the effectiveness of existing demand, supply and harm reduction initiatives. The Program is sufficiently flexible to allow for bespoke collection activity in different geographic locations and at varying intervals in response to identified needs and objectives.

BENEFITS OF THE PROGRAM

Wastewater data are an important part of the national suite of datasets that increase understanding of drug consumption, demand and supply in Australian cities and regional locations. This report builds on national drug consumption data contained in preceding reports to identify trends over more than 9 years of drug use across states, territories and the nation.

The ACIC's wastewater work extends far beyond the Program. We and our university partners continue to innovate and to generate additional applications for wastewater analysis. Moreover, wastewater analysis now routinely extends to a broader range of drugs than is reported in the Program for research and development purposes, which aids future understanding of emerging drug market issues and responses.

RESEARCH FINDINGS

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LIST OF ABBREVIATIONS

ABS	Australian Bureau of Statistics
ACIC	Australian Criminal Intelligence Commission
ACT	Australian Capital Territory (capital city is Canberra)
DASSA	Drug and Alcohol Services South Australia
LC-MS/MS	Liquid chromatography tandem mass spectrometry
LOD	Limit of detection
LOQ	Limit of quantification
MDA	3,4-methylenedioxyamphetamine
MDMA	3,4-methylenedioxymethylamphetamine
NSW	New South Wales (capital city is Sydney)
NT	Northern Territory (capital city is Darwin)
NWDMP	National Wastewater Drug Monitoring Program
Qld	Queensland (capital city is Brisbane)
SA	South Australia (capital city is Adelaide)
SPE	Solid phase extraction
Tas	Tasmania (capital city is Hobart)
THC	Tetrahydrocannabinol, active substance in cannabis
THC-COOH	11-nor-9-carboxy-tetrahydrocannabinol, metabolite of THC
Vic	Victoria (capital city is Melbourne)
WA	Western Australia (capital city is Perth)
WWTP	Wastewater treatment plant

TERMINOLOGY

Methylamphetamine is also commonly known as methamphetamine. In this report methylamphetamine is used, consistent with the preferences of the ACIC.

MDMA is commonly known as ‘ecstasy’.

Alcohol consumption in this report refers to ethanol consumption, but the more general term alcohol is used throughout.

Nicotine consumption has replaced tobacco consumption as the target metabolites may also be derived from nicotine replacement products, such as gums and patches.

THC and THC-COOH: Tetrahydrocannabinol is the main psychoactive compound in cannabis and is referred to as THC throughout this report. Cannabis consumption levels have been calculated from the THC metabolite, 11-nor-9-carboxy-tetrahydrocannabinol (THC-COOH).

1: INTRODUCTION

BACKGROUND

Wastewater analysis is a technique for monitoring the population-scale consumption of substances. The Australian Criminal Intelligence Commission (ACIC) National Wastewater Drug Monitoring Program (NWDMP) has reported on substances of concern in Australia since August 2016. The NWDMP focuses on 12 licit and illicit drugs: nicotine (consumption of tobacco products, gums, patches and e-cigarettes/vapes), ethanol from alcohol consumption, pharmaceuticals with abuse potential such as oxycodone, fentanyl, and ketamine, as well as the illicit substances methylamphetamine, amphetamine, MDMA (ecstasy), MDA, cocaine, cannabis and heroin. Estimates of drug consumption in a population are determined from measured concentrations of drug metabolites in wastewater samples. Results are used to monitor trends in drug consumption over the life of the Program.

The wastewater treatment plants (WWTPs) located across capital cities and regional Australia in all states and territories have been invited to participate in the Program. The report presents patterns of substance consumption across Australia, showing differences in levels between capital cities and regional centres, within and between states and territories and nationally. Sites have been given a unique number which is used in every report. Site names and locations are not included in the report to maintain the confidentiality of participating treatment plants, so only 3-digit site codes are presented in the results. Each state has been assigned a background colour to identify them in graphs (Figure 4). More detailed data collection methods are described in Appendix 4.

The University of Queensland and Adelaide University have provided the wastewater data from 2016 to the present, with 3 reports delivered to the ACIC per year. Previously the ACIC released 3 public reports each year, but in 2025 decided to transition to a single annual public report which will provide detail on consumption trends over the preceding 12-month period. Samples continue to be collected at wastewater treatment plants for one week every 2 months for sites in capital cities and for one week every 4 months for regional sites. The aim is to provide consumption estimates for substances that cause potential harm, either through addiction, health risks, or criminal and anti-social behaviour.

DATA IN THIS REPORT

This report compares consumption data from previous reports with results obtained from wastewater samples collected for up to 7 days in regional and/or capital city sites in December 2024 and February, April, June, August and October 2025. The December, April and August collections involved regional and capital city sites, while February, June and October included capital city sites only. Between 56 and 64 sites participated in collections from December 2024 to October 2025, with up to 22 capital cities and 42 regional sites represented (Table 7). Total population coverage ranged from 11.9 to 12.4 million people in February, July and October 2025 when only capital city samples are collected, representing between 46% and 48% of the Australian population. For December 2024, April and August 2025 when regional areas and capital cities were sampled, population coverage was between 13.1 to 14.5 million people, representing between 51% and 57% of the Australian population.

A total of 1,611 new samples have been added to the 12,269 previously collected up to October 2024, bringing the total number since the beginning of the Program to 13,880. The samples provide national data on drug consumption and build on prior results to provide trends between locations and over time. The number of participating sites for this report and a complete list of participating sites, number of samples and relative catchment sizes are listed in Table 7 and Appendix 2. Due to the large number of data bars included in each annual report, we have added a visual aid (an upside-down triangle) to indicate where the new data added in this report begins (applicable to sections 2.2 to 2.4). Each state and territory in this report has an assigned colour in figures (see Figure 4).

Figure 4: Participating WWTPs in August 2025 showing the number of capital city and regional sites by state and territory. Each state or territory is assigned a colour which is used to identify them in figures.

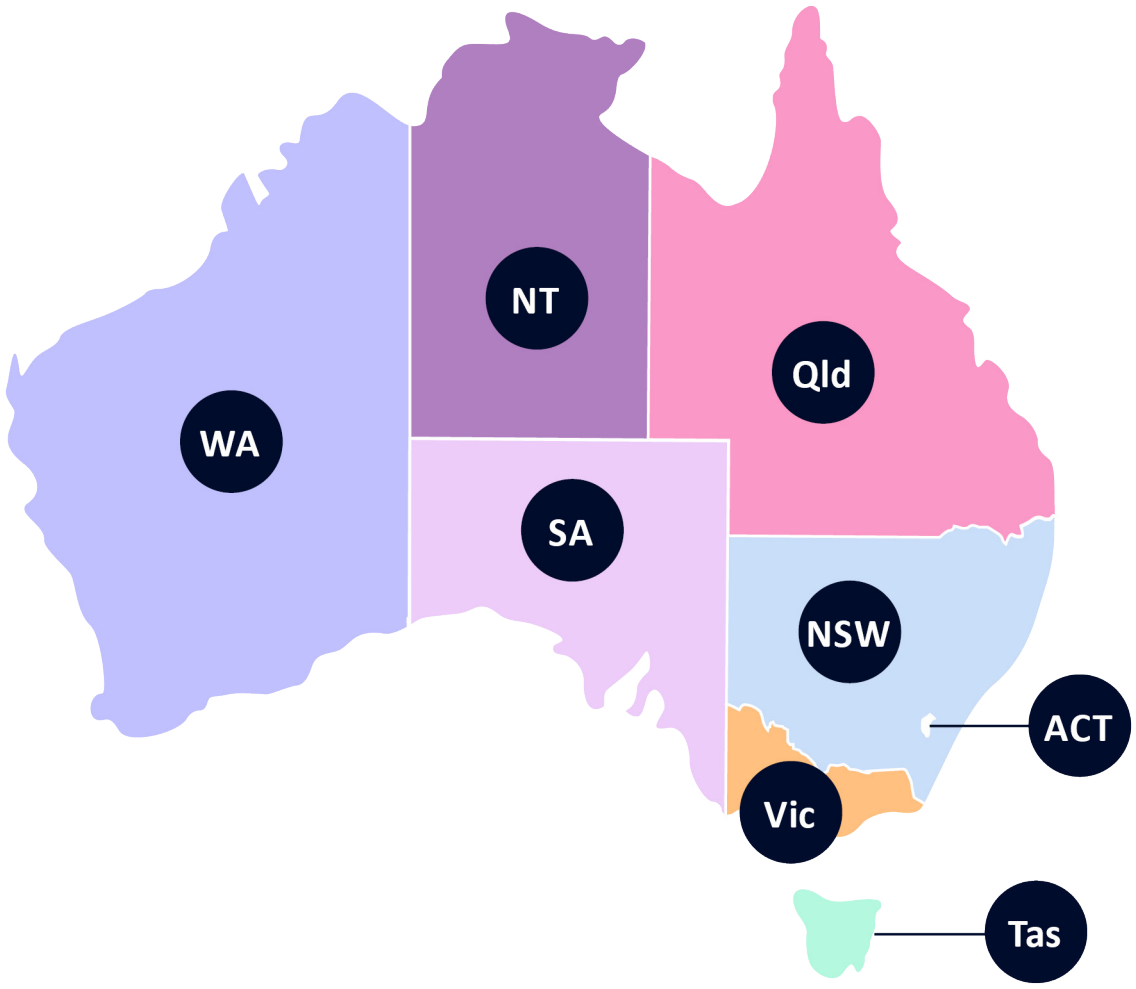


Table 7: Number of participating WWTPs for the periods covered in this report. December, April and August include data from both capital city (C) and regional (R) sites, while February, June and October include data from capital city sites only.

State/territory	Dec 2024 Capital	Dec 2024 Reg.	Feb 2025 Capital	Apr 2025 Capital	Apr 2025 Reg.	Jun 2025 Capital	Aug 2025 Capital	Aug 2025 Reg.	Oct 2025 Capital
ACT	1	–	1	1	–	1	1	–	1
NSW	3	8	3	3	7	3	5	10	3
NT	1	1	1	1	1	1	1	1	1
Qld	3	9	3	2	9	3	3	9	2
SA	4	5	4	4	5	4	4	5	3
Tas	3	2	3	3	2	3	3	2	3
Vic	2	11	2	2	11	2	2	11	2
WA	3	4	3	2	3	3	3	4	3
Sites	**20**	**40**	**20**	**18**	**38**	**20**	**22**	**42**	**18**
Population (millions) C & R	**12.1**	**2.1**	**12.1**	**11.1**	**2.0**	**12.1**	**12.4**	**2.1**	**11.1**
% of Australian population	**47.6**	**8.3**	**47.6**	**43.7**	**7.9**	**47.6**	**48.8**	**8.3**	**43.7**
Total population (millions)	**14.2**		**12.1**	**13.1**		**12.1**	**14.5**		**11.1**
% of Australian population	**55.9**		**47.6**	**51.5**		**47.6**	**57.0**		**43.7**

Estimates have been rounded to the nearest 0.1 million. Census 2021 population used (25,422,788) for population percentage estimates.

2: RESULTS

Estimated drug consumption data are presented differently in the following sections. Section 2.1 compares estimates from the individual sites collected in the collection periods December 2024, April and August 2025, while section 2.2 compares state or territory averages for the past 2 years and section 2.3 presents the long-term national average. Comparisons between drugs are shown within each state and territory in section 2.4. Methods of data collection can be found in Appendix 4. A list of the detection frequency for each drug can be found in Appendix 3.

2.1 SITE COMPARISON OF DRUG CONSUMPTION IN DECEMBER 2024 AND APRIL AND AUGUST 2025

December 2024 and April and August 2025 data were used to compare individual sites as they included the latest set of results for the full suite of regional and city sites. We recommend exercising caution when comparing results between sites as some sites provided samples for fewer days than others. The number of collection days can vary from 5 to 7, with sites in Tasmania unable to collect samples over the weekend. Additionally, it is not always possible to coordinate collection during the same week of the month at all sites, so sampling weeks may not correspond in all instances. Uncertainties in population estimates are likely to be higher for smaller sites (e.g. regional communities) or where large short-term population changes occur due to employment opportunities, tourism, or festival events. These uncertainties have less impact when data are averaged, for example at the state/territory or national level, reported in subsequent sections.

Note: The following graphs include average lines which represent the population-weighted average of the sites from the reporting period shown on the graph.

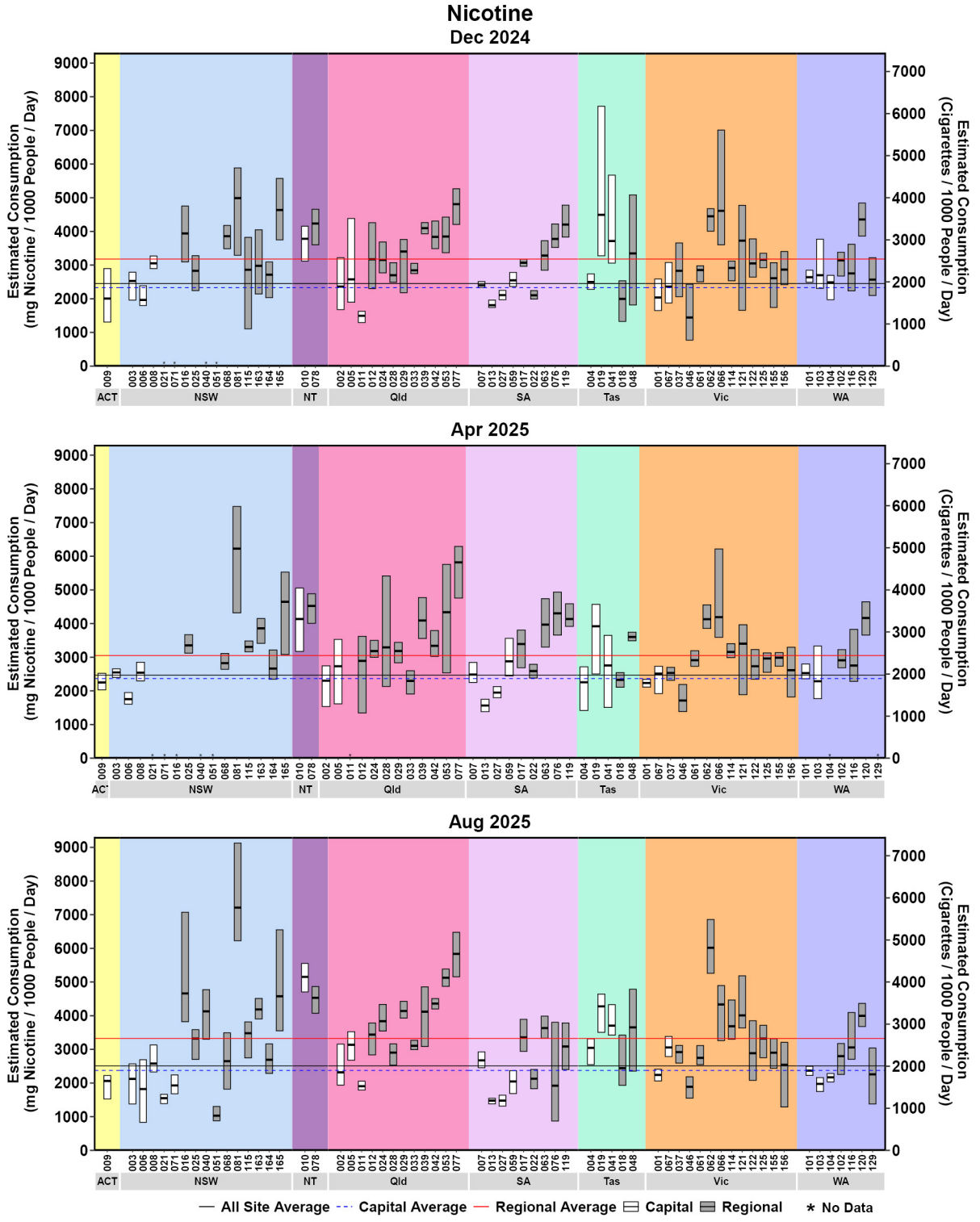
2.1.1 NICOTINE AND ALCOHOL

Nicotine is the main psychoactive substance present in tobacco leaves, some vaping products and nicotine replacement therapies used to facilitate cessation of smoking. Two nicotine metabolites, cotinine and hydroxycotinine, were used to estimate the consumption of nicotine. The estimate is expressed as nicotine in this report as the method cannot distinguish between nicotine from tobacco, e-cigarettes, or nicotine replacement therapies such as patches and gums.

The results show that national average nicotine consumption was higher in regional areas compared to capital cities across all 3 reporting periods (red horizontal and blue dotted lines, respectively (Figure 5). Some capital city sites in Darwin and Hobart tend to have above average nicotine consumption while a regional site in New South Waleshad the highest regional consumption.

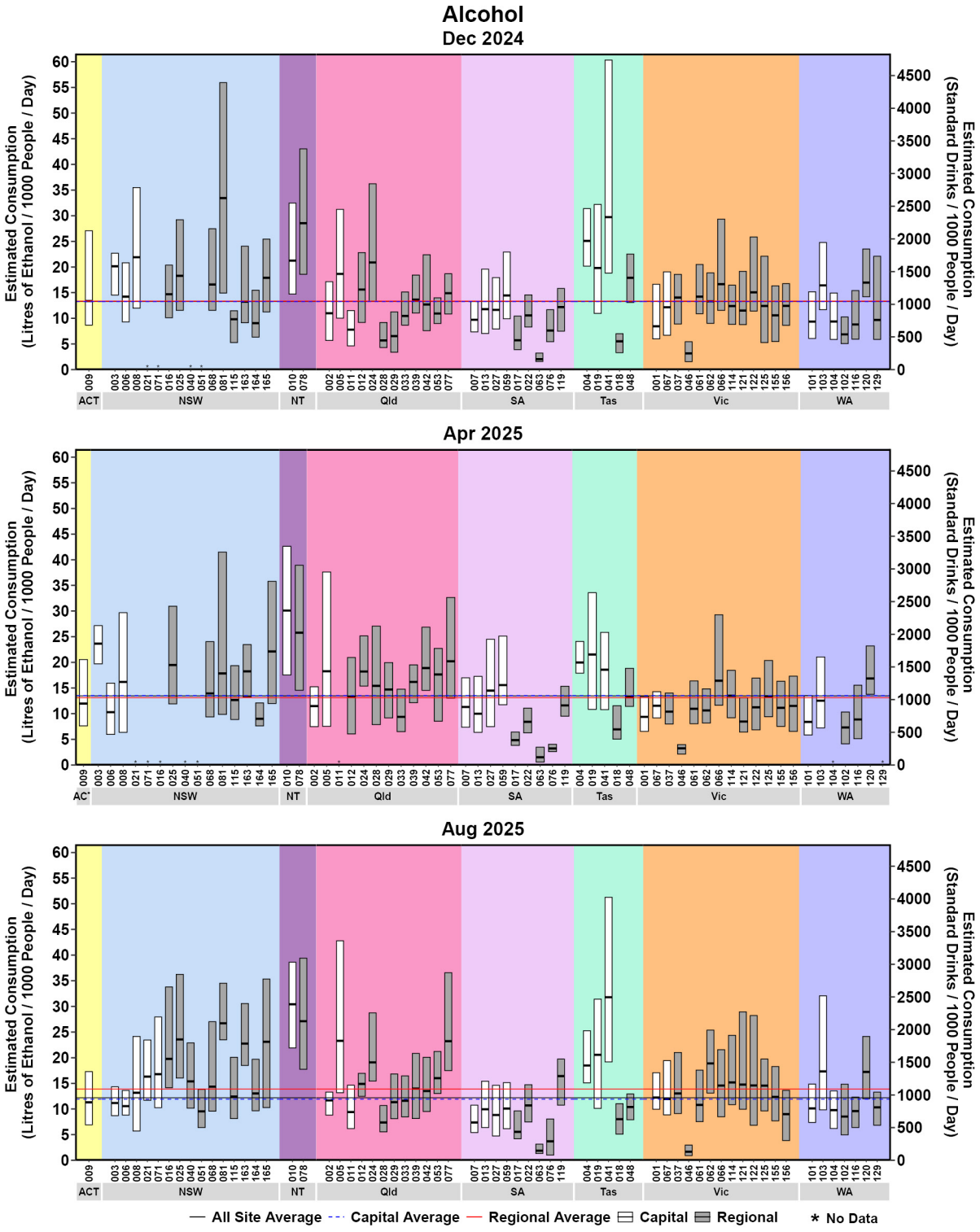
Alcohol consumption was determined using ethyl sulphate as the specific marker of ethanol. The difference in the average alcohol consumption between regional and capital city sites was small (Figure 6). Relatively large differences in alcohol consumption were evident between days of the collection week, which is typical for this substance. Sites in Hobart and Darwin had relatively high capital city alcohol. A regional site in each of South Australia, Tasmania and Victoria had well below average alcohol consumption.

Figure 5: Estimated nicotine consumption for December 2024, April 2025 and August 2025 in mass of nicotine consumed per day (left axis) and number of cigarettes per day (right axis) per thousand people.



- Higher average consumption in regional areas
- Large variation between sites

Figure 6: Estimated alcohol consumption for December 2024, April 2025 and August 2025 in litres consumed per day (left axis) and standard drinks per day (right axis) per thousand people.



- Large differences in consumption between days of the week
- Similar regional and capital city averages

2.1.2 STIMULANTS

2.1.2.1 METHYLAMPHETAMINE

Average methylamphetamine consumption was higher in regional areas across all 3 reporting periods (Figure 7). There was consistent relatively high methylamphetamine use across the same regional sites from several jurisdictions. Capital city use of the drug varied within a narrower range between sites compared to regional areas.

2.1.2.2 AMPHETAMINE

Amphetamine in wastewater can originate from medically prescribed lisdexamfetamine and dexamfetamine excretion or illicit use. However, it is also the main metabolite of methylamphetamine (Gracia-Lor et al. 2016). Considering the high average methylamphetamine consumption in most jurisdictions across Australia, it is not possible to attribute amphetamine loads in wastewater to specific drug taking behaviour. The measured concentration of amphetamine in the various samples mostly fell within a range which is consistent with the reported excretion rates following methylamphetamine consumption. The results broadly matched our previous findings (see Appendix 4 of Report 1). The proportion of amphetamine relative to methylamphetamine is increasing in some parts of the country, implying increased amounts of amphetamine consumption. It is recognised that amphetamine prescribing has increased in some jurisdictions due to increased diagnosis of conditions such as attention deficit hyperactivity disorder (ADHD) requiring therapeutic treatment with lisdexamfetamine and dexamfetamine. This is particularly the case in Western Australia.

2.1.2.3 COCAINE

Cocaine consumption was measured using its metabolite benzoylecgonine as the specific biomarker. The average consumption of cocaine was slightly higher in capital cities compared to regional areas (Figure 8). Some sites in Sydney, Melbourne and Brisbane had consistently high cocaine consumption, together with a regional site in New South Wales and Queensland. Sites in Western Australia and regional Northern Territory, Tasmania and South Australia had below average cocaine consumption.

2.1.2.4 MDMA (3,4-METHYLENEDIOXYMETHYLAMPHETAMINE)

The capital city average consumption of MDMA varied relative to average regional consumption but was similar to it across reporting periods (Figure 9). Sites in Sydney and Darwin had the highest capital city MDMA consumption, while sites in New South Wales and Queensland tended to have the highest regional consumption.

2.1.2.5 MDA (3,4-METHYLENEDIOXYAMPHETAMINE)

The results for MDA are expressed as excreted amounts (Figure 10). The national average MDA excretion for regional areas was similar to or higher than the national capital city average. Sites in Sydney, Hobart and Darwin had the highest capital city excretion levels, while regional sites in Victoria consistently had relatively high excretion levels. The results should be understood in the context of the relatively low MDA excreted amounts compared to the other stimulants.

Figure 7: Estimated methylamphetamine consumption for December 2024, April 2025 and August 2025 in mass consumed per day (left axis) and doses per day (right axis) per thousand people.

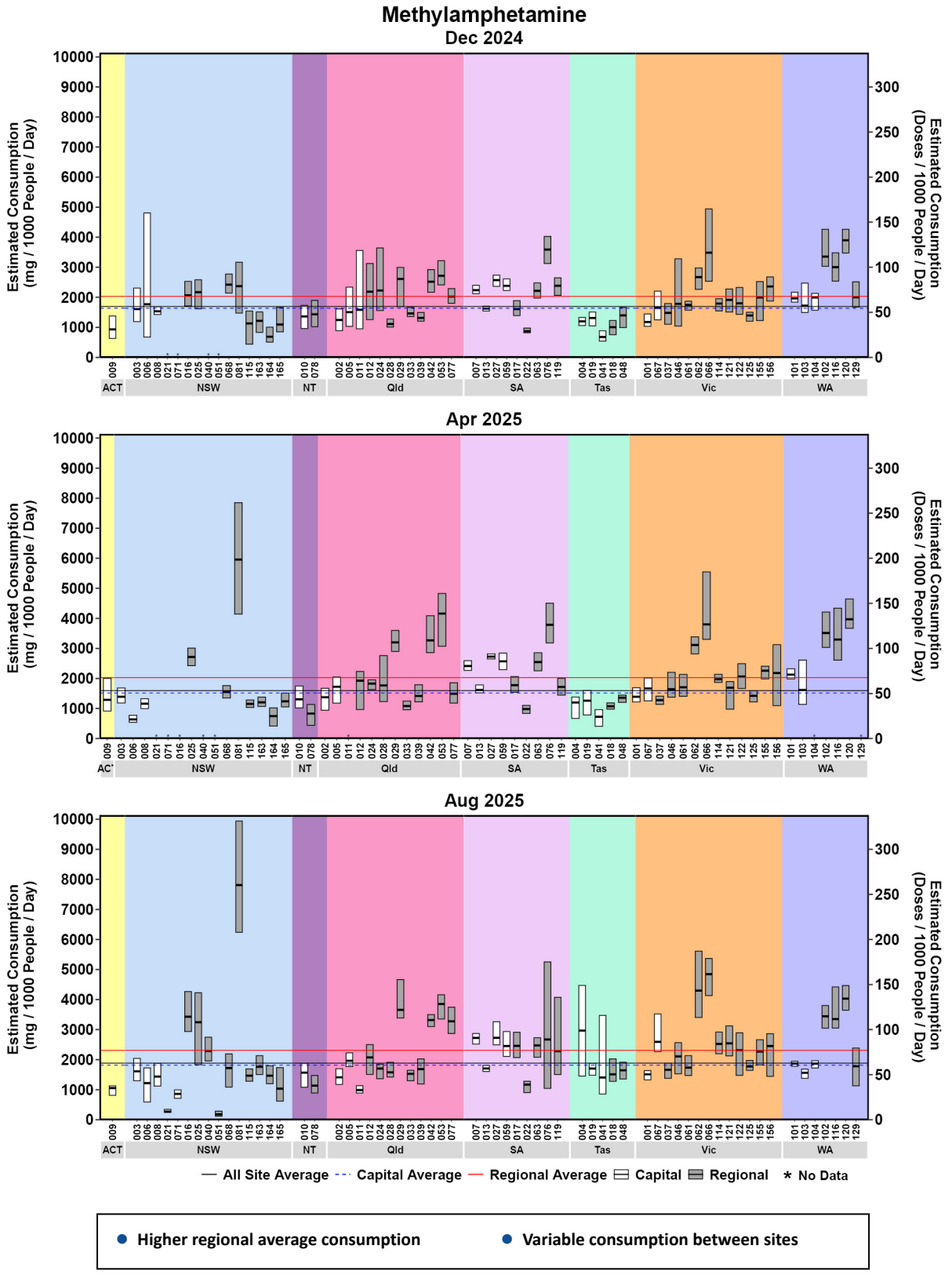


Figure 8: Estimated cocaine consumption for December 2024, April 2025 and August 2025 in mass consumed per day (left axis) and doses per day (right axis) per thousand people.

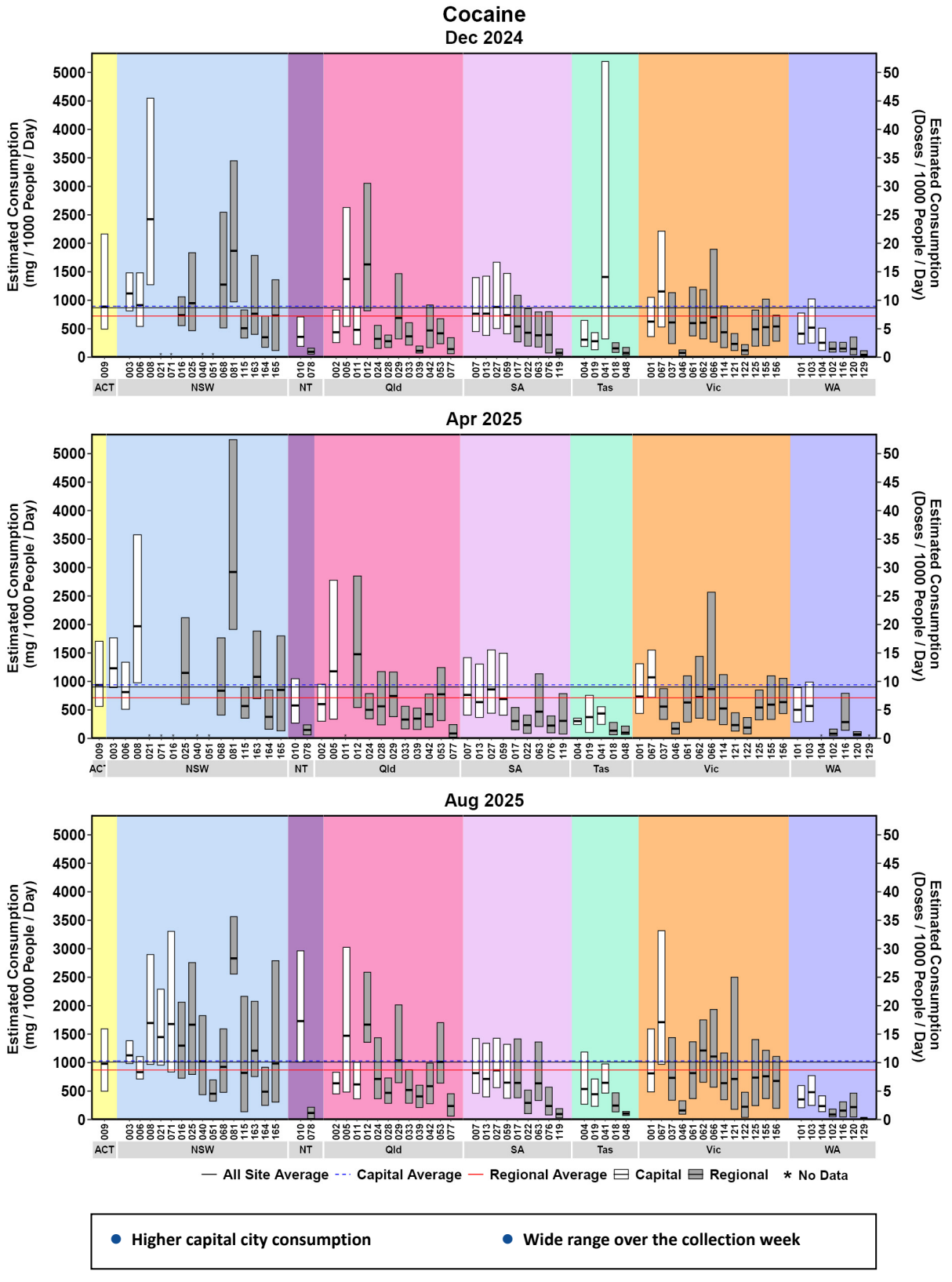


Figure 9: Estimated MDMA consumption for December 2024, April 2025 and August 2025 in mass consumed per day (left axis) and doses per day (right axis) per thousand people. Text describing the extreme values shown above the graph are based on the left y axis.

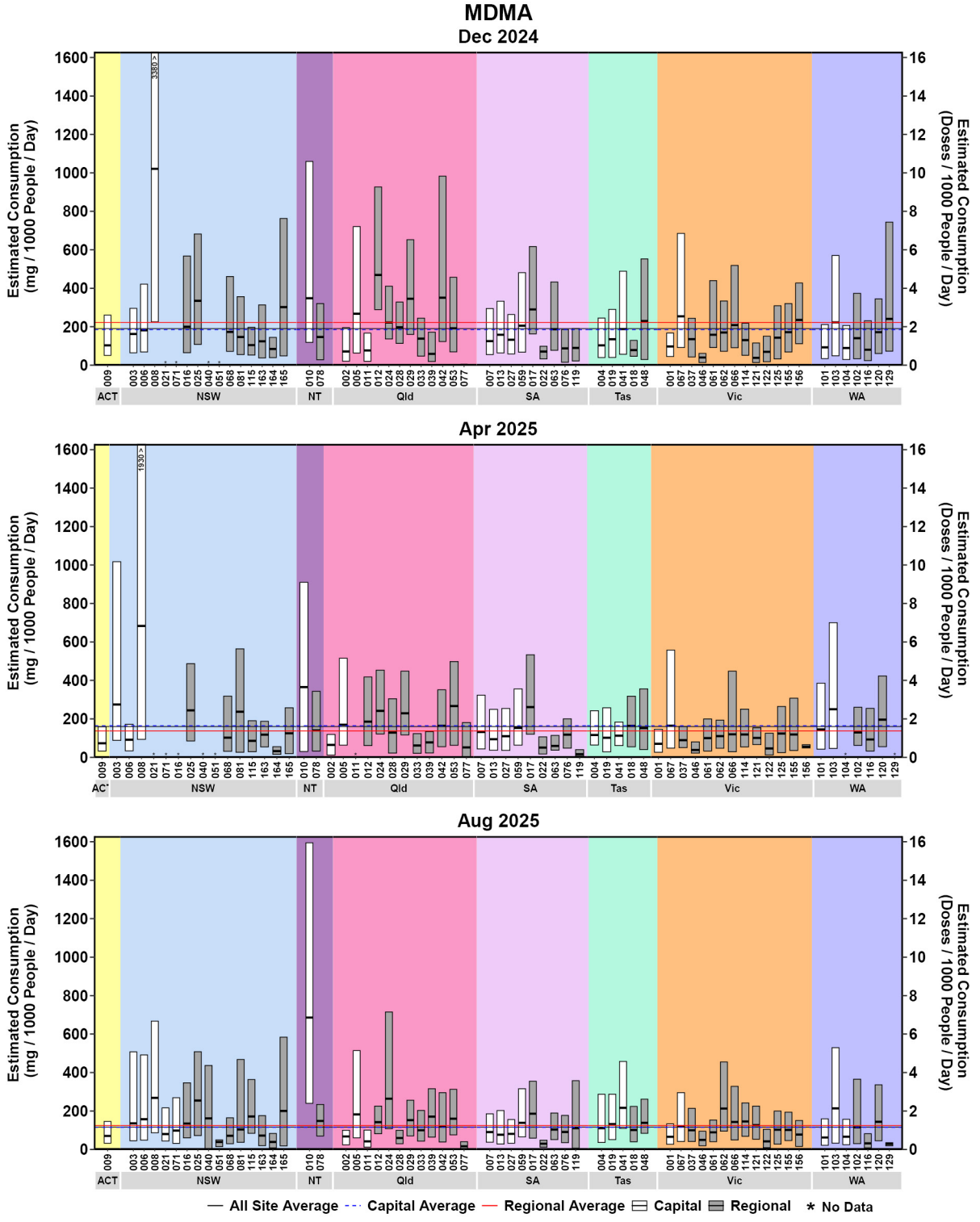
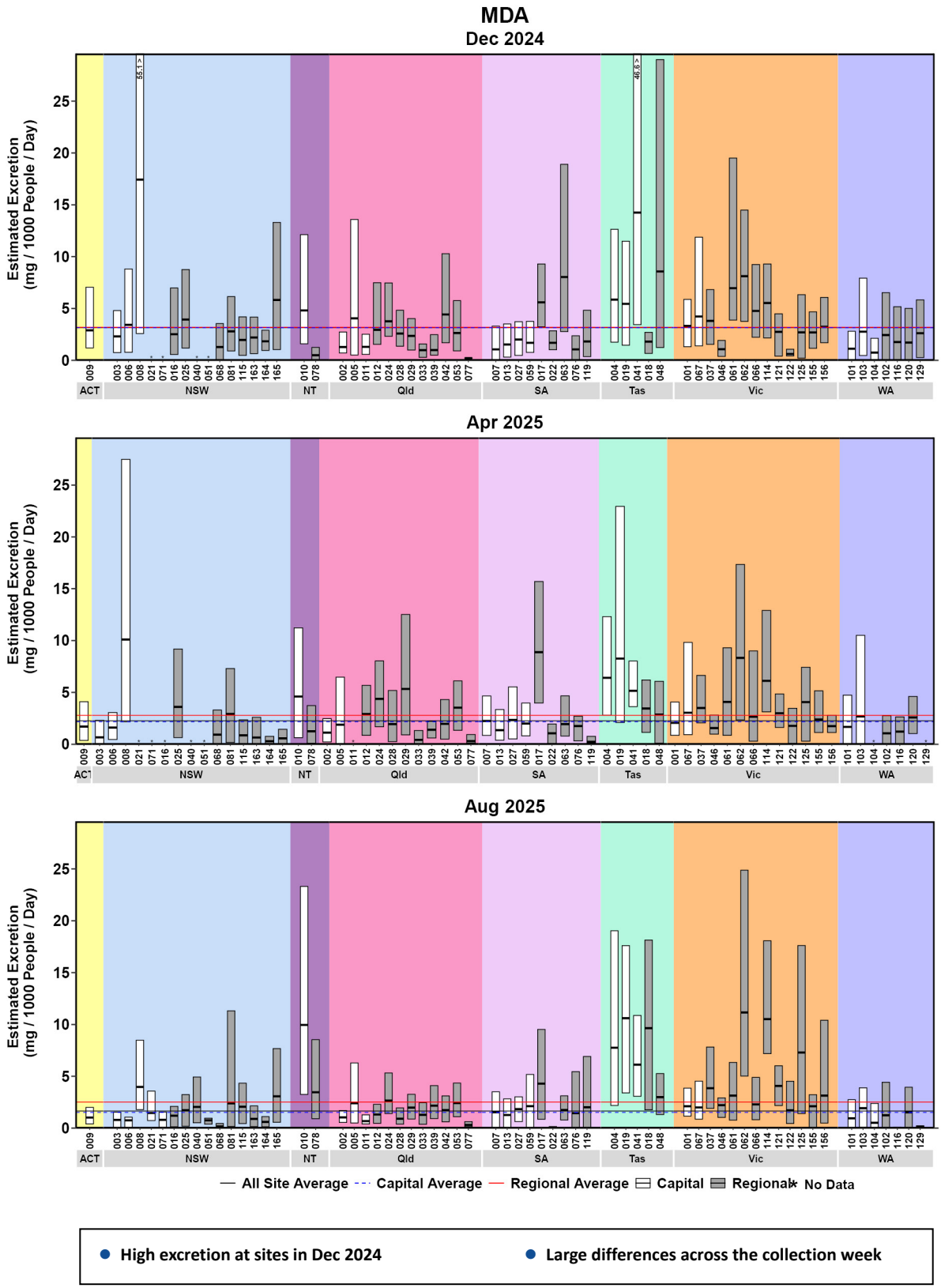


Figure 10: Estimated MDA excretion for December 2024, April 2025 and August 2025 in mass excreted per day per thousand people. Text describing the extreme values shown above the graph are based on the left y axis.



2.1.3 OPIOIDS

Two prescription opioids, oxycodone and fentanyl, are included in the report as well as heroin, an illicit drug. The main metabolites (noroxycodone, norfentanyl and 6-monoacetylmorphine, respectively) were measured to estimate the consumption of these drugs. Oxycodone and fentanyl are legally prescribed pharmaceuticals to treat pain. Although wastewater analysis cannot differentiate between prescribed consumption and consumption for non-medical purposes, these substances remain of interest due to their abuse potential.

2.1.3.1 OXYCODONE

Oxycodone consumption is shown in Figure 11. A distinctive feature across all 3 reporting periods is the elevated regional average compared to the capital city average. Sites in Hobart were consistently amongst the highest for capital city consumption of oxycodone, while sites in Victoria, Queensland and New South Wales had relatively high regional consumption. Oxycodone mean consumption in Western Australia is below capital and regional site averages for the 3 reporting periods.

2.1.3.2 FENTANYL

Average fentanyl consumption was almost identical in regional areas and the capital cities in the 3 reporting periods (Figure 12). Site 81 in regional New South Wales consistently had the highest fentanyl consumption in Australia by some margin. Site 004 in Hobart consistently recorded relatively high consumption compared to other capital city sites. Fentanyl consumption fell below the limit of quantification for all or some days of the week at several sites.

2.1.3.3 HEROIN

Heroin was measured as its unique metabolite, 6-monoacetylmorphine (Figure 13). Average heroin consumption was higher in the capital cities in the 3 reporting periods Consumption of the drug was highest at sites in Sydney and Melbourne, while regional consumption was highest at some sites in New South Wales and Victoria. In other parts of the country, heroin use was relatively low, especially regional Australia. This is reflected in the overall low regional average compared to capital cities. Heroin consumption fell below the limit of quantification in several sites.

Figure 11: Estimated oxycodone consumption for December 2024, April 2025 and August 2025 in mass consumed per day (left axis) and doses per day (right axis) per thousand people.

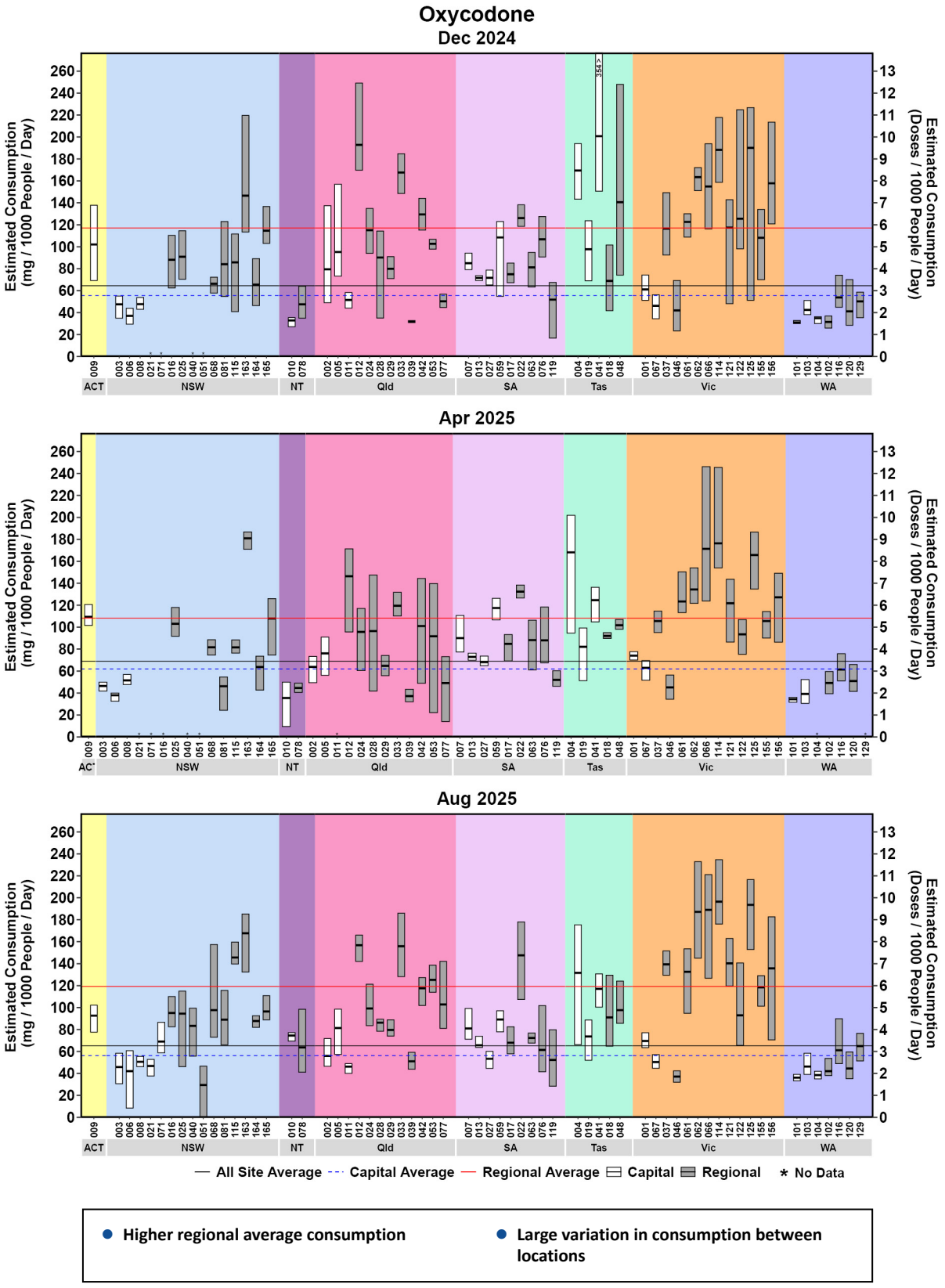


Figure 12: Estimated fentanyl consumption for December 2024, April 2025 and August 2025 in mass consumed per day (left axis) and doses per day (right axis) per thousand people.

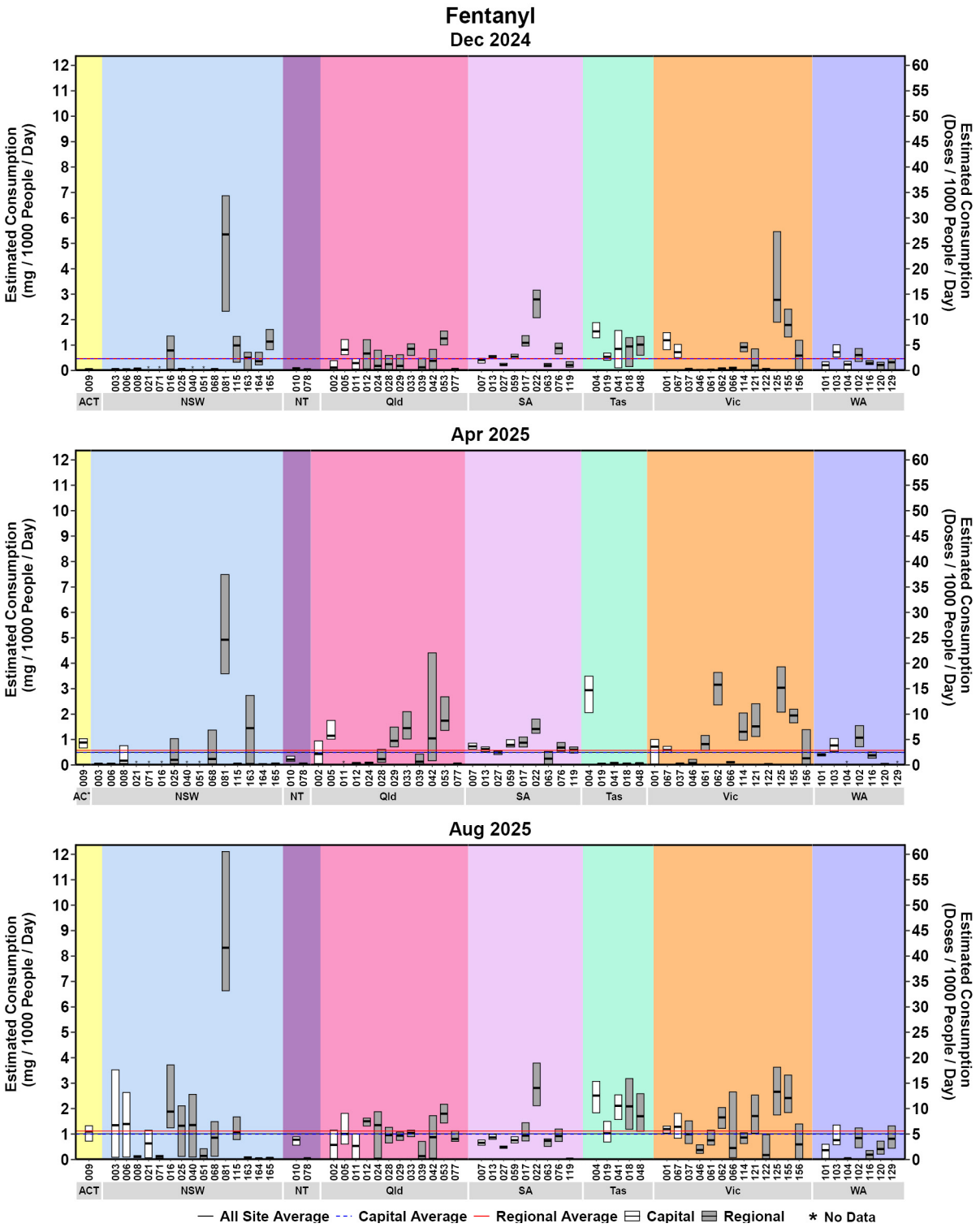
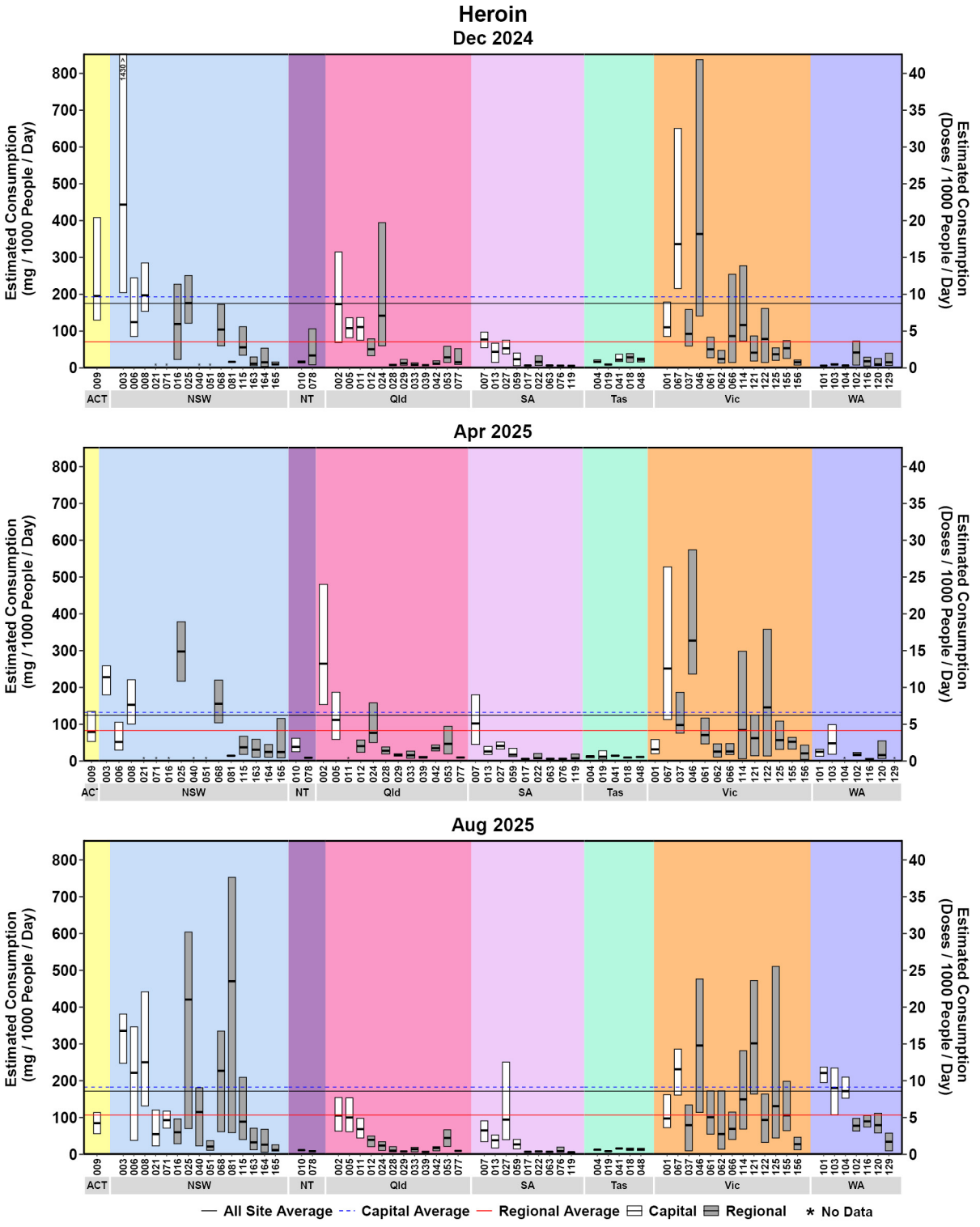


Figure 13: Estimated heroin consumption for December 2024, April 2025 and August 2025 in mass consumed per day (left axis) and doses per day (right axis) per thousand people. Text describing the extreme values shown above the graph are based on the left y axis.



2.1.4 CANNABIS

In terms of wastewater analysis, the sewer design and collection method may play a part in the reportable levels of THC-COOH used for the purposes of the NWDMP. Accordingly, any spatial comparisons should be made with caution. For the NWDMP, separate samples are collected each day and preserved specifically for THC-COOH analysis. The dose amount (8 mg) used in the report is based on the desired effect on an average user of the active ingredient, regardless of the route of administration, e.g. inhaled smoke, part of a plant being used or oral ingestion through edible forms (Freeman and Lorenzetti, 2020). An 8 mg amount would represent between 210–450 mg of dried cannabis containing 15% THC, depending on occasional or regular users consuming the product (Sharma et al 2012).

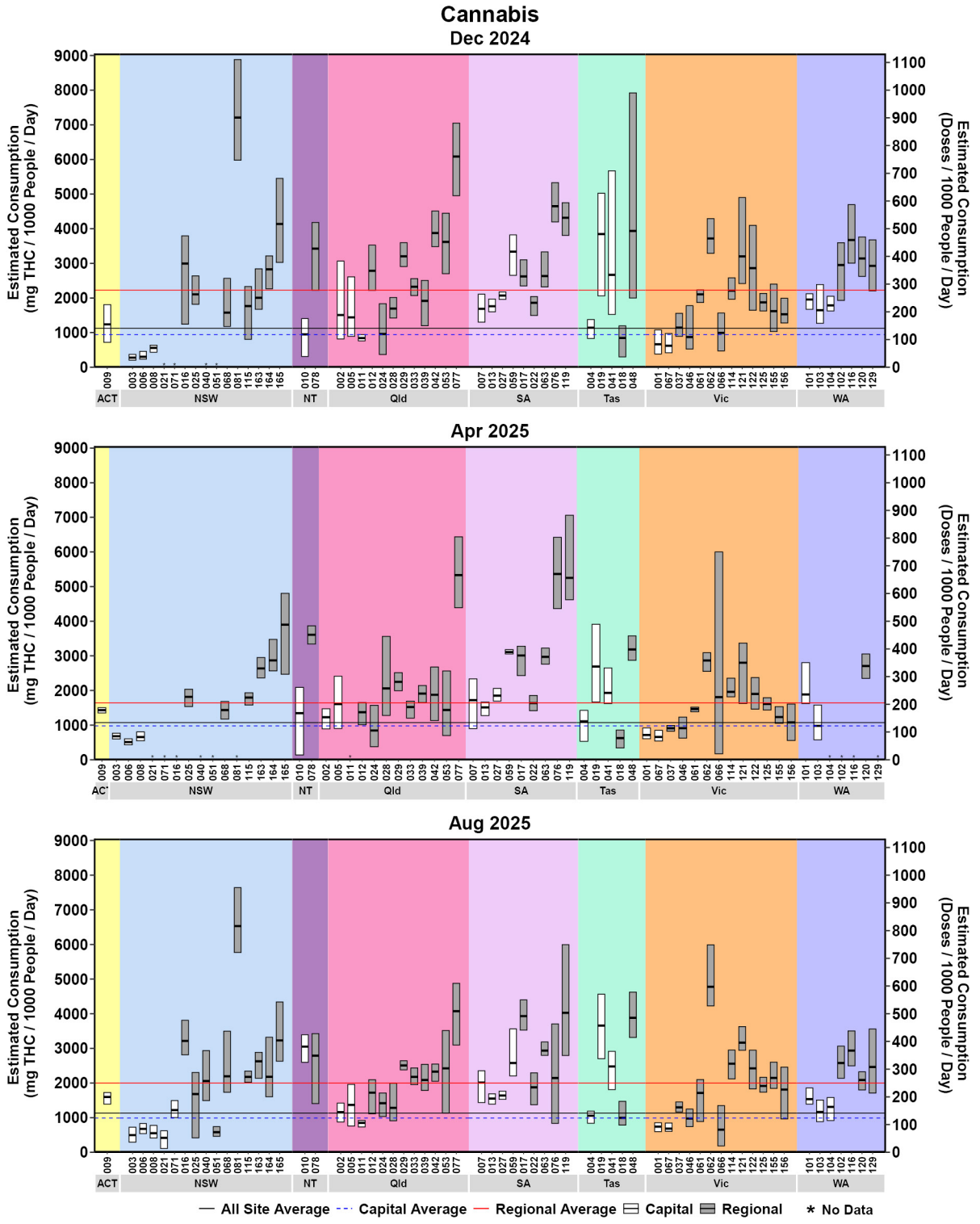
Cannabis consumption is shown in Figure 14. Regional average cannabis consumption was substantially higher than in the capital cities across the 3 reporting periods. Sites in several jurisdictions had well-above average levels for all 3 reporting periods. Sites in Sydney and Melbourne consistently had below average consumption.

2.1.5 KETAMINE

Ketamine, measured as its metabolite norketamine, is used medically for the management of acute pain often associated with surgery or trauma. Ketamine also has veterinary applications. Due to its sedative and hallucinogenic effects, the drug has been associated with illicit substance use and is listed as a new psychoactive substance by the United Nations Office on Drugs and Crime. The reported proportions of ketamine and its metabolites in wastewater leave some doubt as to an appropriate factor to convert excreted amounts to consumed amounts. Therefore, measured levels are shown here as excreted daily mass loads.

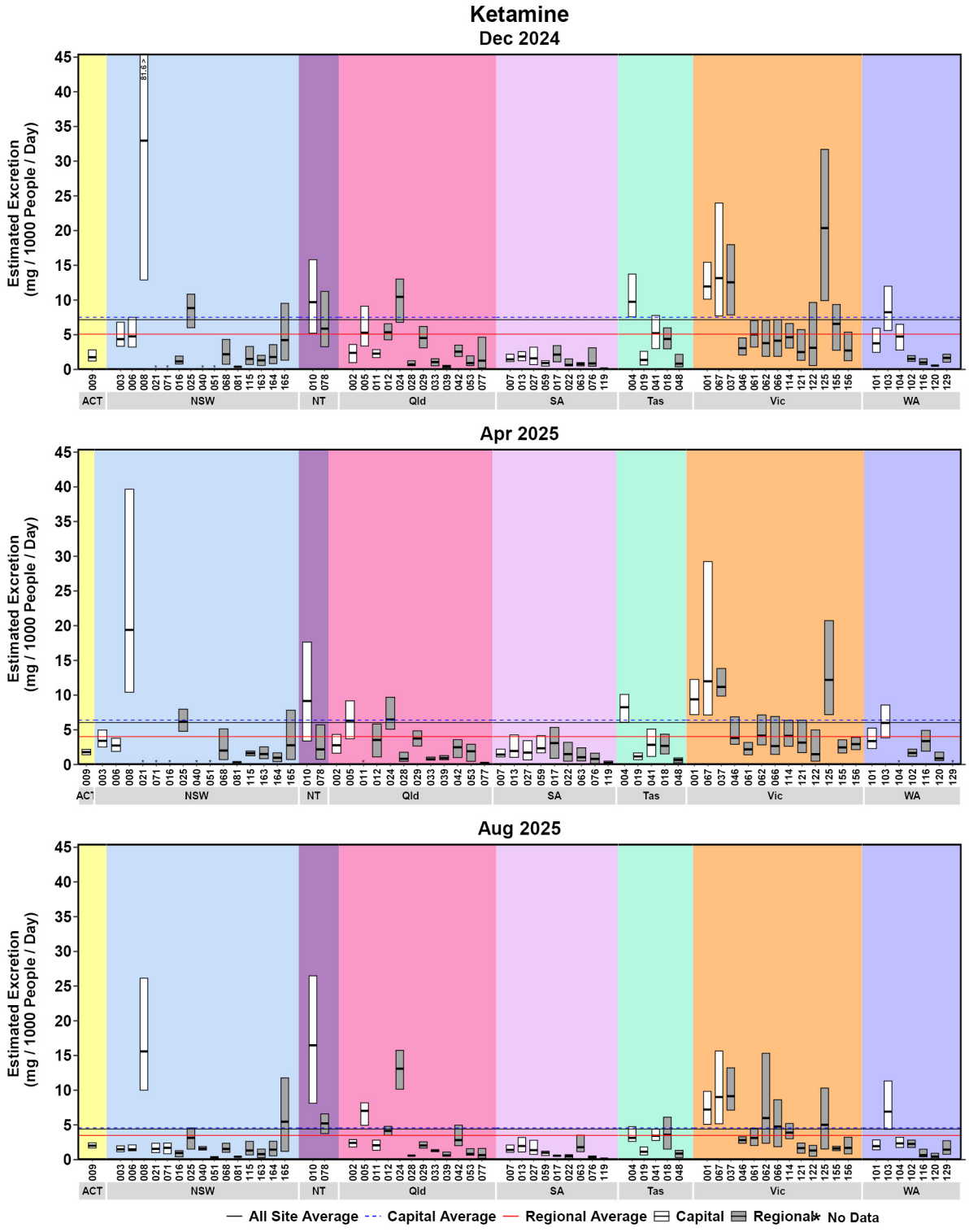
Average ketamine excretion was higher in the capital cities compared to regional areas (Figure 15) in the 3 reporting periods. However, the difference in average excretion progressively diminished from December 2024 to August 2025. Site 008 in Sydney had the highest ketamine excretion nationally, while sites in Darwin, Hobart and Melbourne also had higher excretion than the national average. The highest regional excretion of ketamine was found in sites in Victoria and Queensland. All sites in Canberra and South Australia had relatively low ketamine excretion levels.

Figure 14: Estimated cannabis consumption for December 2024, April 2025 and August 2025 in mass consumed per day (left axis) and doses per day (right axis).



- Higher regional average
- Variable consumption within and between jurisdictions

Figure 15: Estimated ketamine excretion for December 2024, April 2025 and August 2025 in mass excreted per day (left axis) per thousand people. Text describing the extreme values shown above the graph are based on the left y axis.



- Higher capital city excretion
- Specific sites had relatively high excretion

2.2 TEMPORAL CHANGES IN DRUG CONSUMPTION ESTIMATE BY JURISDICTION

This section compares average consumption by state or territory for each drug, comparing new data from this report with previous reports. New capital city data include collections for December 2024 and February, April, June, August and October 2025, while regional areas were updated for December 2024 and April and August 2025. Due to the larger number of data points collected by the Program, the current report presents the last 2 years of data. Due to the large number of data bars included in each annual report, we have added a visual aid (an upside-down triangle) to indicate where the new data added in this report begins (sections 2.2 to 2.4). Prior data dating back to 2016 for each substance of interest is available on the ACIC website by state or territory.

Although every effort has been made to assess the same sites for each period, the individual sites and the number of sites used to generate the population-weighted averages may have changed between periods. Comparing between time points should be done with caution. This is most evident for the regional averages, where regional participation has varied more between periods, while capital city site participation has been much more consistent (see Appendix 2 for a list of sites participating in this report).

Note: The horizontal red, blue and black lines on each graph in this section represent the cumulative population-weighted average of all sampling time points and all samples analysed for the Program. This includes all of the data not shown on the graphs which has been collected since monitoring for the drug commenced for the Program (August 2016 for most substances or, for example, December 2020 for ketamine). This is an important distinction from Section 2.1 where the average lines represent the population-weighted average of the sites from the reporting period shown on the graph.

2.2.1 NICOTINE AND ALCOHOL

The consumption of nicotine refers to all sources, including from tobacco, e-cigarettes and nicotine replacement therapies. Nicotine consumption has been variable across Australia over the last 2 years (Figure 16). The Northern Territory has the highest per capita consumption of nicotine nationally. Brisbane has shown a gradual increase in consumption over the past year. In other jurisdictions, changes over the same one-year reporting period are inconclusive. Apart from the Northern Territory and Tasmania, regional areas of each jurisdiction consumed more nicotine per capita than the respective capital cities.

The Northern Territory has the highest per capita consumption of alcohol nationally (Figure 17). South Australia and Tasmania are the only states where regional alcohol use is substantially lower than the respective capital cities.

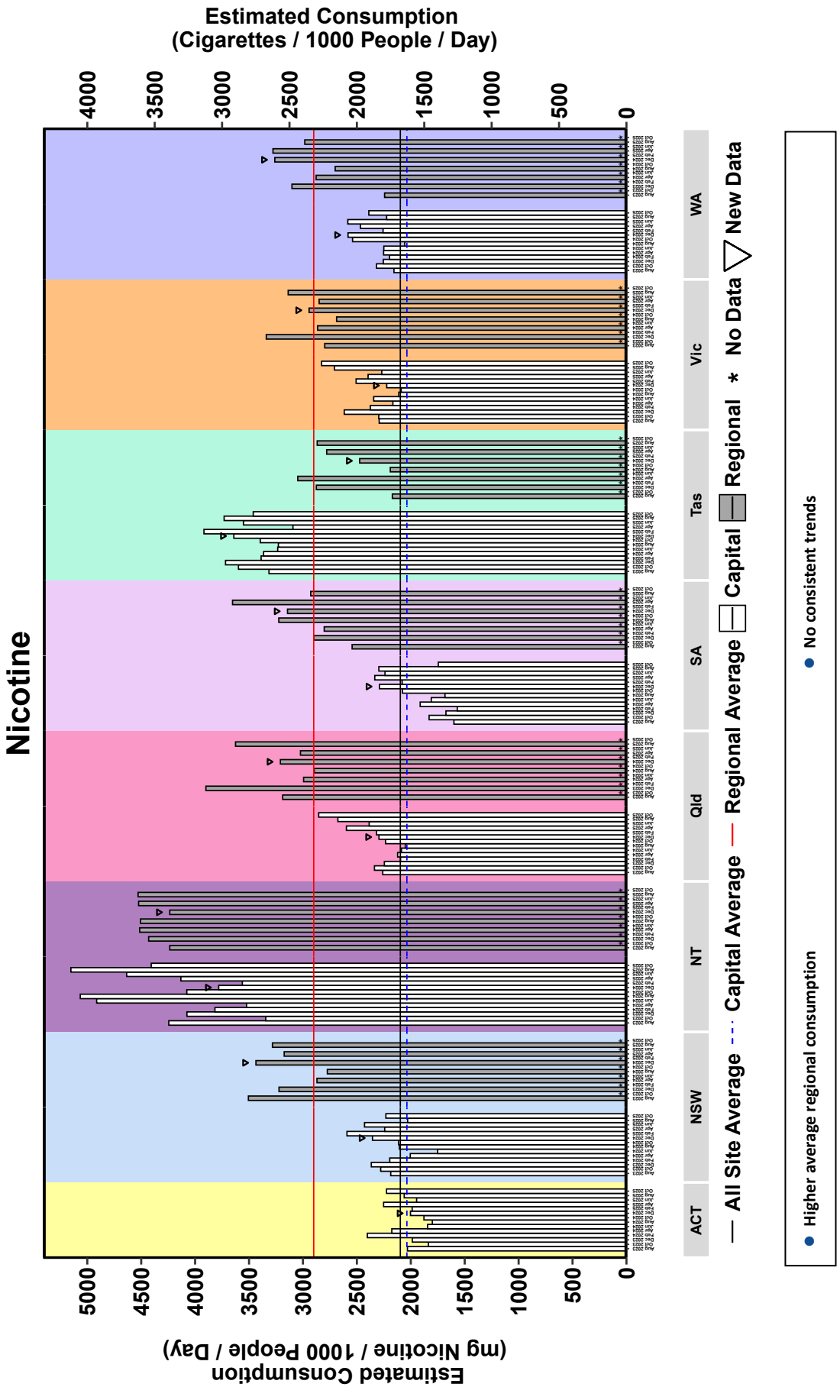


Figure 16: Estimated average consumption of nicotine by state/territory, August 2023 to October 2025, where 1 cigarette provides 1.25 mg of nicotine. The triangle above the data bars indicates where the new data from this report begins (6 periods for capital cities and 3 periods for regional areas).

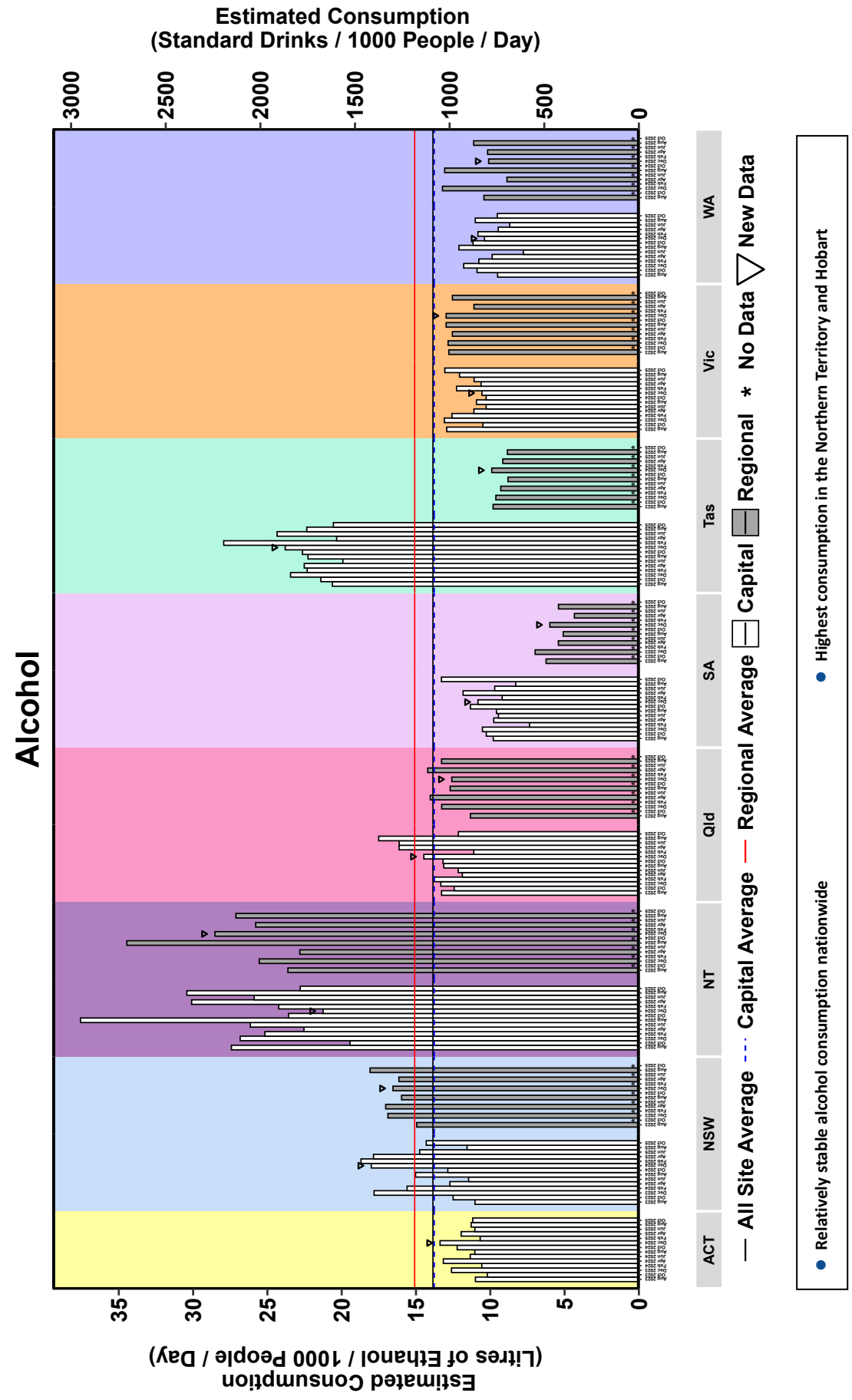


Figure 17: Estimated average consumption of alcohol by state/territory, August 2023 to October 2025. A standard drink is 10.0 g, or 12.6 mL. The triangle above the data bars indicates where the new data from this report begins (6 periods for capital cities and 3 periods for regional areas).

2.2.2 STIMULANTS

2.2.2.1 METHYLAMPHETAMINE

The long-term average methylamphetamine consumption in regional Australia is higher than in the capital cities (Figure 18). An increase in consumption is apparent in most jurisdictions over the past 2 years. The December 2024 to August 2025 collection periods have continued this trend for the most part. Regional areas of Western Australia currently have the highest overall methylamphetamine consumption, while Adelaide, Melbourne and Perth generally had the highest capital city consumption.

Historical levels of methylamphetamine consumption predating the NWDMP have been available for some sites, shown in Figure 19 and Figure 20. A gradual increase over the past 3 years is apparent in almost every instance, reflecting the national trend. Sites in Queensland, South Australia and Western Australia have had slightly higher methylamphetamine consumption in the past, but the 2 sites in Melbourne reached historic highs during this reporting period.

2.2.2.2 COCAINE

Cocaine consumption has also been generally increasing over the last 2 years in most capital cities and regional areas, with some variability depending on jurisdiction (Figure 21). Darwin, Melbourne and Sydney currently have the highest cocaine consumption of the capital cities, while regional New South Wales and Queensland have the highest consumption. Consumption of the drug is substantially higher in capital cities compared to regional areas within most jurisdictions, except in Queensland and New South Wales where levels are more similar.

2.2.2.3 MDMA

MDMA consumption is shown in Figure 22. Levels have been highly variable over the past 2 years, including the period from December 2024 to August 2025. Darwin and Hobart currently have the highest MDMA consumption. Unlike the long-term cumulative average reflected in the figure, regional MDMA consumption is starting to drop to levels at or below that of the capital cities in many parts of the country.

2.2.2.4 MDA

The excreted amount of MDA has been on average higher in regional areas (Figure 23). Hobart has consistently high MDA excretion compared to other parts of the country over the past 2 years. In other parts of the country, excretion is variable and at relatively low levels, with no clear patterns evident. Tasmania and Northern Territory are the only jurisdictions with substantial increases in regional MDA excretion over the past 2 years.

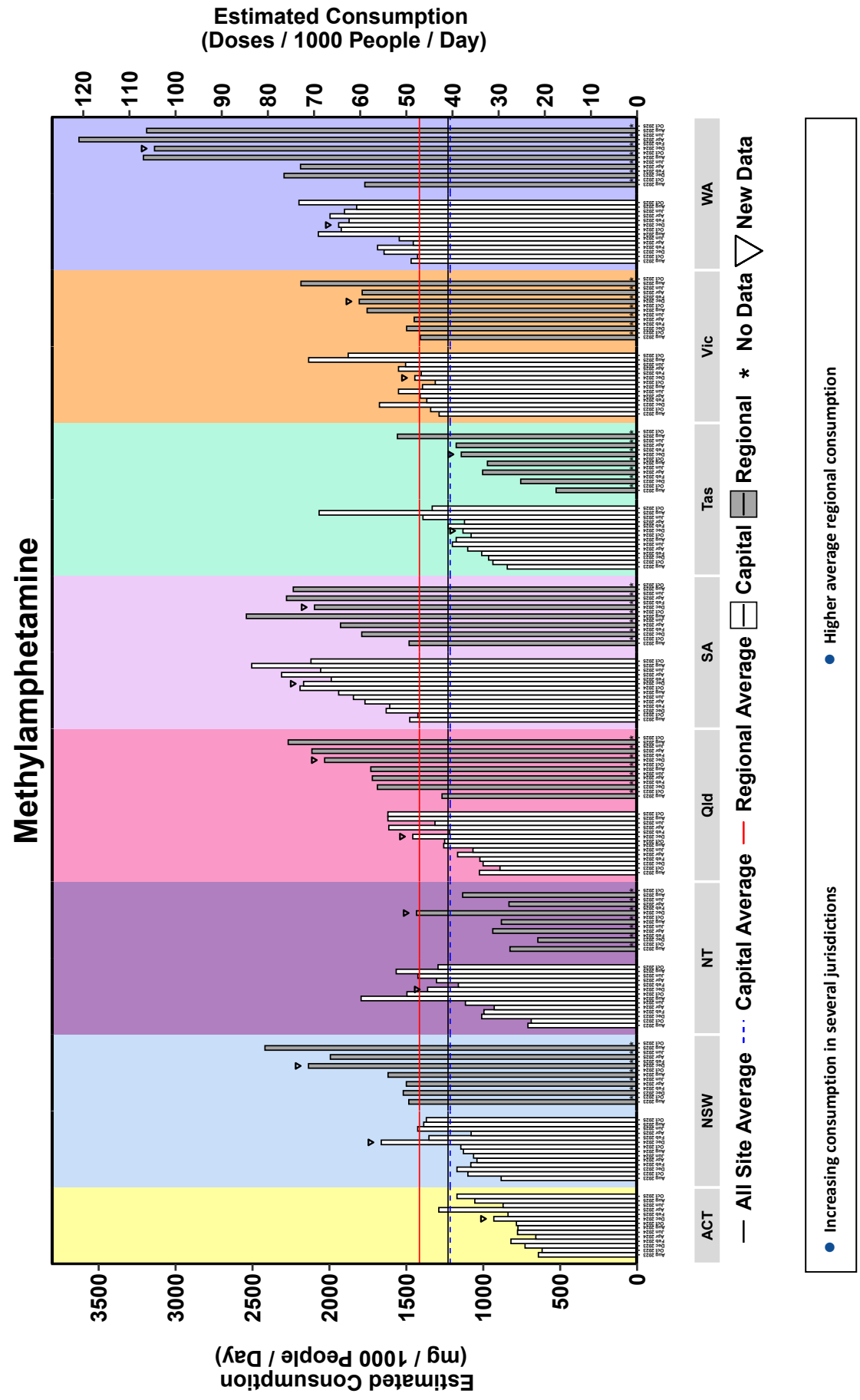
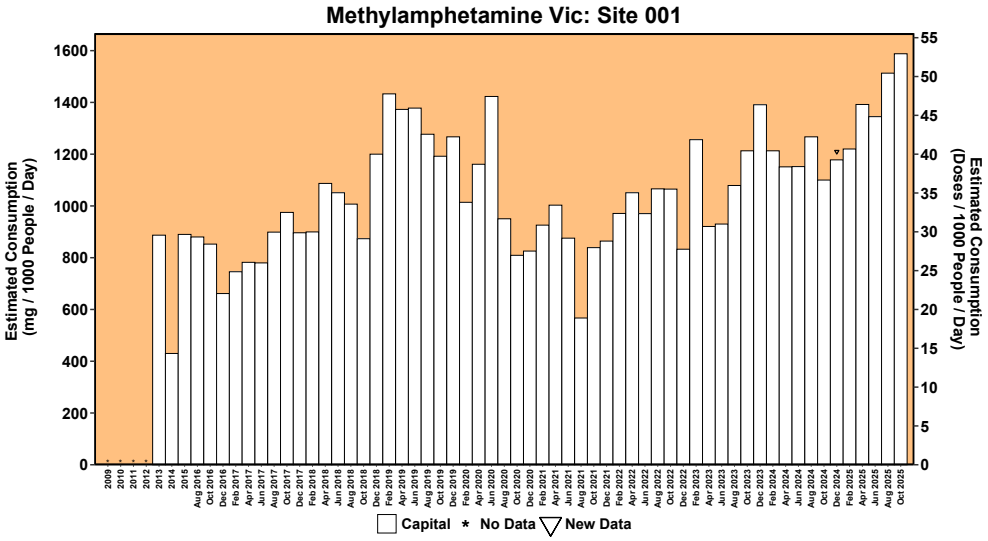
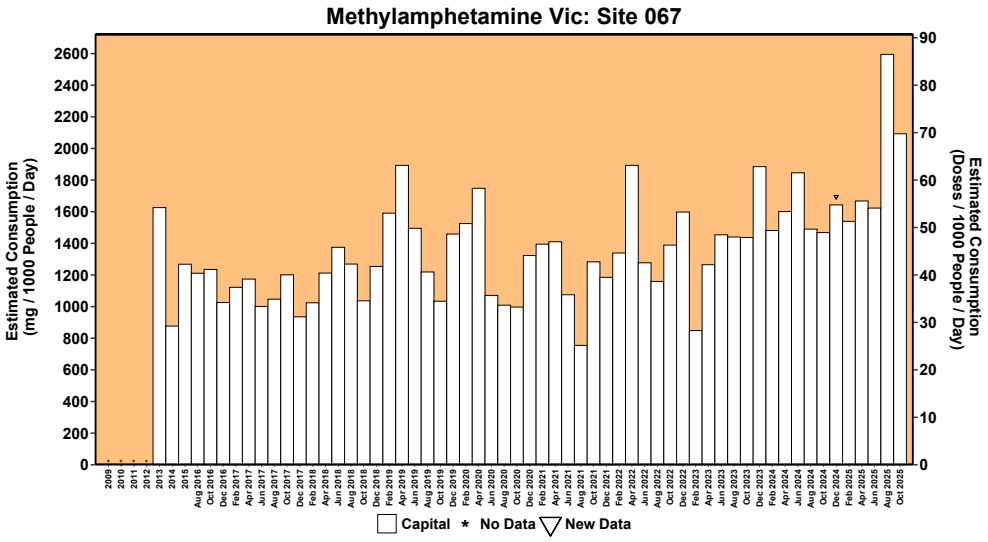


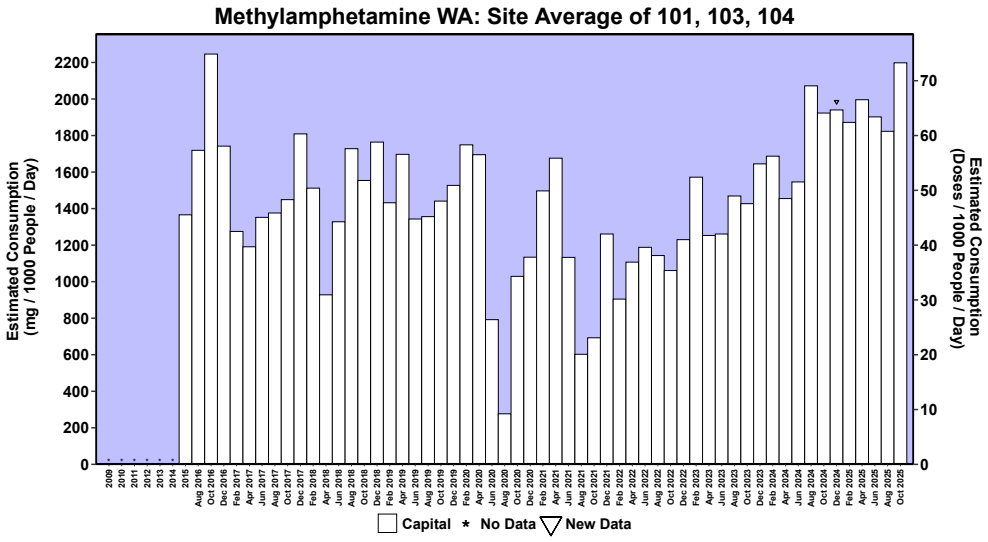
Figure 18: Estimated average consumption of methylamphetamine by state/territory, August 2023 to October 2025. The triangle above the data bars indicates where the new data from this report begins (6 periods for capital cities and 3 periods for regional areas).

Figure 19: Change in methylamphetamine consumption for sites in Queensland and Adelaide with historical data. The triangle above the data bars indicates where the new data from this report begins (6 periods for capital cities and 3 periods for regional areas).

Figure 20: Change in methylamphetamine consumption for sites in Melbourne and Perth with historical data. Both Melbourne sites were the average of one week per year in 2013, 2014 and 2015. The triangle above the data bars indicates where the new data from this report begins (6 periods for capital cities and 3 periods for regional areas).







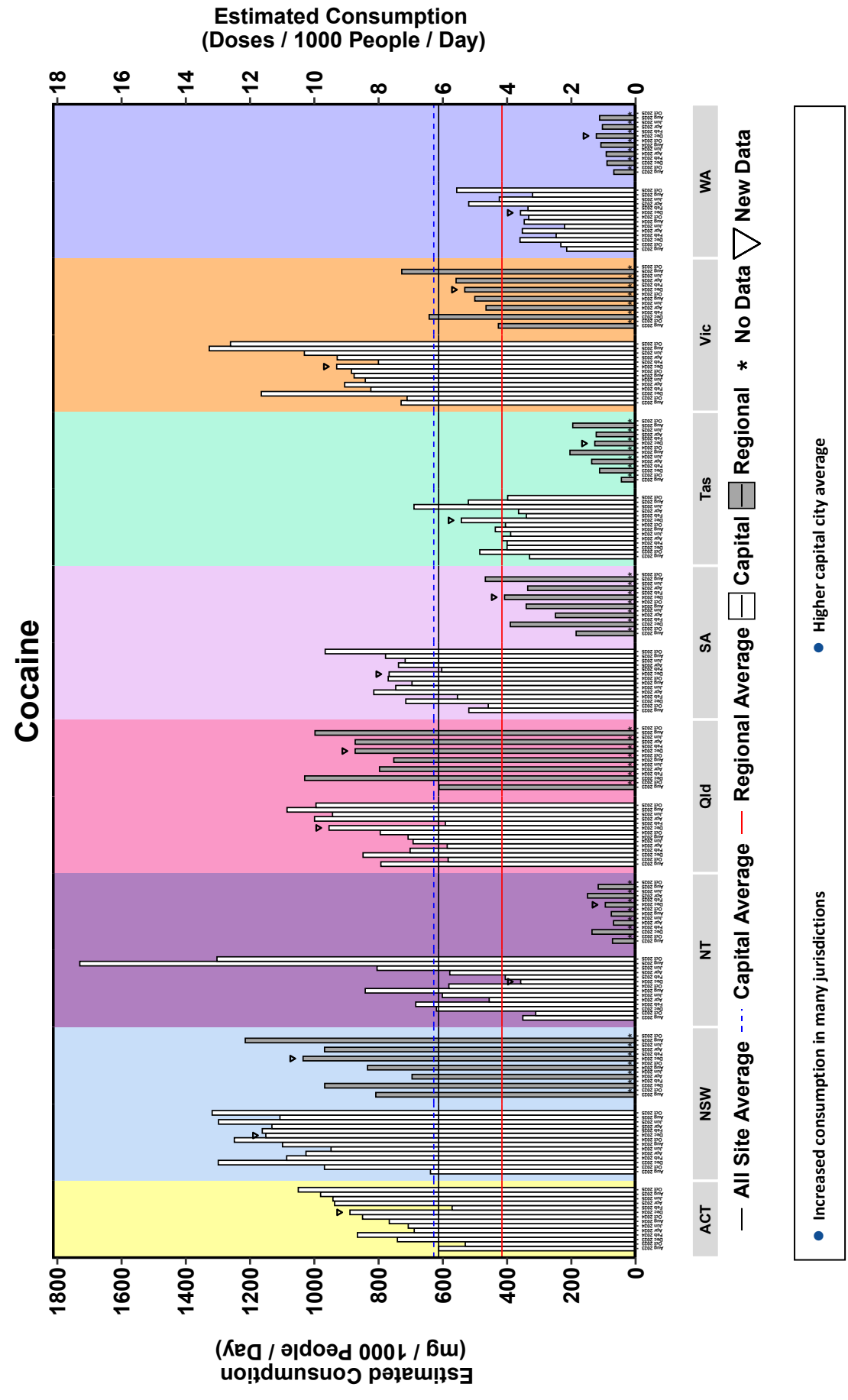


Figure 21: Estimated average consumption of cocaine by state/territory, August 2023 to October 2025. The triangle above the data bars indicates where the new data from this report begins (6 periods for capital cities and 3 periods for regional areas).

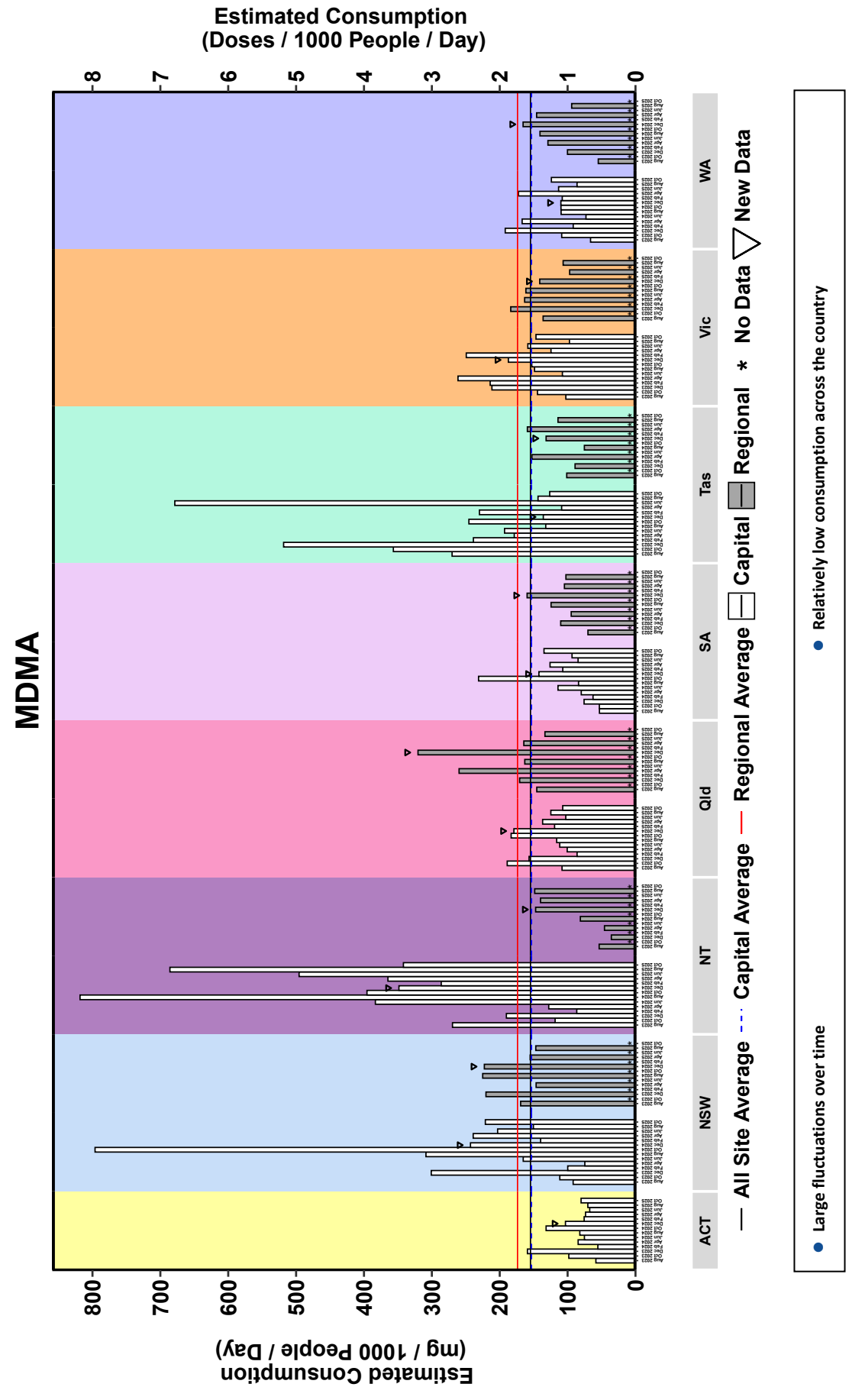


Figure 22: Estimated average consumption of MDMA by state/territory, August 2023 to October 2025. The triangle above the data bars indicates where the new data from this report begins (6 periods for capital cities and 3 periods for regional areas).

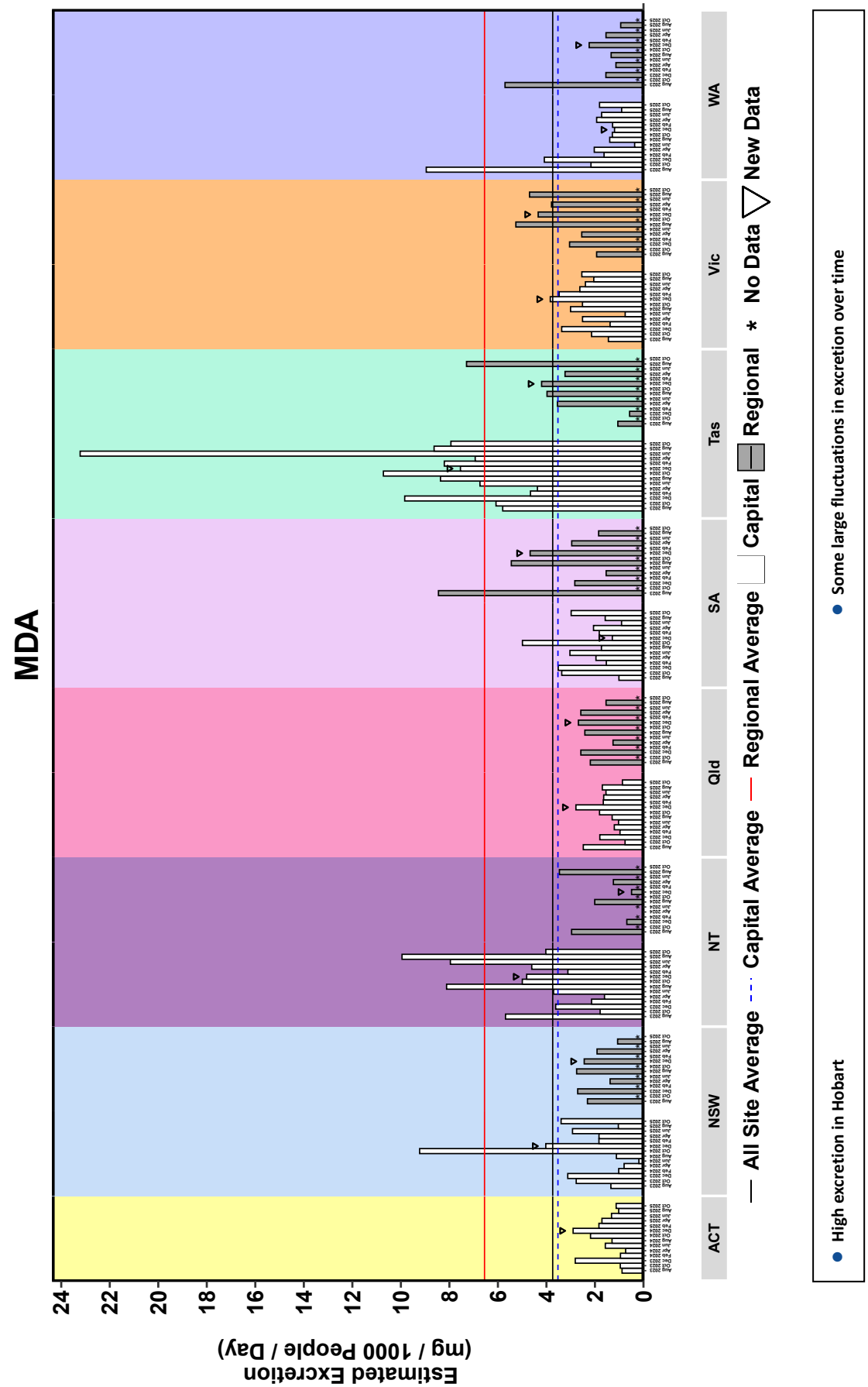


Figure 23: Estimated average excretion of MDA by state/territory, August 2023 to October 2025. The triangle above the data bars indicates where the new data from this report begins (6 periods for capital cities and 3 periods for regional areas).

2.2.3 OPIOIDS

2.2.3.1 OXYCODONE

Long-term average regional oxycodone consumption is well-above that of consumption in the capital cities (Figure 24). Tasmania has historically been the only exception, with lower consumption in the regional sites compared to Hobart sites. Hobart and Canberra have the highest capital city consumption, but levels have been declining over the past 2 years in Hobart. Regional areas of Victoria and Queensland consume more oxycodone per capita than regional areas of the other jurisdictions.

2.2.3.2 FENTANYL

Fentanyl consumption levels in regional areas of most jurisdictions have been erratic, with tangible increases in consumption in some jurisdictions recently (Figure 25). The fluctuations are amplified by the relatively low consumption levels reflected in the graph. The historical regional average has been substantially higher than the capital city average. However, within jurisdictions this gap has been decreasing, with similar levels between capital city and regional consumption observed in the current period for most states or territories.

2.2.3.3 HEROIN

Heroin consumption has been historically higher in the capital cities compared to regional areas (Figure 26). In August and October 2025, Sydney was the capital city with the highest consumption of heroin. Regional heroin consumption is also far higher in New South Wales than in Victoria, with very low levels in regional areas of most other jurisdictions notwithstanding a recent spurt in regional Western Australia.

Historical heroin data for Adelaide are available back to 2013 before it was added to the Program in 2017. Current heroin consumption largely falls within the same range as the historical data and has generally been decreasing over the past 12 months (Figure 27).

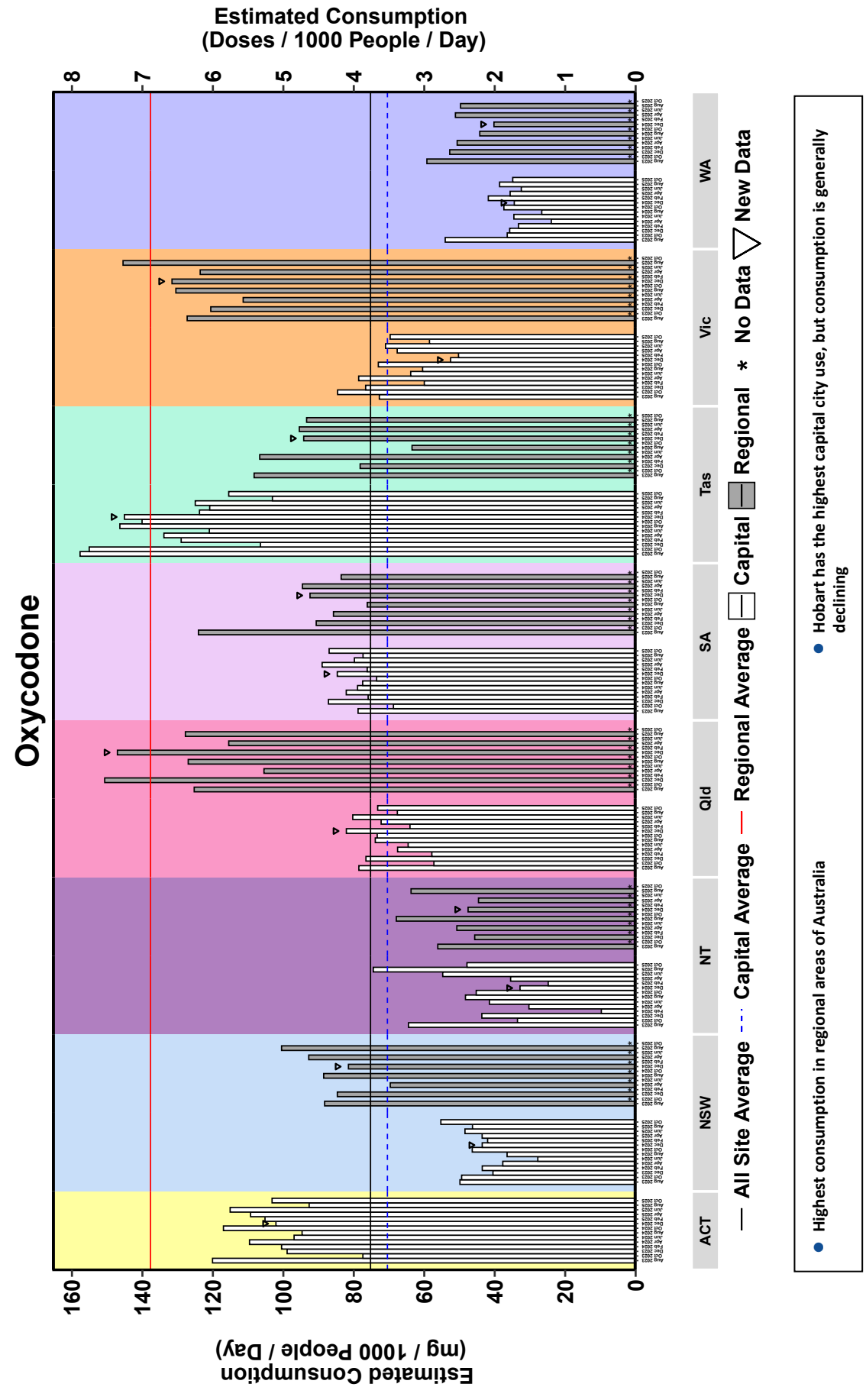


Figure 24: Estimated average consumption of oxycodone by state/territory, August 2023 to October 2025. The triangle above the data bars indicates where the new data from this report begins (6 periods for capital cities and 3 periods for regional areas).

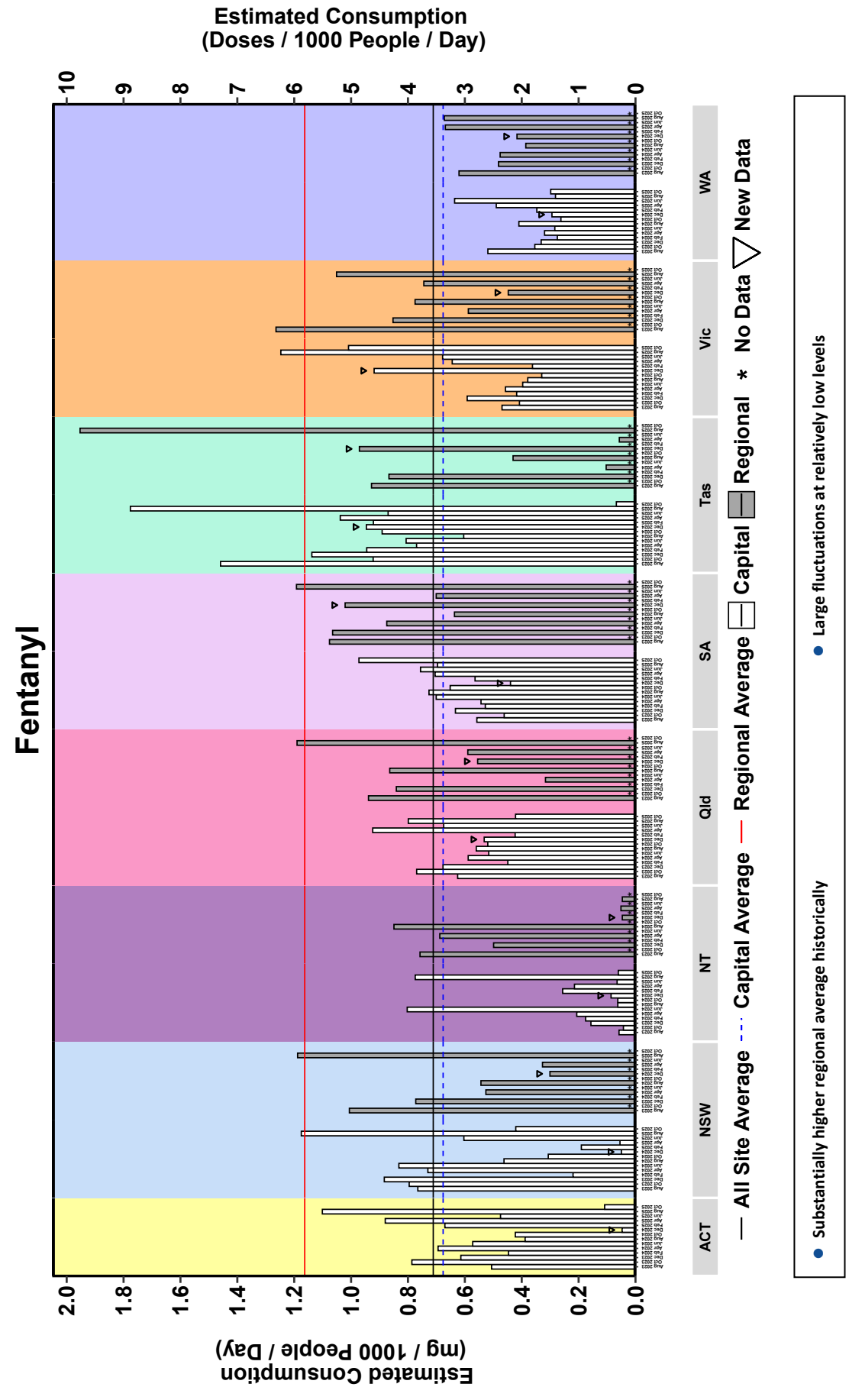


Figure 25: Estimated average consumption of fentanyl by state/territory, August 2023 to October 2025. The triangle above the data bars indicates where the new data from this report begins (6 periods for capital cities and 3 periods for regional areas).

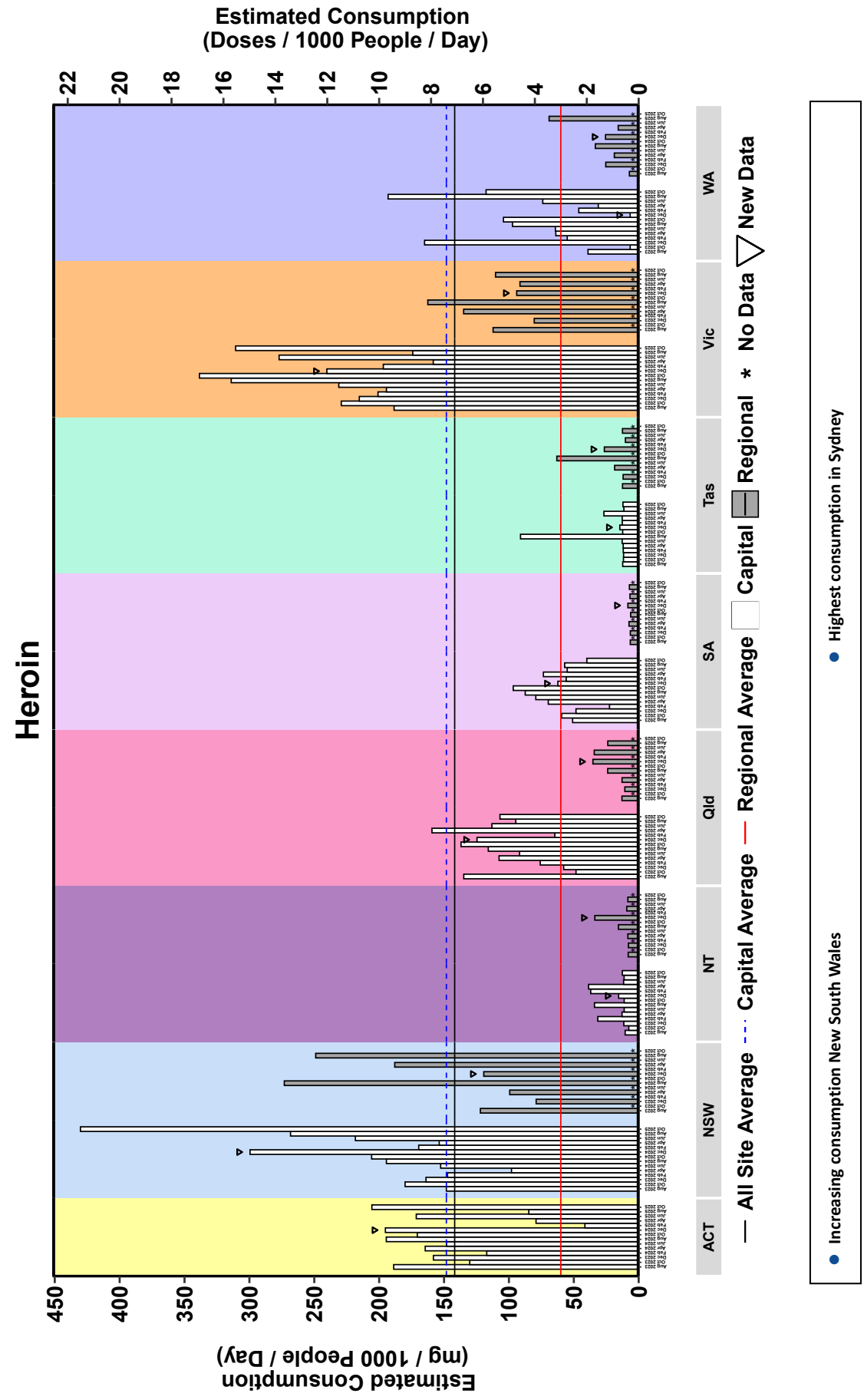
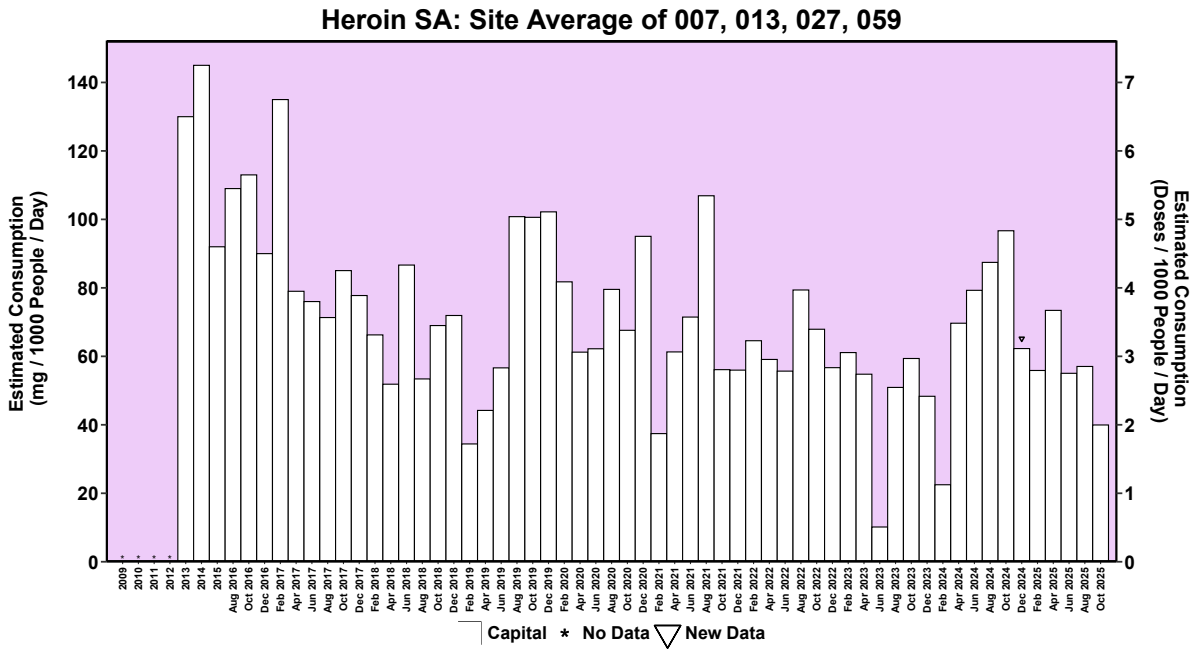


Figure 26: Estimated average consumption of heroin by state/territory, August 2023 to October 2025. The triangle above the data bars indicates where the new data from this report begins (6 periods for capital cities and 3 periods for regional areas).

Figure 27: Change in heroin consumption for sites in Adelaide with historic data. The triangle above the data bars indicates where the new data from this report begins (6 periods for capital cities and 3 periods for regional areas).



2.2.4 CANNABIS

Average regional consumption of cannabis remains higher than in the capital cities, except in Tasmania where Hobart has higher consumption than sites in regional Tasmania (Figure 28). Cannabis consumption in regional areas of the Northern Territory, South Australia and Western Australia is substantially higher than the national average, while Hobart has the highest consumption of the capital cities.

Long-term cannabis data are available for Adelaide (Figure 29). February 2025 was a historically high level for the city, with remaining data over the last year reflecting relatively high levels of consumption.

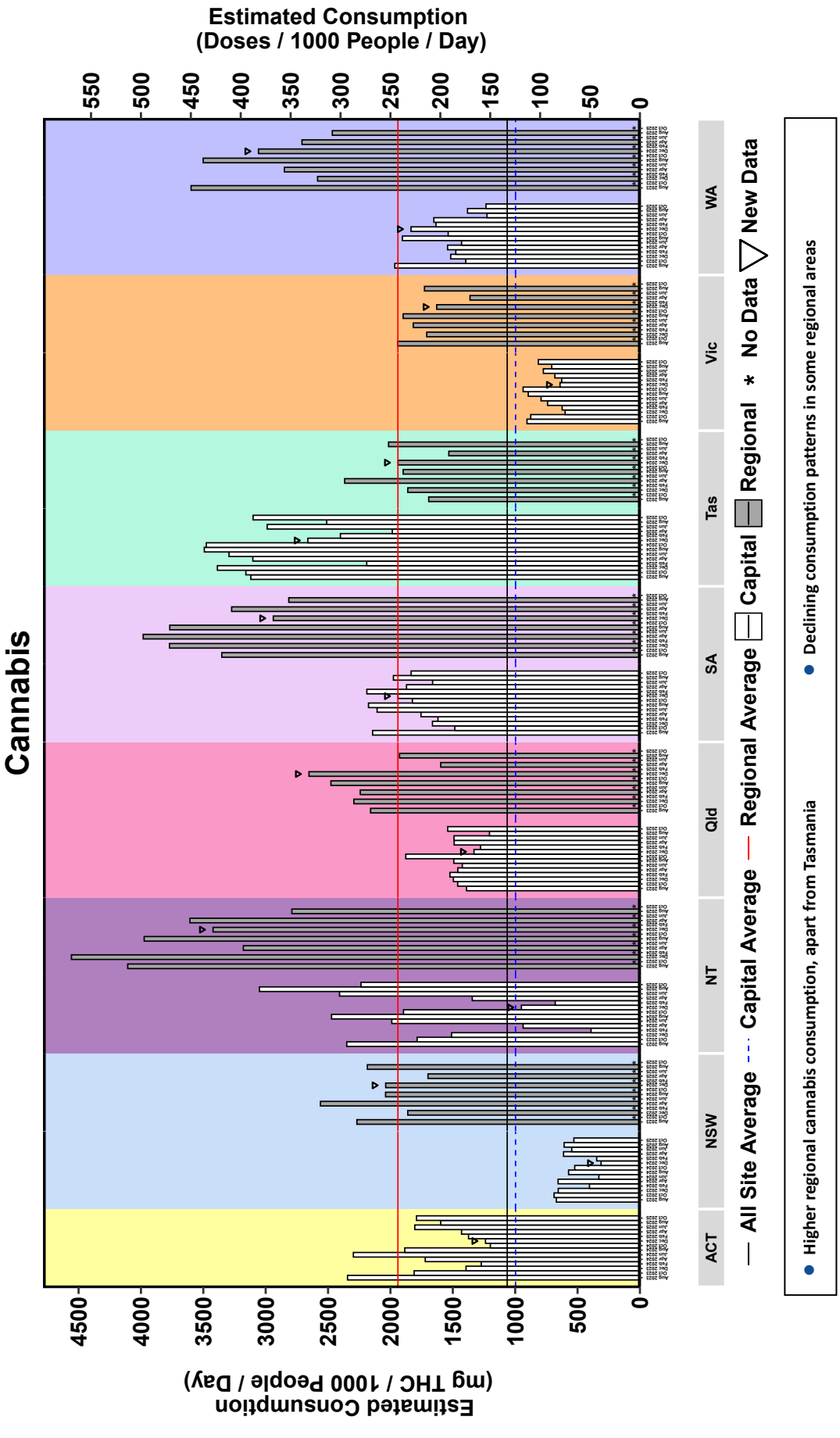
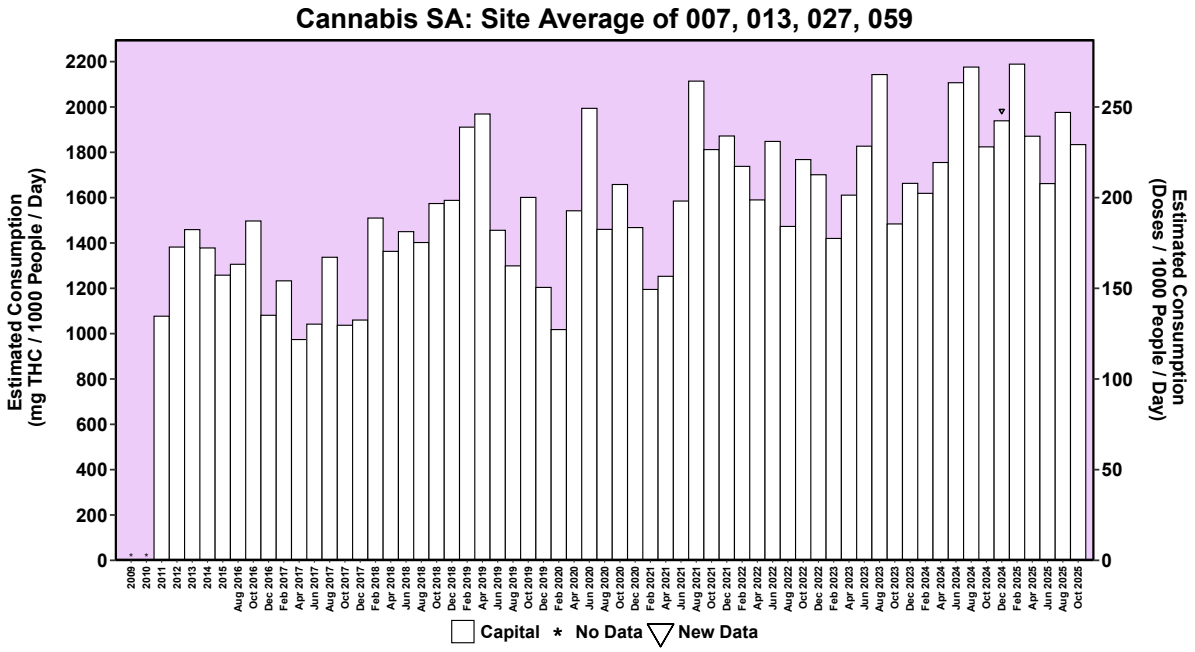


Figure 28: Estimated average consumption of cannabis by state/territory, August 2023 to October 2025. The triangle above the data bars indicates where the new data from this report begins (6 periods for capital cities and 3 periods for regional areas).

Figure 29: Change in cannabis consumption for sites in Adelaide with historical data. Cannabis is detected via the THC metabolite, THC-COOH. The triangle above the data bars indicates where the new data from this report begins (6 periods for capital cities and 3 periods for regional areas).



2.2.5 KETAMINE

The excreted amounts of ketamine have been variable across the country and higher in the capital cities compared to regional areas (Figure 30). Over the past 2-year period, levels have generally been highest in Darwin and Melbourne. Increased ketamine excretion was apparent in many states and territories leading up to the start of 2025, but levels had fallen back in many jurisdictions by October 2025. A slowly increasing trend is still evident in Canberra and Brisbane.

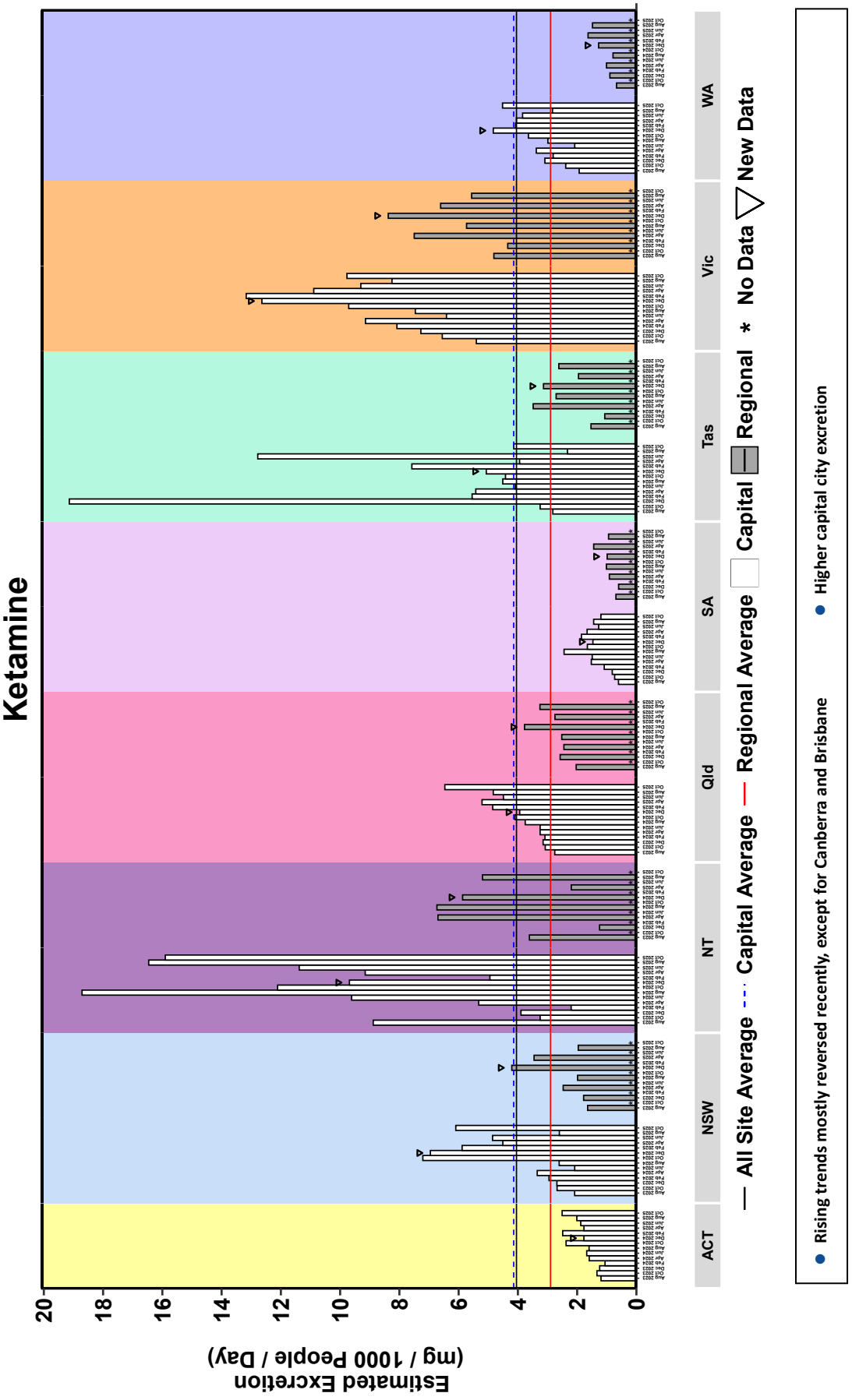


Figure 30: Estimated average excretion of ketamine by state/territory, August 2023 to October 2025. The triangle above the data bars indicates where the new data from this report begins (6 periods for capital cities and 3 periods for regional areas).

2.3 NATIONAL CAPITAL CITY AND REGIONAL AVERAGES

The population-weighted average was calculated for all capital city and regional sites to formulate national trends (Figure 31 to Figure 36). Fewer sites participated in October 2016 and to account for this, the average consumption in August and December 2016 was used for sites with missing data to provide the overall October 2016 estimate. October 2016 results are shown in blue to reflect this. Regional sites are collected every second sampling period. Due to the large number of data bars included in each annual report, we have added a visual aid (an upside-down triangle) to indicate where the new data added in this report begins.

2.3.1 NICOTINE AND ALCOHOL

National nicotine trends clearly show the substantially higher consumption in regional areas than in the capital cities (Figure 31). Nicotine consumption has been rising gradually over several years and reached the highest levels to date in the capital cities in October 2025 and the second highest for regional sites in August 2025. In regional areas, levels remained near historical high levels throughout the past year.

Alcohol consumption has been relatively stable over the past 3 years and mostly below the long-term averages over the life of the Program (Figure 31). Regional consumption has been on average higher than the capital city average over the life of the Program. Results for the December 2024 to October 2025 period have largely been consistent with preceding findings.

2.3.2 STIMULANTS

2.3.2.1 METHYLAMPHETAMINE

National methylamphetamine consumption trends are shown in Figure 32. There has been a steady increase is use since August 2021. Methylamphetamine consumption in August 2025 was the highest recorded over the life of the Program for both capital cities and regional areas. From August 2023, the extent that methylamphetamine consumption in regional areas exceeds that in the capital cities has continued to grow.

2.3.2.2 COCAINE

Cocaine consumption continues to increase nationally (Figure 32). Cocaine consumption reached the highest levels recorded by the Program in August 2025 in regional areas and October 2025 in the capital cities. Cocaine consumption in the capital cities continues to exceed regional consumption.

2.3.2.3 MDMA

National average MDMA consumption has followed a wave pattern over the life of the Program (Figure 33). The latest wave peaked late 2024 to early 2025, depending on capital city or regional results. MDMA consumption is currently declining in regional areas, while capital city consumption has been relatively stable in 2025. Long-term average regional consumption of MDMA is slightly higher than average capital city consumption.

2.3.2.4 MDA

The latest results from December 2024 to October 2025 (Figure 33) show relatively low MDA excretion, with similar levels in both capital cities and regional areas, compared with much higher regional consumption earlier in the Program.

2.3.3 OPIOIDS

2.3.3.1 OXYCODONE

Oxycodone consumption has been consistently higher in regional areas than in the capital cities (Figure 34). Consumption of the drug has been relatively stable over the past 4 years, with only small changes between reporting periods. The latest set of results are consistent with the continuing pattern.

2.3.3.2 FENTANYL

Fentanyl consumption in regional areas has generally exceeded consumption in the capital cities (Figure 34). The latest results show that the gap has narrowed, with consumption results from December 2024 to August 2025 very similar between the regional and capital averages. Fentanyl consumption has varied over the past 4 years, but generally at relatively low levels. However, average consumption increased tangibly in the capital cities and regional areas between December 2024 and August 2025.

2.3.3.3 HEROIN

Heroin consumption is substantially higher in the capital cities than in regional areas (Figure 35) and fluctuates substantially between collection periods. Average heroin consumption in the capital cities in October 2025 was the highest recorded over the life of the Program. Regional heroin consumption has also increased since 2023, with current levels second only to the historical high in August 2024.

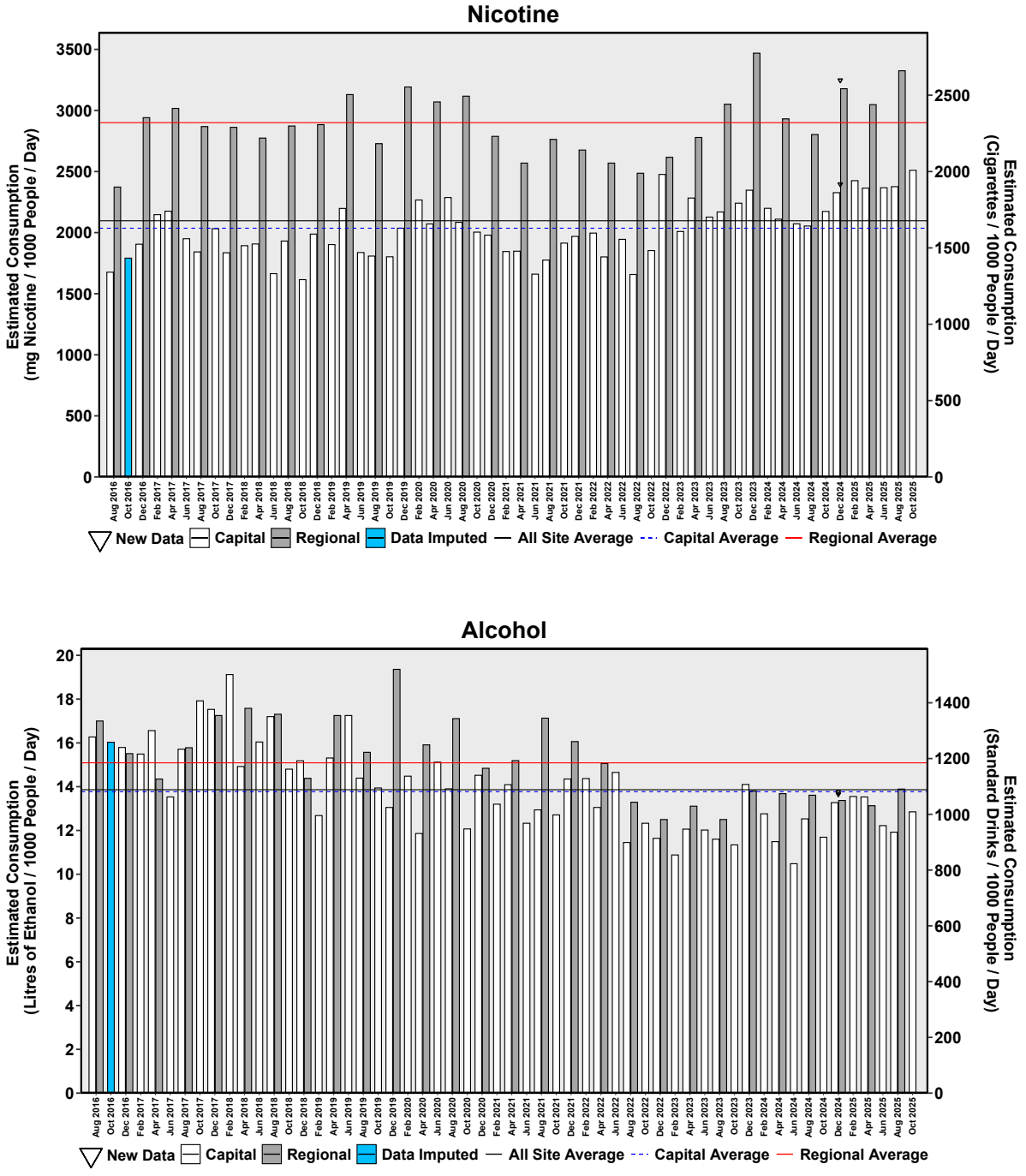
2.3.4 CANNABIS

Cannabis has been monitored since August 2018. Cannabis consumption has been consistently and substantially higher in regional areas compared to the capital cities (Figure 35). In the capital cities, levels have remained steady over several years, while regional consumption declined in 2025 compared to the previous 3 years.

2.3.5 KETAMINE

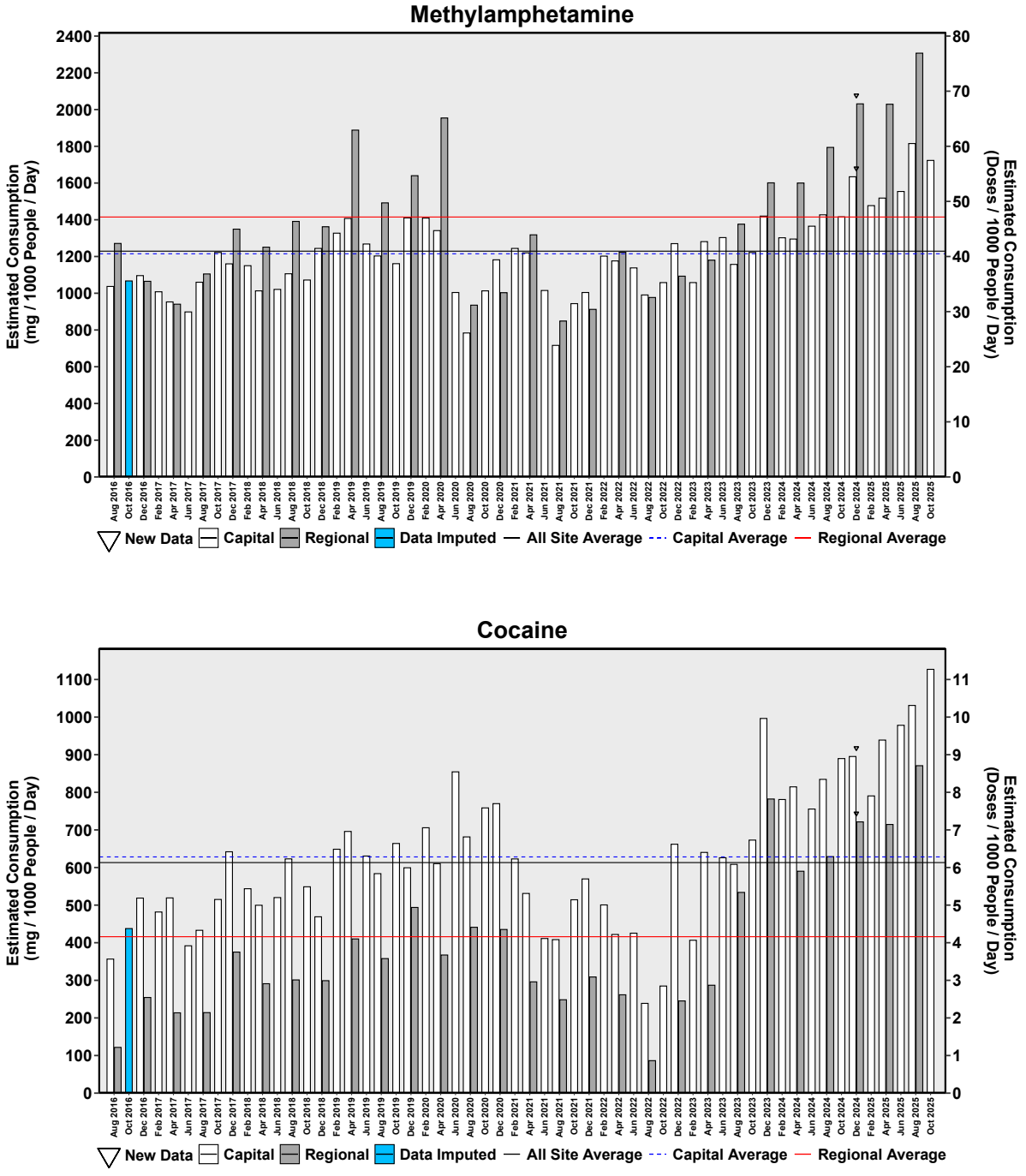
Ketamine has been monitored since December 2020. Ketamine excretion increased steadily in capital cities and to a lesser extent in regional areas until the end of 2024 (Figure 36). Excretion reached the highest levels recorded since monitoring started for the capital cities and regional areas in December 2024. Excretion of the drug has progressively declined since then in regional areas and in the capital cities until October 2025.

Figure 31: The population-weighted average of all sites for nicotine and alcohol. The triangle above the data bars indicates where the new data from this report begins (6 periods for capital cities and 3 periods for regional areas).



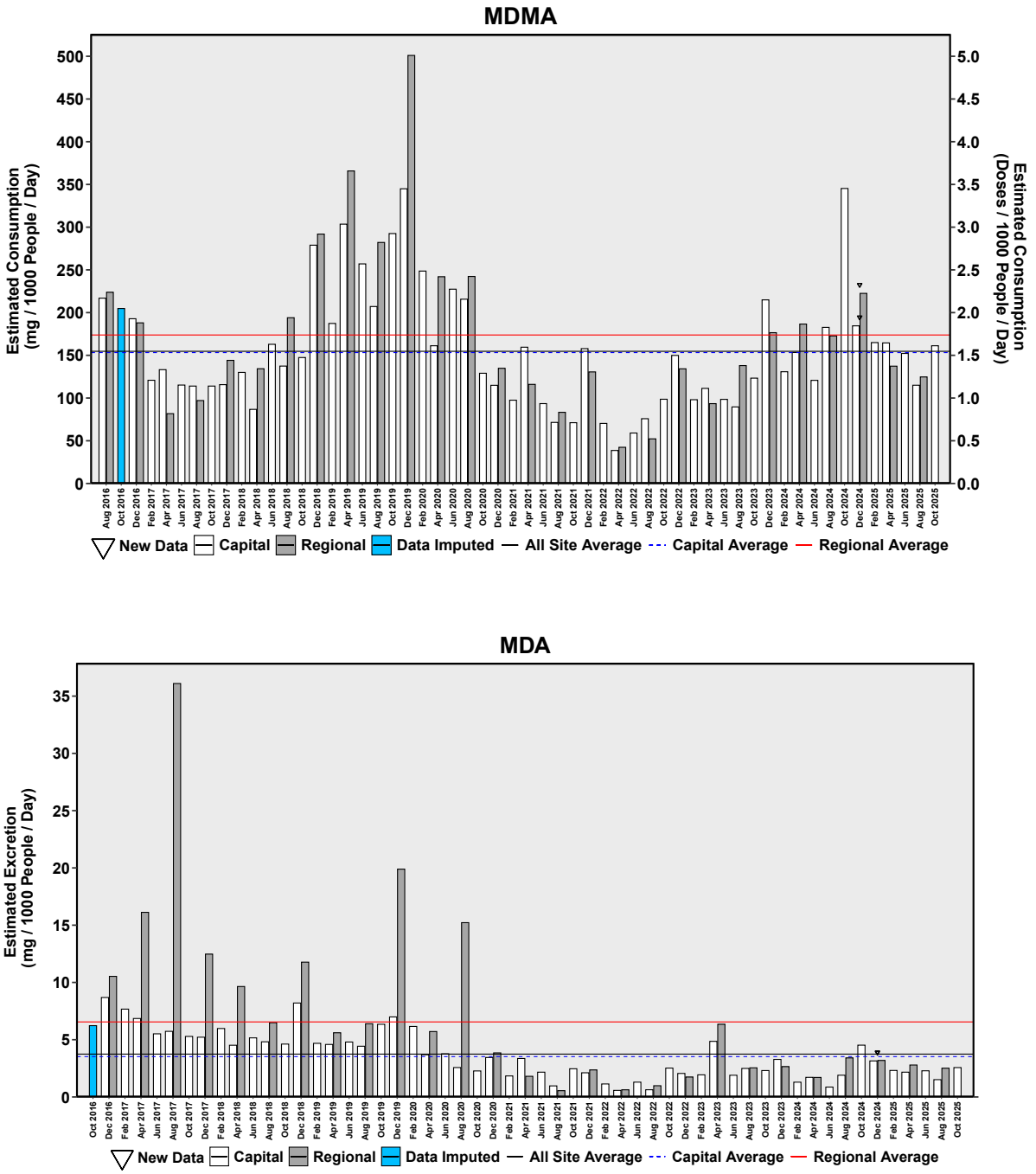
As Queensland and New South Wales capital city sites were not sampled in October 2016, their average consumption in August and December 2016 was used to provide the overall October estimate.

Figure 32: The population-weighted average of all sites for methylamphetamine and cocaine. The triangle above the data bars indicates where the new data from this report begins (6 periods for capital cities and 3 periods for regional areas).



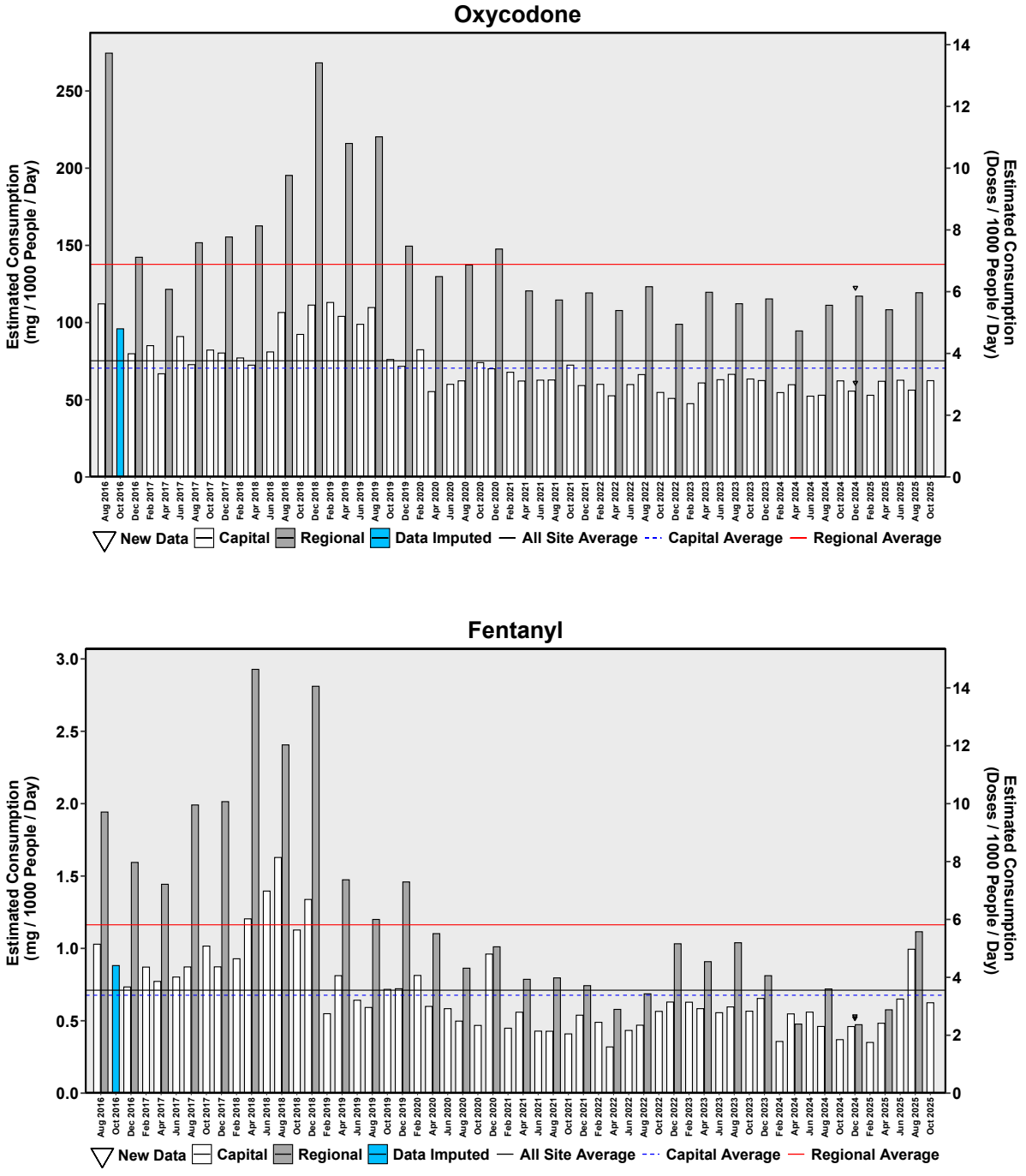
As Queensland and New South Wales capital city sites were not sampled in October 2016, their average consumption in August and December 2016 was used to provide the overall October estimate.

Figure 33: The population-weighted average of all sites for MDMA and MDA. The triangle above the data bars indicates where the new data from this report begins (6 periods for capital cities and 3 periods for regional areas).



As Queensland and New South Wales capital city sites were not sampled in October 2016, their average consumption in August and December 2016 was used to provide the overall October estimate.

Figure 34: The population-weighted average of all sites for oxycodone and fentanyl. The triangle above the data bars indicates where the new data from this report begins (6 periods for capital cities and 3 periods for regional areas).



As Queensland and New South Wales capital city sites were not sampled in October 2016, their average consumption in August and December 2016 was used to provide the overall October estimate.

Figure 35: The population-weighted average of all sites for heroin and cannabis. The triangle above the data bars indicates where the new data from this report begins (6 periods for capital cities and 3 periods for regional areas).

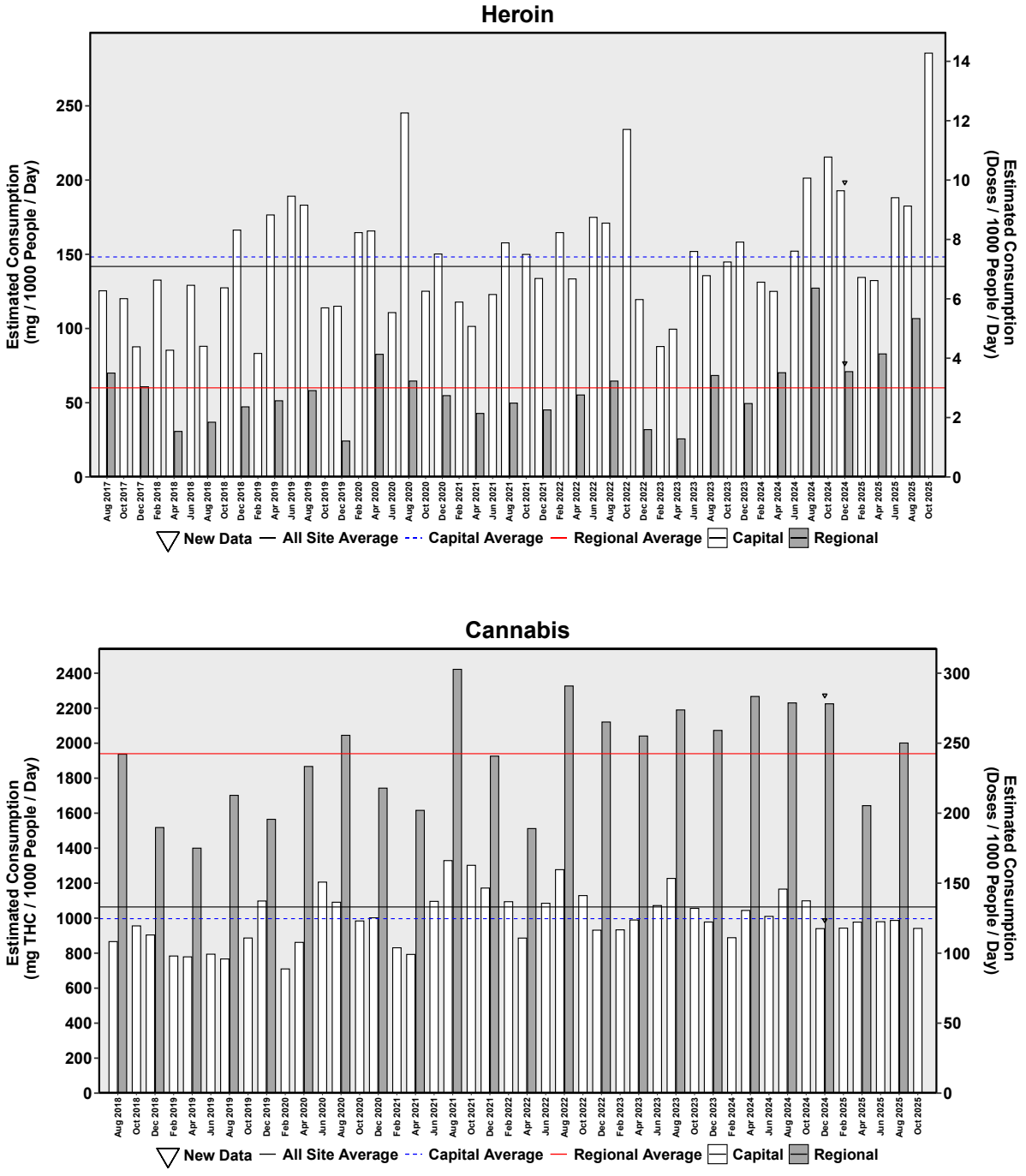
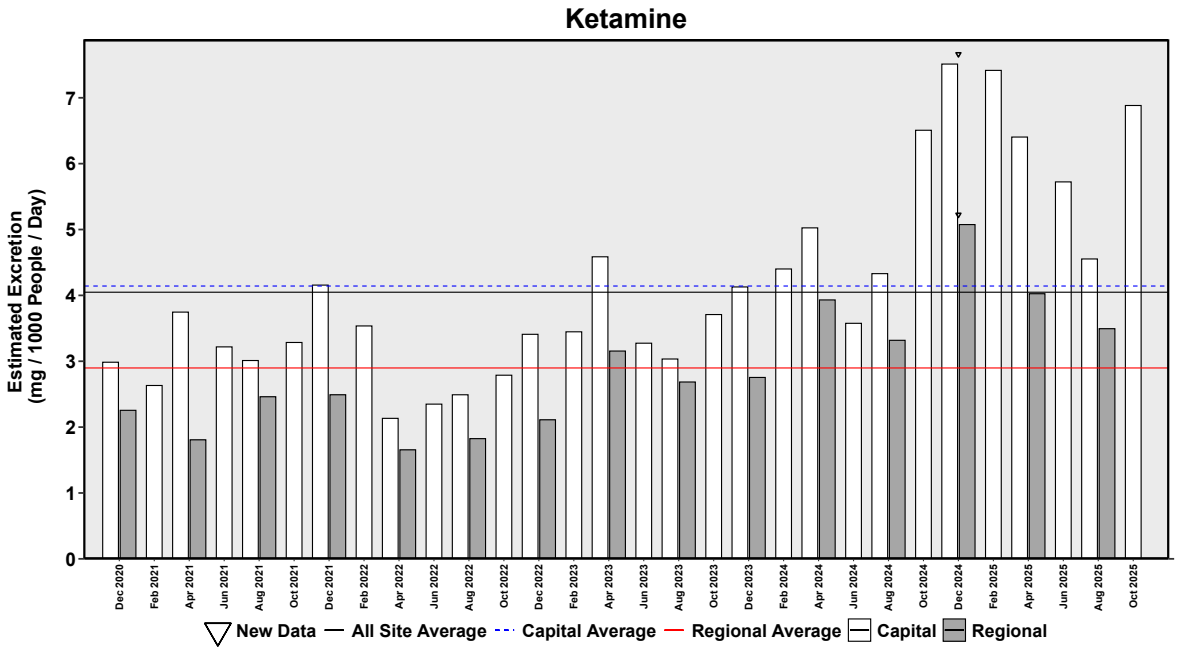


Figure 36: The population-weighted average of all sites for ketamine. The triangle above the data bars indicates where the new data from this report begins (6 periods for capital cities and 3 periods for regional areas).



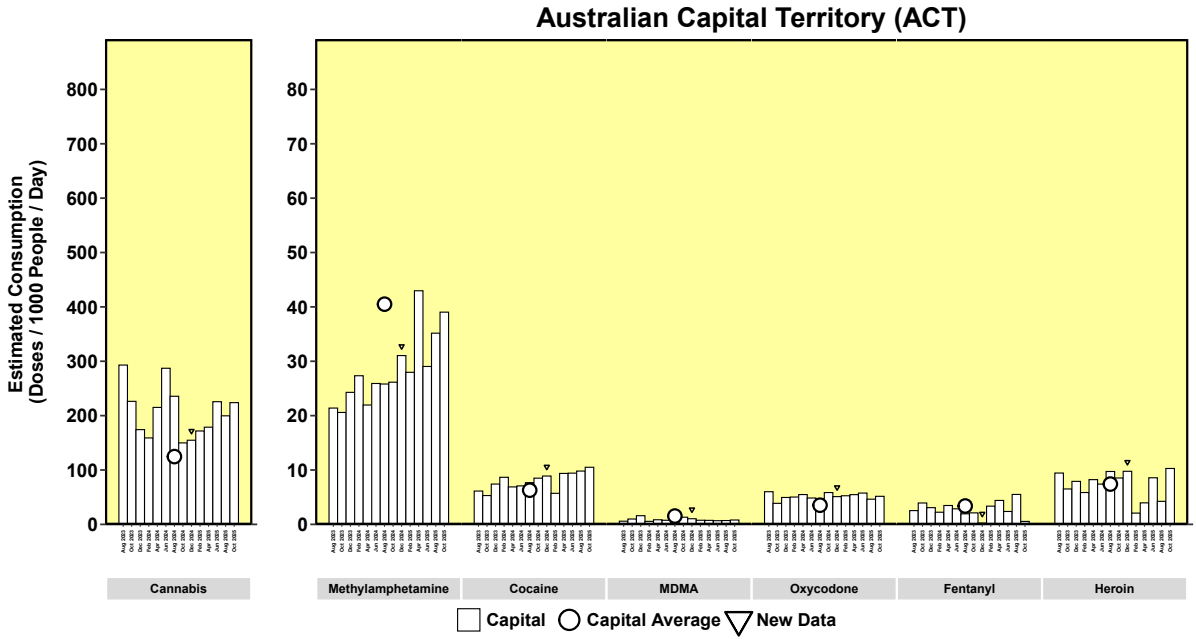
2.4 DRUG PROFILE FOR EACH STATE AND TERRITORY

Drug consumption is reported as the number of doses consumed to compare the scale of different drug consumption within the same region (for example, within a state or territory) and plotted on the same figure. In the absence of clear pharmacokinetic excretion data for MDA and ketamine, these compounds were excluded from this section as they are reported as the amount excreted.

The population-normalised dose amounts show that alcohol and nicotine are consistently the highest consumed substances in all states and territories (excretion factors listed in Appendix 1, and by comparing the right y axis values in graphs in sections 2.1 to 2.3). Due to the much higher doses consumed, these 2 substances are not included here.

In terms of the remaining substances with available dose information, cannabis ranked the highest in all jurisdictions (Figure 37 to Figure 40). The scale of cannabis consumption is substantially higher than the other substances included in the figures. Due to this, the graphs have been divided into 2 parts, so all drugs remain visible. Following cannabis, methylamphetamine is by far the next highest-ranking consumed drug included in the Program. Subsequent drug rankings differ by jurisdiction. Due to the large number of data bars included in each annual report we have added a visual aid (an upside-down triangle) to indicate where the new data added in this report begins.

Figure 37: Profile of average drug consumption by state or territory, August 2023 to October 2025 for Australian Capital Territory and New South Wales. Consumption is shown as the number of doses per 1,000 people per day to allow comparison of drugs of different types within the same state or territory. The circles represent the cumulative national capital or regional average of all time points for respective drugs. The triangle above the data bars indicates where the new data from this report begins (6 periods for capital cities and 3 periods for regional areas).



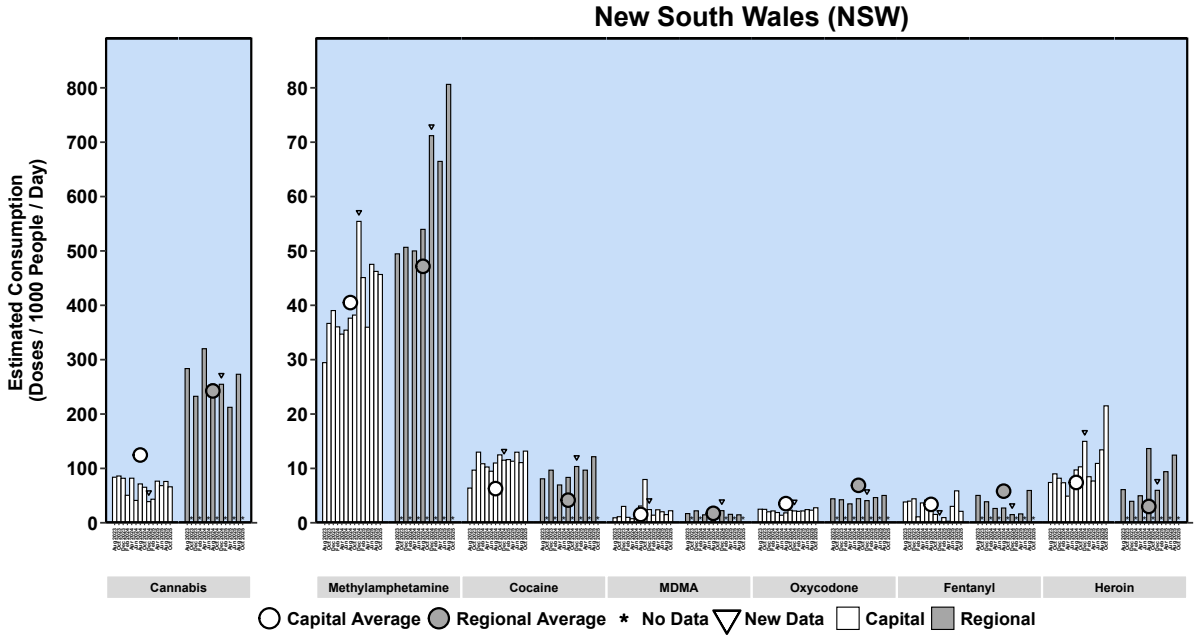
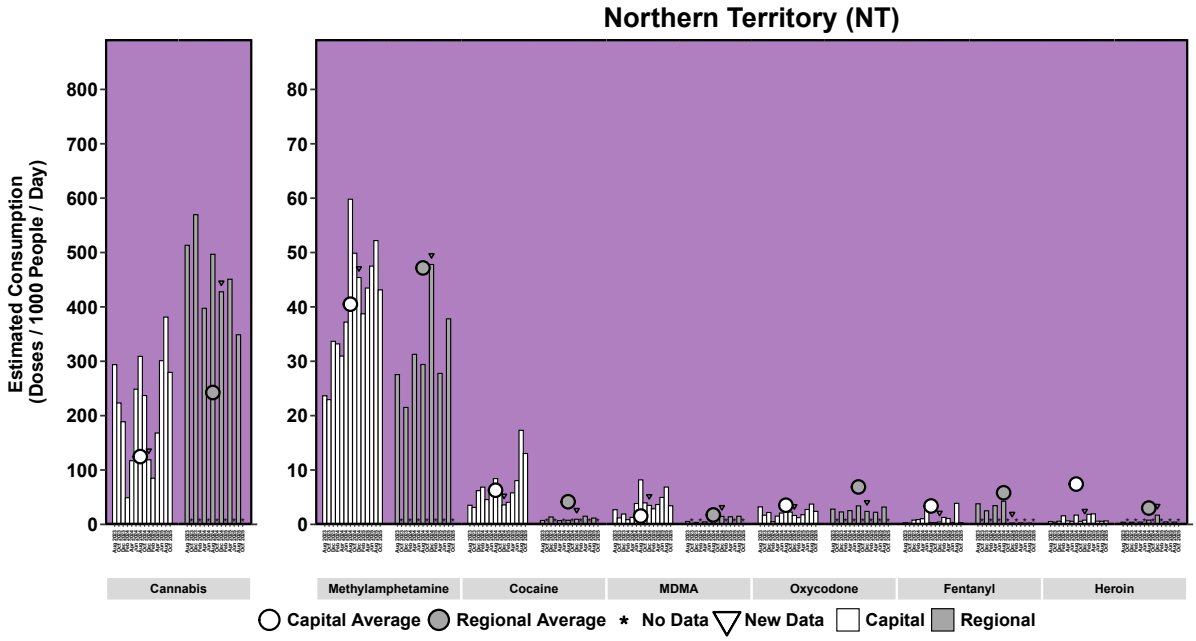


Figure 38: Profile of average drug consumption by state or territory, August 2023 to October 2025 for the Northern Territory and Queensland. Consumption is shown as the number of doses per 1,000 people per day to allow comparison of drugs of different types within the same state or territory. The circles represent the cumulative national capital or regional average of all time points for respective drugs. The triangle above the data bars indicates where the new data from this report begins (6 periods for capital cities and 3 periods for regional areas).



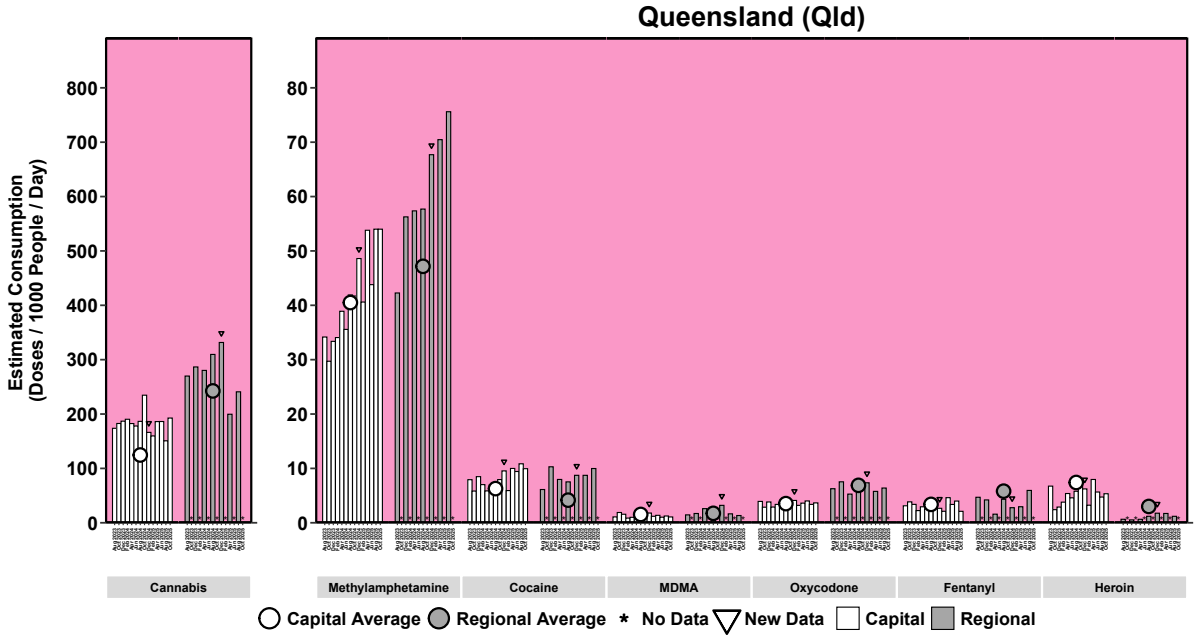
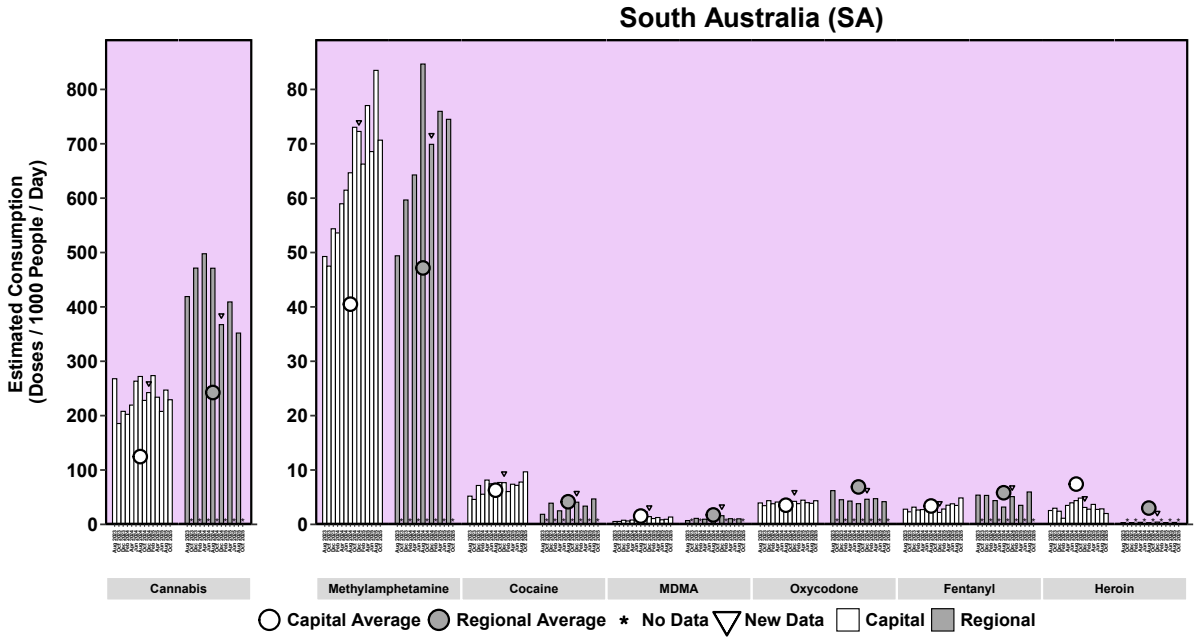


Figure 39: Profile of average drug consumption by state or territory, August 2023 to October 2025 for South Australia and Tasmania. Consumption is shown as the number of doses per 1,000 people per day to allow comparison of drugs of different types within the same state or territory. The circles represent the cumulative national capital or regional average of all time points for respective drugs. The triangle above the data bars indicates where the new data from this report begins (6 periods for capital cities and 3 periods for regional areas).



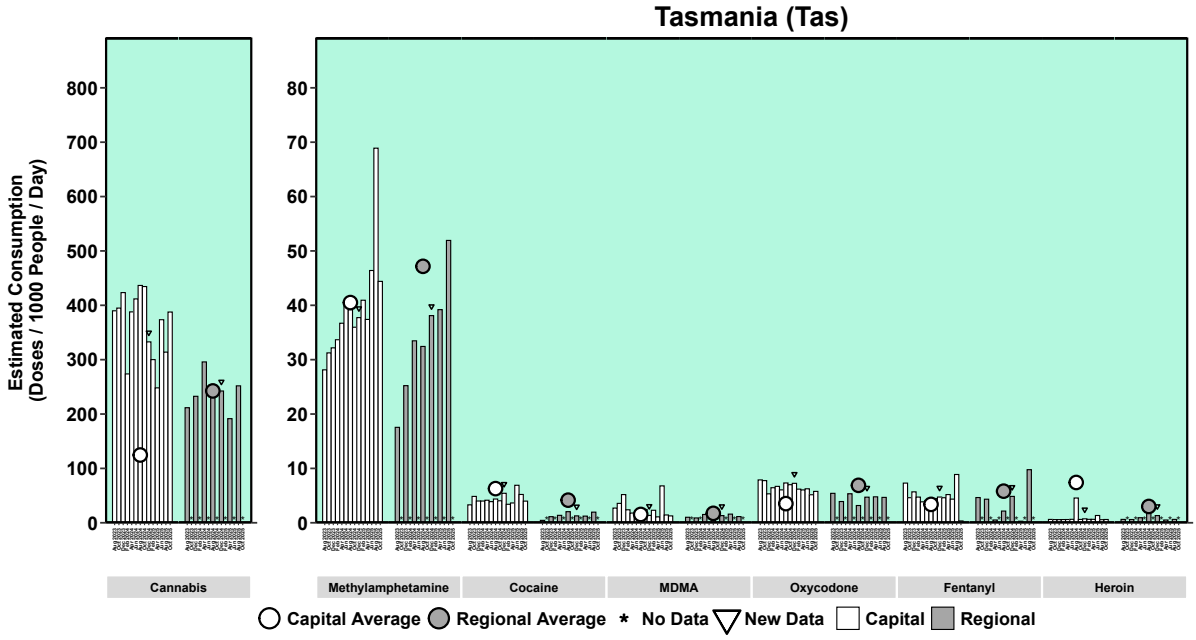
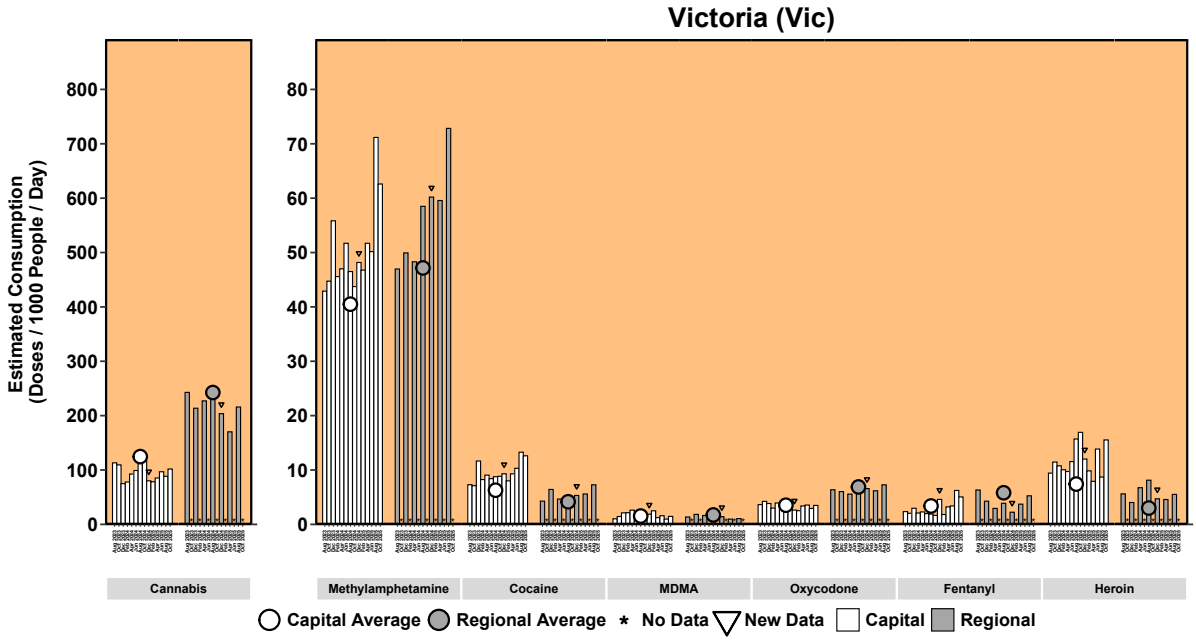
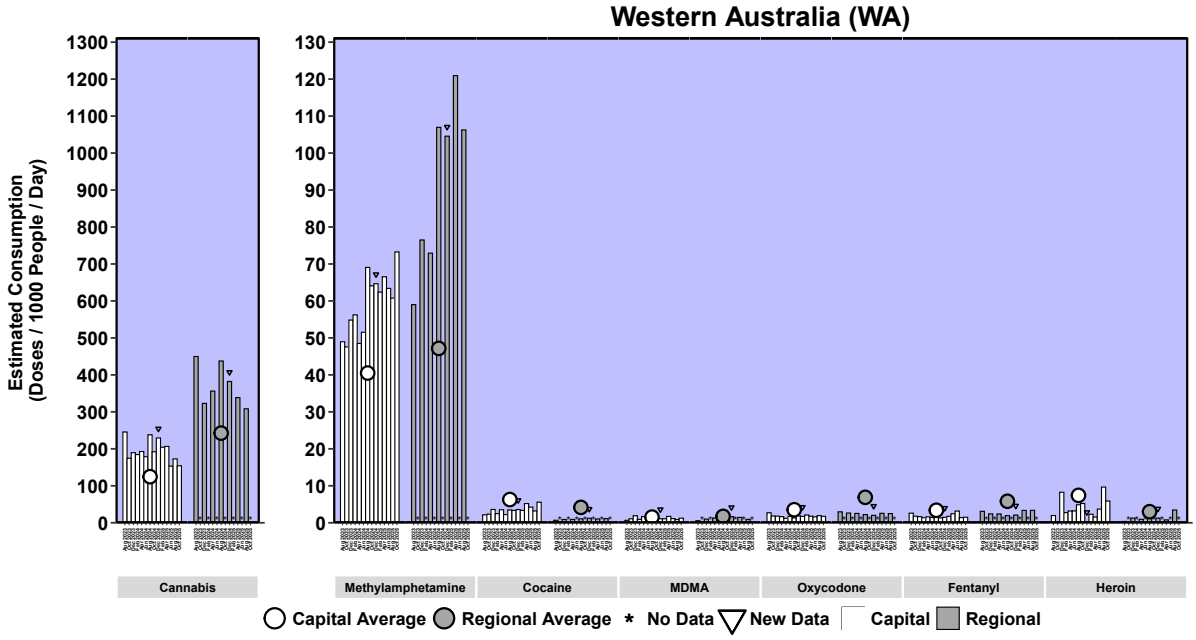


Figure 40: Profile of average drug consumption by state or territory, August 2023 to October 2025 for Victoria and Western Australia. Consumption is shown as the number of doses per 1,000 people per day to allow comparison of drugs of different types within the same state or territory. The circles represent the cumulative national capital or regional average of all time points for respective drugs. The triangle above the data bars indicates where the new data from this report begins (6 periods for capital cities and 3 periods for regional areas).





3: COMPARISONS WITH INTERNATIONAL DATA

3.1: BACKGROUND

Wastewater-based epidemiology has been standardised by a European network of laboratories focussed on quality sampling and analysis, called the Sewage Core Group Europe (SCORE). The SCORE network facilitates an annual inter-laboratory testing program among participating laboratories that research and measure illicit drugs in wastewater across the globe. SCORE is partially funded by the European Union Drugs Agency (EUDA; formerly the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA)). As part of this routine laboratory benchmarking, participating laboratories which pass analytical criteria are invited to submit 7 days of wastewater data for their region in roughly the same time period, thus ensuring the quality of the analysis and comparability of reported data. The research teams at the University of Queensland and Adelaide University have taken part and passed this testing regime for more than 5 years. As the methods are standardised internationally, this allows for the comparison of data between countries.

European data from this inter-laboratory testing regime were obtained from the SCORE network, as reported on the EUDA website. Most recent available data were from March and May 2024 from participating laboratories. Most sites were from Europe. SCORE reports their results as the amount of drug excreted in mg per day per 1,000 people, whereas the NWDMP converts these measures to consumption (either as mg consumed/day/1,000 people or doses consumed/day/1,000 people). To compare the same units, the SCORE data were converted to the NWDMP consumption estimates by applying the same excretion factors and doses used in the NWDMP. Similarly, the data for each site were aggregated by population-weighting each site to formulate the country average.

A comparison between the per-capita consumption of stimulants was made between Australia (from the NWDMP) and the recent SCORE study. While these comparisons are useful to evaluate the relative scale of consumption across several countries, it should be noted that comparisons need to be understood in the context of preferences and availability of drugs in different countries. For example, throughout many parts of Europe amphetamine is more commonly consumed than methylamphetamine, where in Australia methylamphetamine is more commonly consumed. Additionally, the latest SCORE data may relate to only a single site or city per country, so the data from one site might not necessarily be representative of drug consumption across the country.

3.2: RESULTS

Due to the difference in preferences for stimulant drugs, it may be useful to compare the total stimulant consumption between locations to account for these preferences. In Figure 41 cocaine, MDMA, methylamphetamine and amphetamine were summed as the number of doses/day/1,000 people to evaluate the total consumption of these 4 common stimulants. In the case of amphetamine, all data were adjusted for the expected fraction of the drug which is excreted following methylamphetamine consumption. The Australian data did not include amphetamine, as generally most amphetamine in the wastewater is accounted for from methylamphetamine metabolism. In some countries, including Australia, amphetamine (dexamfetamine, dextroamphetamine or lisdexamfetamine) can be prescribed for the treatment of ADHD and cannot be separated from the data. It should also be noted that not all sites measured for or detected all drugs, which may also limit the comparisons between some locations.

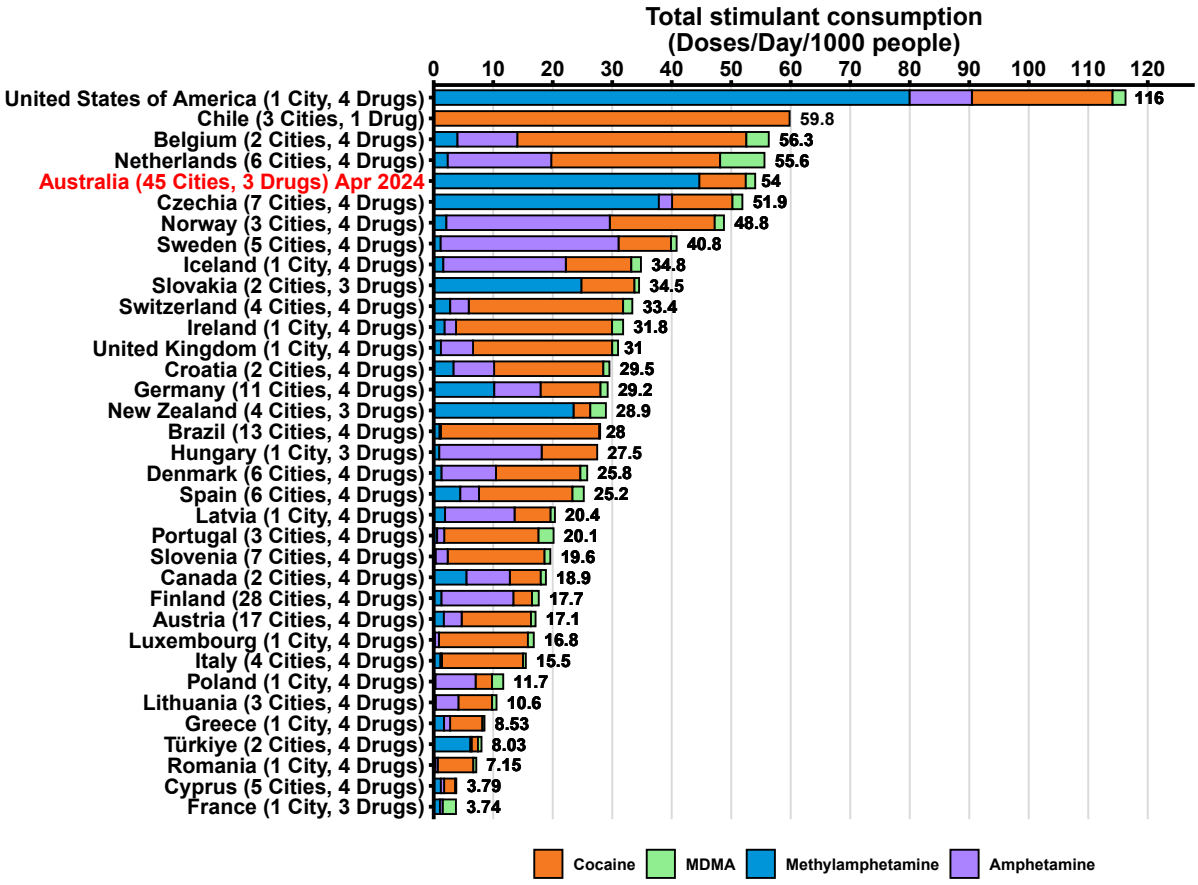
3.2.1 SPATIAL COMPARISONS

Australian results for April 2024 were used as a basis of comparison to the SCORE data collection (March-May 2024) due to temporal proximity.

Note: the international estimates are based on data of a few sites per country and therefore may not represent the national per capita consumption for a given drug in a specific country.

Australia ranked fifth highest in terms of combined stimulant consumption when compared to the SCORE dataset at 54 doses per day per 1,000 people (Figure 41).

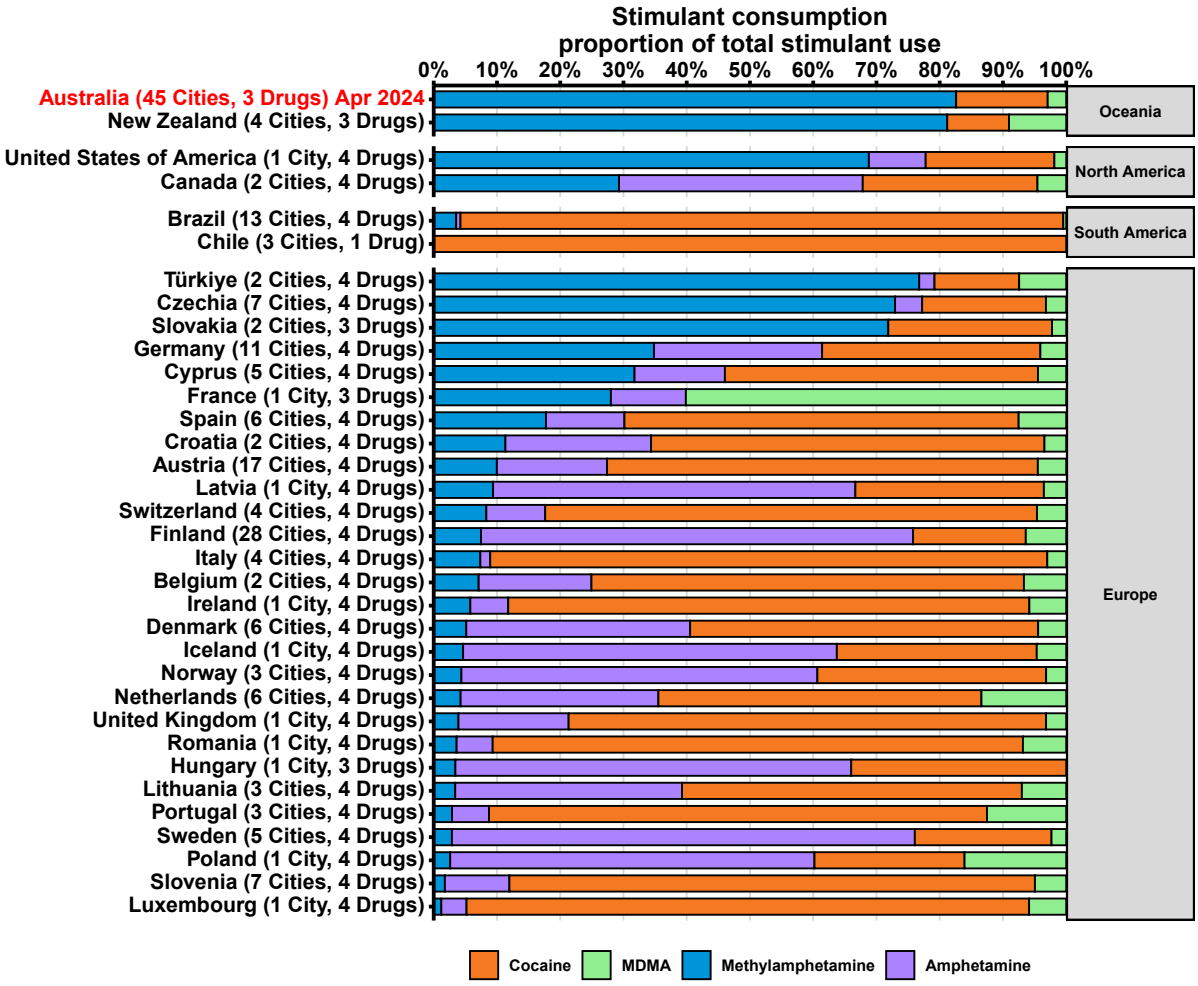
Figure 41: The total amount of stimulants consumed (as the population-weighted average doses per 1,000 people per day). Note the data labels are rounded to 3 significant figures: trailing zeros not shown.



The proportion that each of the 4 stimulants contributes to the total number of doses can be visualised a different way to reveal which of the drugs contribute most within each country. Figure 41 shows the same data as Figure 42 but with each drug scaled as a percentage of the total stimulants consumed within each country. This representation of the data (scaled to the same value of 100%) reveals the contribution of each drug to the total use, or drug profile, which can be compared between locations. The profile of stimulant consumption in Australia is heavily influenced by methylamphetamine, which comprises more than 80% of the 3 main illicit stimulants consumed, while for Western European countries it is mainly amphetamine or cocaine. Methylamphetamine was also the dominant stimulant in New Zealand, the United States of America (USA), Türkiye, Czechia

and Slovakia, while amphetamine was the dominant stimulant in Latvia, Finland, Iceland, Norway, Hungary, Sweden and Poland. Remaining countries either had similar consumption profiles among drugs, for example Canada with similar proportions of methylamphetamine, amphetamine and cocaine, or were mainly cocaine dominant. France was the only country where MDMA accounted for the highest proportion of stimulant consumption.

Figure 42: National population weighted average consumption for cities reported in the SCORE European study for methylamphetamine, MDMA, cocaine and amphetamine, represented as the proportion of the total stimulant consumption in each country. Note that some countries did not analyse for or detect all substances, noted in the left y axis label.



The high methylamphetamine consumption estimates in Australia were evident when compared with sites in the SCORE study (Figure 43). Methylamphetamine levels in Australia (45 doses/day/1,000 people in April 2024) were the second highest behind the site in the USA (80 doses/day/1,000 people). Some countries with reasonably high methylamphetamine consumption according to police actions or research papers, such as in Asia and other parts of the Americas, are not represented here. Amphetamine data is shown for relevant countries in Figure 44.

Figure 43: National population weighted average consumption of methylamphetamine in SCORE data and Australia.

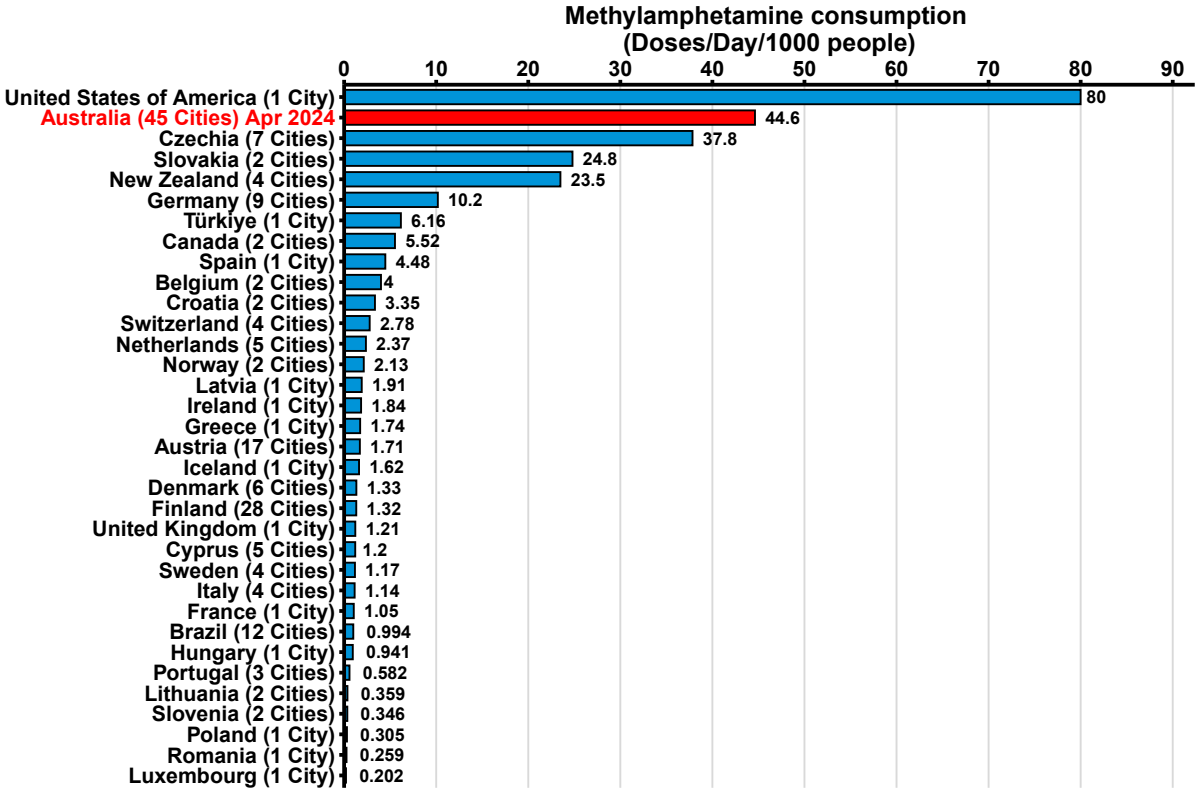
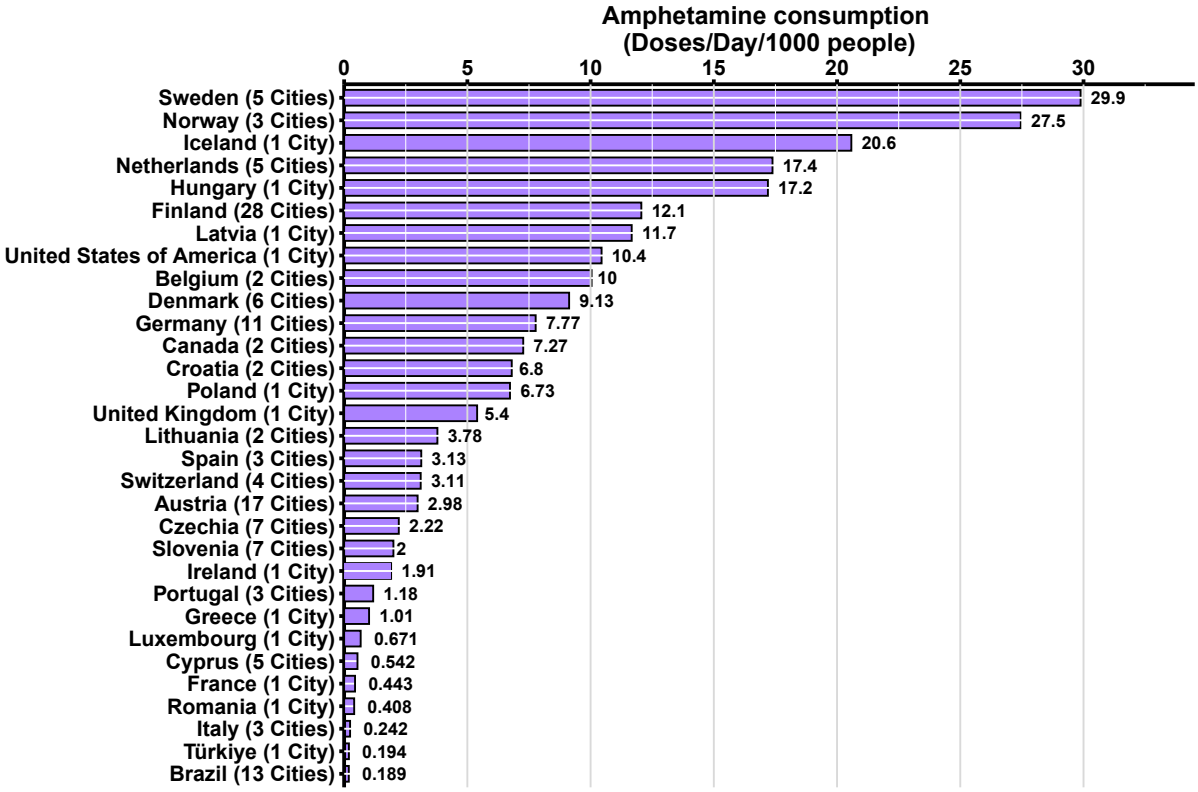


Figure 44: National population weighted average consumption of amphetamine in SCORE data.



Australian data were also compared to the SCORE dataset for cocaine (Figure 45) and MDMA (Figure 46). Australian cocaine consumption was towards the lower end (7.8 doses/day/1,000 people) and well below the highest consumption observed in Chile, Belgium, The Netherlands, Brazil, Ireland and Switzerland which all had estimates greater than 25 doses/day/1,000 people. Australian MDMA consumption ranked towards the middle to higher end of the SCORE sites (1.6 doses/day/1,000 people in April 2024).

Figure 45: National population weighted average consumption of cocaine in SCORE data and Australia.

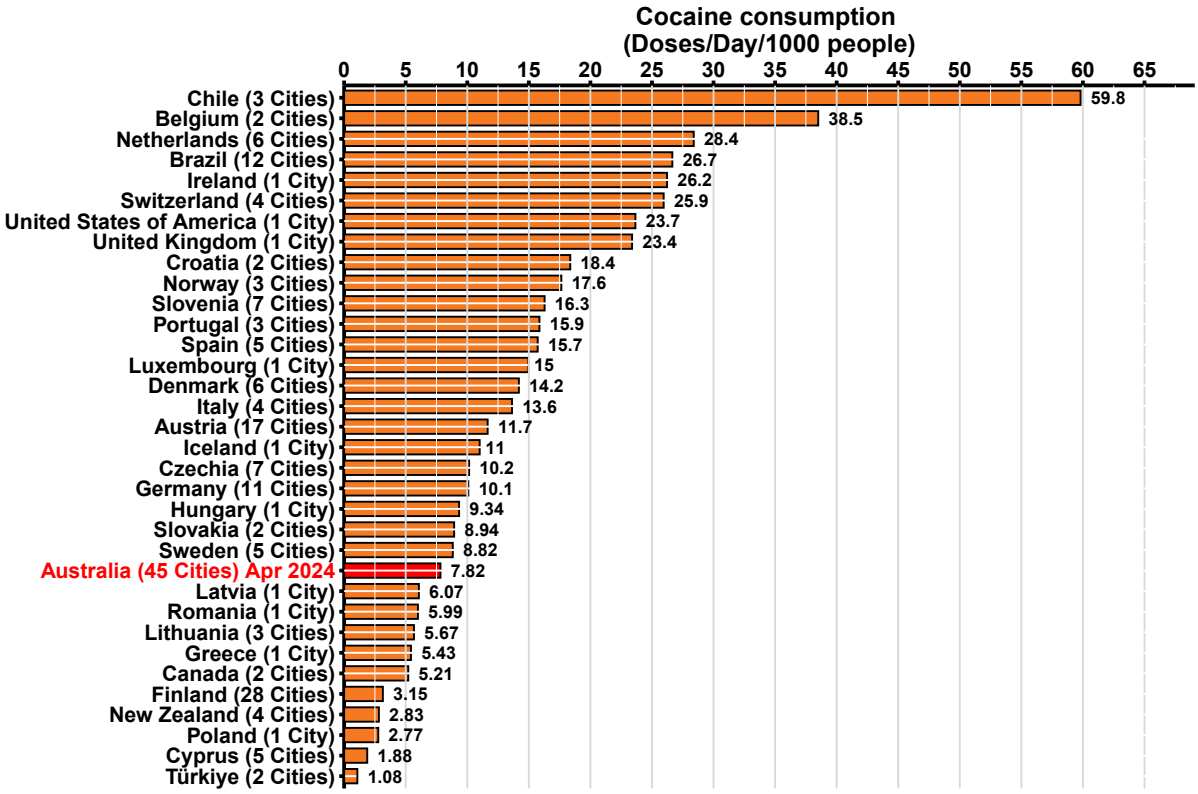
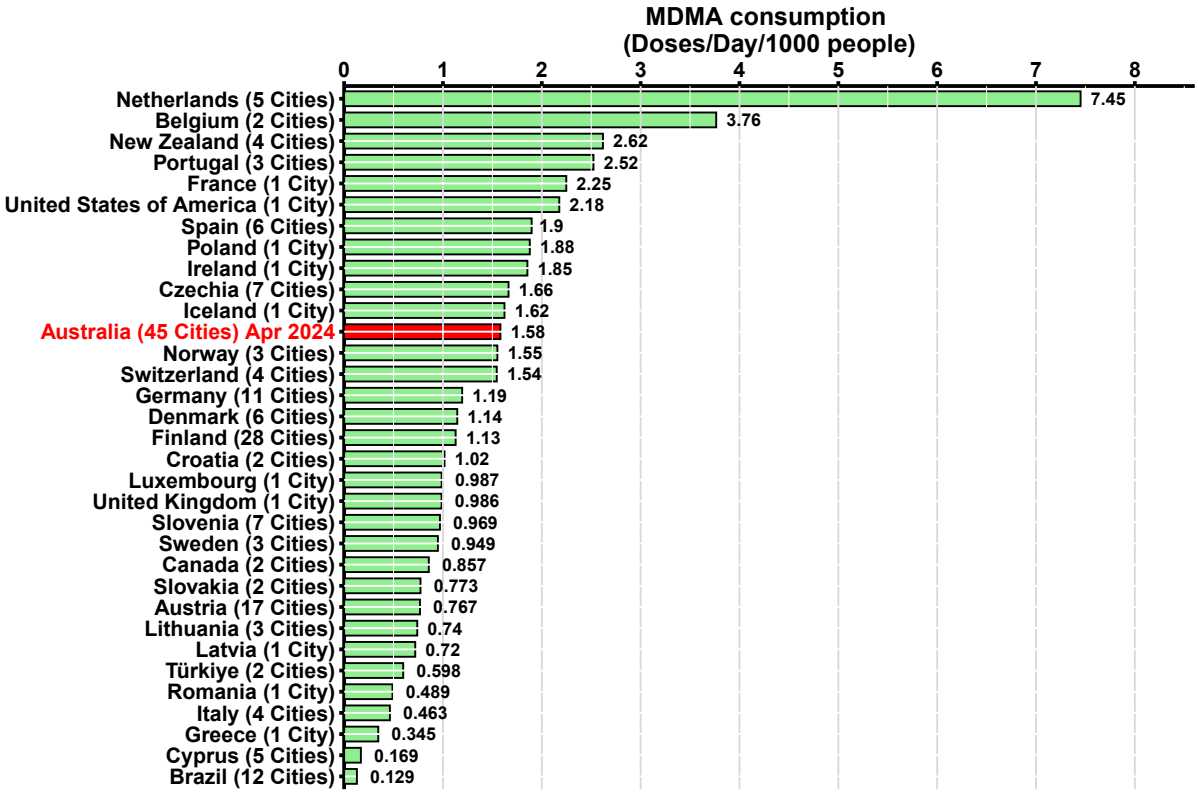
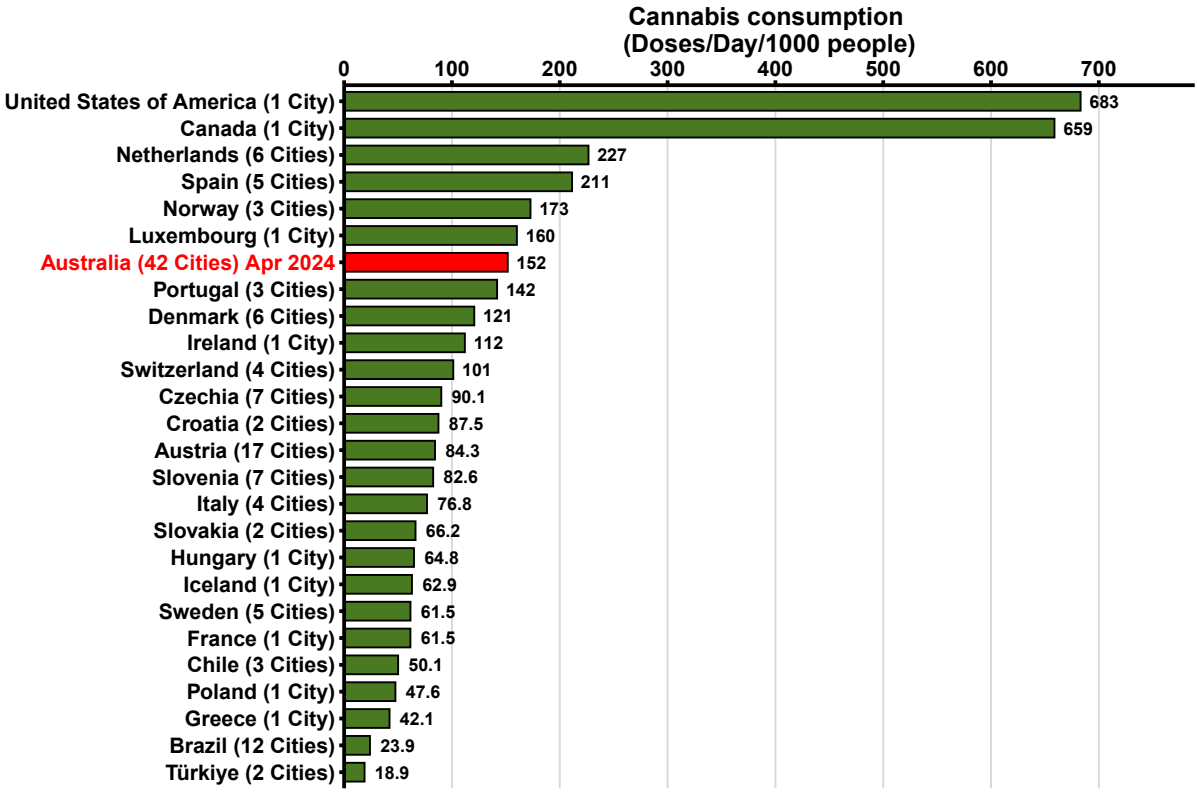


Figure 46: National population weighted average consumption of MDMA in SCORE data and Australia.



Australian data was compared with cannabis consumption from 25 countries (Figure 47). Caution should be applied when comparing between data as the legal status of cannabis varies between countries and even within countries. Therefore, participating cities may not be representative of countries as a whole. Of the 25 countries, Australia (152 doses/day/1,000 people in April 2024) ranked 7th, with the USA and Canada recording the highest consumption (683 and 659 doses/day/1,000 people respectively) .

Figure 47: National population weighted average consumption of cannabis in SCORE and Australian datasets.



4: ACKNOWLEDGEMENTS

The project team sincerely thanks the numerous WWTP operators involved in sample collection and WWTP management agencies for providing flow volumes and site information. The cooperation of the plants and management agencies is critical to the ongoing success of this project.

Adelaide University would like to thank our funding partners, the Drug and Alcohol Services South Australia (DASSA) and Preventative Health SA, for their permission to consumption historical and current data from South Australia. The University of Queensland thanks the research staff and PhD students at The Queensland Alliance for Environmental Health Sciences (QAEHS) for their assistance for sample processing. We also thank the members at QAEHS for assistance with preparing and shipping sampling bottles to the various plants, and those members, past and present, who helped establish this field at the university. QAEHS would like to acknowledge the financial support of the Queensland Department of Health.

We also would like to acknowledge the wider wastewater-based epidemiology field which includes addiction specialists, analytical chemists, environmental engineers, forensic scientists, pharmacologists, policy advisors and sewer engineers for their ongoing contributions to knowledge, willingness to share both methodology and data, critical review and for advancing wastewater analysis research.

The symbols/images used in Figure 48 in the report were provided courtesy of the Integration and Application Network, University of Maryland, Center for Environmental Science (ian.umces.edu/symbols/).

5: APPENDICES

APPENDIX 1: DRUG-SPECIFIC PARAMETERS FOR ANALYTICAL REPORTING AND USAGE CALCULATIONS

Analyte levels of detection, levels of reporting, highest detection, excretion factors and standard doses from the literature.

Analyte/metabolite	Drug	Limit of detection (LOD) [ng/L]	Limit of quantification (LOQ) [ng/L]	Excretion factor	Standard dose pure drug (mg)
Amphetamine	Amphetamine	12	16	0.394[a]	30[b]
Cocaine	Cocaine	17	50	0.075[b]	100[b]
Cotinine	Nicotine	33	100	0.3[c]	1.25[c]
Norfentanyl	Fentanyl	0.1	0.1	0.3[d]	0.2[d]
MDA *	MDA	1	4	n.a.	n.a.[#]
MDMA	MDMA	1.5	2	0.225[b]	100[b]
Mephedrone	Mephedrone	0.4	0.8	n.a.	n.a.
Methylamphetamine	Methylamphetamine	33	100	0.39[g]	30[b]
Methylone	Methylone	0.01	0.1	n.a.	n.a.
Hydroxycotinine	Nicotine	17	50	0.44[c]	1.25[c]
Noroxycodone	Oxycodone	0.1	1	0.22[f]	20[d]
Ethyl Sulphate	Alcohol (ethanol)	167	500	0.00012[e]	10[ge]
Benzoylecgonine	Cocaine	33	100	0.35[g]	100[b]
6-Monoacetylmorphine	Heroin	0.5	1.0	0.013[h]	20[i]
THC-COOH	THC (Cannabis)	30	180	0.1[##]	8[**]
Norketamine	Ketamine	1	2	n.a.[^]	n.a.

n.a. = data not available; a = (Khan and Nicell 2012); b = (Zuccato et al. 2008); c = (Castiglioni et al. 2015); d = (Rossi 2016); e = (Ryu et al. 2016); f = (Lalovic et al. 2006); g = (Lai et al. 2011); h = (Boerner et al. 1975); i = (Sullivan et al. 2006).

* Data is not available in the scientific literature for the proportion of MDA that is eliminated following MDA consumption. However, data is available detailing the proportion of MDA eliminated after MDMA consumption. Therefore, our MDA estimate of mg excreted per day per 1,000 people is the amount of MDA excreted from the population after considering the metabolic fraction excreted from MDMA.

\# It is likely that the dose for MDA is similar to that of MDMA, or 100 mg.

^ Ketamine is excreted as norketamine and several conjugated metabolites. As the level of conjugation is not well known and conjugated metabolites (e.g., glucuronides) are likely to deconjugate in the sewer, a ketamine excretion rate has not been assigned at this time. Once the impact of in-sewer deconjugation is known, this will be revised.

** A dose of 8 mg THC has been suggested to provide the desirable effect for the average user, regardless of the route of administration (Freeman and Lorenzetti, 2020). This takes into consideration that not all the available THC in a joint or edibles is inhaled or absorbed by the lung or the intestine and enters the blood stream.

Between 23% (edibles) and 31% (smoked) of an ingested dose of cannabis is excreted in faeces as the metabolite, THC-COOH, and another 3% in urine in free or conjugated form (Wall and Perez-Reyes, 1981). Recent research shows that the particulate fraction of wastewater can contain upwards of 40% of the total excreted THC-COOH load (Campos-Manas et al, 2022). Experiments by the authors of this report on wastewater from around Australia show that the water-soluble fraction of THC-COOH on average is about 33% of the total load, inclusive of the bound glucuronide which deconjugates in the sewer. Therefore, a correction factor of 10% has been applied in this report to convert the measured excreted load to consumed amounts. This number was derived as follows: of THC consumed, 30% enters the sewer as THC-COOH (Wall and Perez-Reyes, 1981). This load partitions with approximately 67% adsorbed to particulates and 33% dissolved in the water fraction on average (unpublished data). Therefore, the measured amount in water represents 10% of the original amount of THC consumed. This approach represents a reasonable average based on local data and may need to be refined further as more research becomes known. It should not be considered a universal correction factor for cannabis due to the differences between wastewater and infrastructure in other countries.

APPENDIX 2: SAMPLING DETAILS OF EACH SITE

Sites	Location	Dec 2024	Feb 2025	Apr 2025	Jun 2025	Aug 2025	Oct 2025	Population
ACT: 009	Capital	7	7	7	7	7	7	> 150,000
NSW: 021	Capital	–	–	–	–	7	–	30,000 to 150,000
NSW: 003	Capital	7	7	7	7	7	7	> 150,000
NSW: 006	Capital	7	7	7	7	7	7	> 150,000
NSW: 071	Capital	–	–	–	–	7	–	> 150,000
NSW: 008	Capital	7	7	7	7	7	7	> 150,000
NSW: 115	Regional	7	–	7	–	7	–	30,000 to 150,000
NSW: 016	Regional	7	–	–	–	7	–	30,000 to 150,000
NSW: 163	Regional	7	–	7	–	7	–	< 30,000
NSW: 164	Regional	7	–	7	–	7	–	< 30,000
NSW: 165	Regional	7	–	7	–	7	–	< 30,000
NSW: 025	Regional	7	–	7	–	7	–	> 150,000
NSW: 040	Regional	–	–	–	–	7	–	< 30,000
NSW: 051	Regional	–	–	–	–	7	–	< 30,000
NSW: 068	Regional	7	–	7	–	7	–	> 150,000
NSW: 081	Regional	7	–	7	–	7	–	< 30,000
NT: 010	Capital	7	7	7	7	7	7	30,000 to 150,000
NT: 078	Regional	7	–	7	–	7	–	< 30,000
Qld: 011	Capital	7	7	–	7	7	–	> 150,000
Qld: 002	Capital	7	7	7	7	7	7	> 150,000
Qld: 005	Capital	7	7	7	7	7	7	> 150,000
Qld: 012	Regional	7	–	7	–	6	–	> 150,000
Qld: 020	Regional	–	–	–	–	–	–	< 30,000
Qld: 024	Regional	7	–	7	–	7	–	30,000 to 150,000
Qld: 028	Regional	7	–	7	–	7	–	30,000 to 150,000
Qld: 029	Regional	7	–	7	–	7	–	30,000 to 150,000
Qld: 033	Regional	7	–	7	–	7	–	30,000 to 150,000
Qld: 039	Regional	5	–	5	–	7	–	< 30,000
Qld: 042	Regional	7	–	7	–	7	–	30,000 to 150,000
Qld: 053	Regional	7	–	7	–	7	–	< 30,000
Qld: 077	Regional	7	–	7	–	7	–	< 30,000
Qld: 092	Regional	–	–	–	–	–	–	< 30,000
SA: 013	Capital	7	7	7	7	7	7	> 150,000
SA: 027	Capital	7	7	7	7	7	7	30,000 to 150,000
SA: 059	Capital	7	7	7	7	7	7	> 150,000
SA: 007	Capital	7	7	7	7	7	–	> 150,000
SA: 119	Regional	7	–	7	–	7	–	< 30,000
SA: 017	Regional	7	–	7	–	7	–	< 30,000
SA: 022	Regional	7	–	7	–	7	–	< 30,000
SA: 063	Regional	7	–	7	–	7	–	< 30,000
SA: 076	Regional	7	–	7	–	7	–	< 30,000

APPENDIX 2 (CONTINUED)

Sites	Location	Dec 2024	Feb 2025	Apr 2025	Jun 2025	Aug 2025	Oct 2025	Population
Tas: 019	Capital	5	5	5	5	5	5	30,000 to 150,000
Tas: 004	Capital	5	5	5	5	5	5	< 30,000
Tas: 041	Capital	5	5	5	5	5	5	< 30,000
Tas: 018	Regional	5	–	5	–	5	–	30,000 to 150,000
Tas: 038	Regional	–	–	–	–	–	–	< 30,000
Tas: 048	Regional	5	–	5	–	5	–	< 30,000
Tas: 058	Regional	–	–	–	–	–	–	< 30,000
Vic: 001	Capital	7	7	7	7	7	7	> 150,000
Vic: 067	Capital	7	7	7	7	7	7	> 150,000
Vic: 114	Regional	7	–	7	–	7	–	30,000 to 150,000
Vic: 121	Regional	7	–	7	–	7	–	< 30,000
Vic: 122	Regional	7	–	7	–	7	–	< 30,000
Vic: 123	Regional	–	–	–	–	–	–	< 30,000
Vic: 124	Regional	–	–	–	–	–	–	< 30,000
Vic: 125	Regional	7	–	7	–	7	–	30,000 to 150,000
Vic: 155	Regional	7	–	7	–	7	–	30,000 to 150,000
Vic: 156	Regional	6	–	6	–	7	–	< 30,000
Vic: 037	Regional	7	–	7	–	7	–	> 150,000
Vic: 046	Regional	7	–	7	–	7	–	30,000 to 150,000
Vic: 061	Regional	7	–	7	–	7	–	30,000 to 150,000
Vic: 062	Regional	7	–	7	–	7	–	< 30,000
Vic: 066	Regional	7	–	7	–	7	–	30,000 to 150,000
WA: 101	Capital	7	7	7	7	7	7	> 150,000
WA: 103	Capital	7	7	7	7	7	7	> 150,000
WA: 104	Capital	7	7	–	7	7	7	> 150,000
WA: 102	Regional	7	–	7	–	7	–	30,000 to 150,000
WA: 116	Regional	7	–	7	–	7	–	< 30,000
WA: 118	Regional	–	–	–	–	–	–	< 30,000
WA: 120	Regional	7	–	7	–	7	–	< 30,000
WA: 129	Regional	7	–	–	–	7	–	< 30,000
Regional Sites		40	–	38	–	42	–	
Capital Sites		20	20	18	20	22	18	
Total Sites		**60**	**20**	**56**	**20**	**64**	**18**	
Regional Sites		273	–	259	–	289	–	
Capital Samples		134	134	120	134	148	120	
Total Samples		**407**	**134**	**379**	**134**	**437**	**120**	
Cumulative Samples		**12,676**	**12,810**	**13,189**	**13,323**	**13,760**	**13,880**	

APPENDIX 3: PROPORTION OF SAMPLES ABOVE LOD (%) FOR EACH DRUG AND PERIOD ASSESSED[4]

Drug	Location	Dec 2024	Feb 2025	Apr 2025	Jun 2025	Aug 2025	Oct 2025
Alcohol	Capital	100	100	100	100	100	100
Alcohol	Regional	100	–	100	–	100	–
Amphetamine	Capital	98	100	100	100	99	100
Amphetamine	Regional	97	–	100	–	97	–
Cannabis	Capital	100	100	100	100	100	100
Cannabis	Regional	100	–	100	–	100	–
Cocaine	Capital	100	99	100	100	100	100
Cocaine	Regional	97	–	99	–	97	–
Fentanyl	Capital	63	71	65	84	76	54
Fentanyl	Regional	59	–	50	–	75	–
Heroin	Capital	67	83	82	81	84	82
Heroin	Regional	55	–	52	–	66	–
Ketamine	Capital	100	100	100	100	100	100
Ketamine	Regional	92	–	88	–	88	–
MDA	Capital	96	97	90	90	89	100
MDA	Regional	92	–	81	–	80	–
MDMA	Capital	100	100	100	100	100	100
MDMA	Regional	98	–	99	–	99	–
Methylamphetamine	Capital	100	100	100	100	100	100
Methylamphetamine	Regional	100	–	100	–	100	–
Nicotine	Capital	100	100	100	100	100	100
Nicotine	Regional	100	–	100	–	100	–
Oxycodone	Capital	100	100	100	100	100	100
Oxycodone	Regional	100	–	100	–	99	–

4 Percentage detections for previous collection periods are available in Appendix 4 of Report 6 and Appendix 3 of Reports 7 to 24.

APPENDIX 4: METHODS

Wastewater-based monitoring of drug consumption is based on the principle that any substance that is consumed (irrespective of whether it is swallowed, inhaled/smoked, or injected) is excreted in urine or faeces. This may be either in the chemical form it was consumed and/or in a chemically modified form that is referred to as a metabolite. Once the excreted substance or metabolite is flushed into the sewer network, it will arrive at a wastewater treatment plant, assuming the point of excretion forms part of a wastewater catchment (Figure 48).

Information on the current drug list and their metabolites of interest are described in Appendix 1. The first NWDMP report (available on the ACIC website) also provides an in-depth description of the methodologies and calculations used. Collectively, waste products in the sewer system arrive at a WWTP. There, samples can be collected over a defined sampling period, typically sub-sampled over the course of a day. First, the concentration of target substance in the wastewater sample is measured in the samples. Next, information on the amount of wastewater entering the WWTP, the population serviced by the plant, as well as information about the substance metabolism are used to calculate consumption estimates. Estimates have units of mass (milligrams) per day per 1,000 people (mg/day/1,000 people) or doses per day per 1,000 people (doses/day/1,000 people). Sites of different land area can be compared directly when estimates are expressed per 1,000 population. As many thousands of people contribute to each sample, it is not possible to identify drug consumption from individuals. The method is considered non-invasive and privacy is ensured.

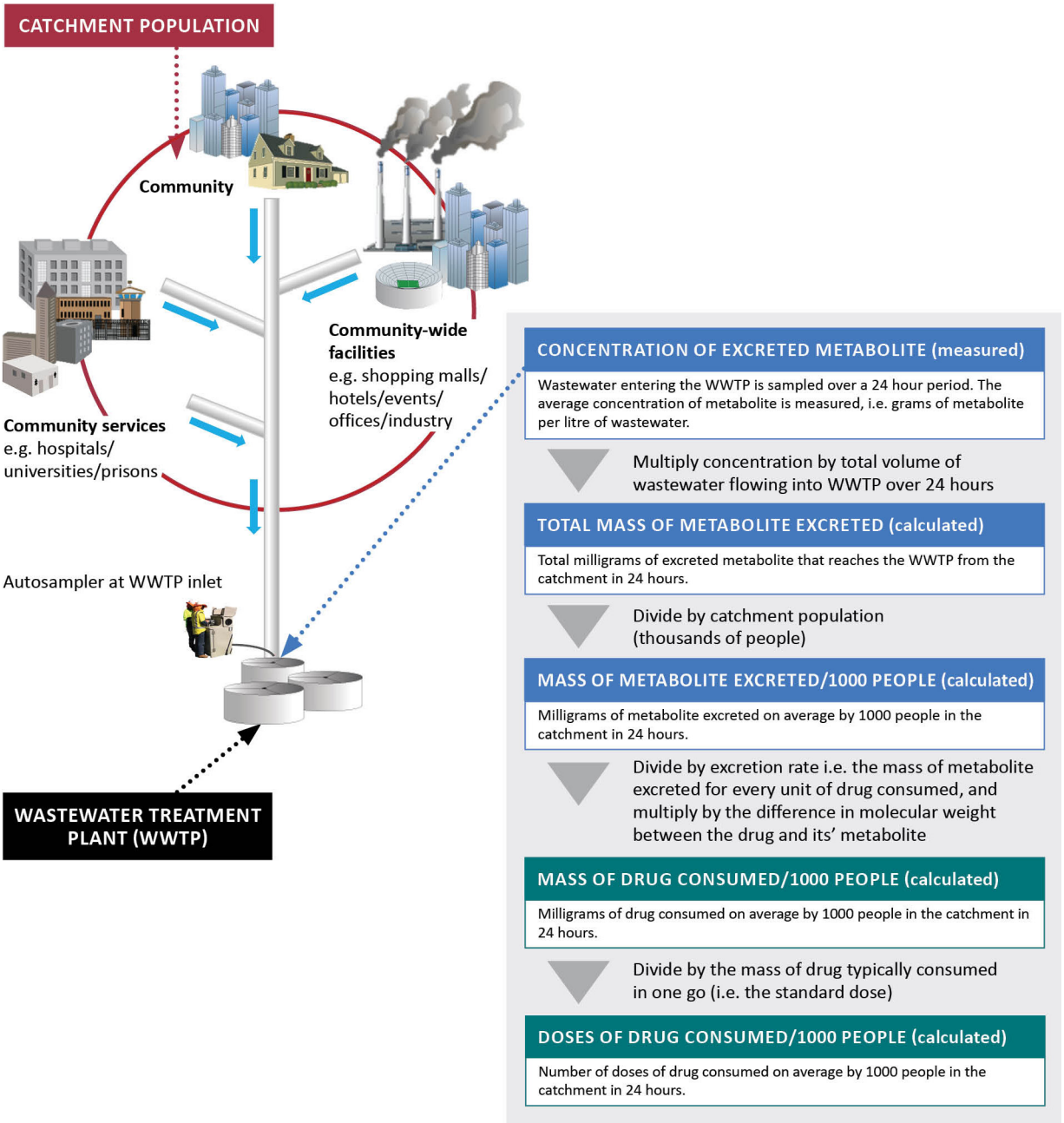
After their consumption, drugs can either pass through the body unchanged, or get converted into metabolites. Methylamphetamine is partially metabolised and excreted as amphetamine, while part of a MDMA dose is converted to MDA. The relationships between these compounds have been well studied and have been accounted for in this report (Pizarro et al. 2002; Khan & Nicell 2011). MDA is a drug but also a metabolite of MDMA. Since the proportion of MDA excreted after MDMA consumption is known, the proportion of MDA coming from MDMA metabolism was subtracted from the total measured amount of MDA. Similar calculations are conducted for methylamphetamine and amphetamine, where amphetamine coming from methylamphetamine consumption is subtracted from the total amount of amphetamine. Due to the lack of information concerning MDA elimination following MDA ingestion, consumption estimates cannot be calculated, so MDA is reported as excretion. Similar to MDA, ketamine results are also reported as the amount (mg) of drug excreted per day per 1,000 people as no suitable scientific information is available to convert amounts excreted to amounts consumed in wastewater.

After wastewater containing the drugs and their metabolites transits the sewer, samples are collected at the inlet of a wastewater treatment plant over 24 hours using autosamplers that collect time or flow proportional samples. Wastewater treatment plant operators aid with collecting the samples from the influent autosampler. Each sample is then preserved using 2 different preservatives to prevent decay of the drugs or their metabolites and kept frozen until analysis.

Wastewater samples are then sent frozen via overnight courier to analytical labs at Adelaide University and The University of Queensland laboratories where they are analysed. The steps include filtration of the samples followed by an enrichment or concentration step. Sample extracts are then injected into the analytical instruments to determine the concentration of each of the specific drugs or metabolites. Some drugs are at high enough concentrations that a concentration step is not necessary and are directly injected into the instrumentation. The instrumental analysis consists of chromatographic separation and compound specific detection by Liquid Chromatography

Mass Spectrometry (LC-MS/MS). A summary of the extraction and analytical methods is given in Report 1. Methods to extract and analyse the cannabis metabolite are outlined in Tscharke et al. (2016). The excretion and dose information used in the calculations can be found in Appendix 1. Drug consumption estimates for each catchment population were calculated from these measured concentrations using daily flow volumes provided by the wastewater treatment plants and estimates of the catchment population size by evaluating census data vs. catchment maps, together with excretion and dose data on the drugs of interest obtained from the scientific literature (Figure 48).

Figure 48: Schematic of the population catchment area and methodology used to convert concentrations to consumption estimates.



SAMPLE COLLECTION AND PREPARATION

Daily composite samples were collected by treatment plant staff on 7 consecutive days, or where 7 days was not possible, across as many consecutive days as possible. Weekend samples in many of the Tasmanian sites were not available. Samples were stored at 4°C or were frozen prior to transport to South Australia or Queensland. Further details of the sampling protocol and relevant quality controls are included in Irvine et al. (2011), Lai et al. (2011), Lai et al. (2015), Tscharke et al. (2016) and Bade et al. (2019). All other descriptions of calculations, extractions and analytical methods are outlined in Report 1 (available at www.acic.gov.au). Methods to detect and analyse THC-COOH are outlined in Tscharke et al. (2016). Small revisions may be made to historical data when more accurate data become available, for example, when updated flow measurements supplied by wastewater utilities or population estimates become available.

PRESENTATION OF DATA AND INTERPRETATION OF GRAPHS

Reported averages: All consumption averages for state/territory or Australia-wide are presented throughout this report as population weighted averages. The number of people in the catchment population is used as the weighting for the respective drug consumption data for that population. For example, to calculate the population weighted average of capital city consumption, the consumption data for each WWTP was multiplied by the respective population, all data were then summed and divided by the total population across all capital city sites. Reported average values are therefore not skewed towards usage data from small, non-representative populations.

Per capita consumption: The per capita consumption estimates presented in this report are calculated using the total estimated catchment population (which includes children). Per capita alcohol consumption has previously been reported by the Australian Bureau of Statistics (ABS) based on population numbers for people aged 15 and over. The consumption values presented in this report will underestimate consumption determined for an adult-only population. For consistency, data from other studies were recalculated where necessary using the estimated total population.

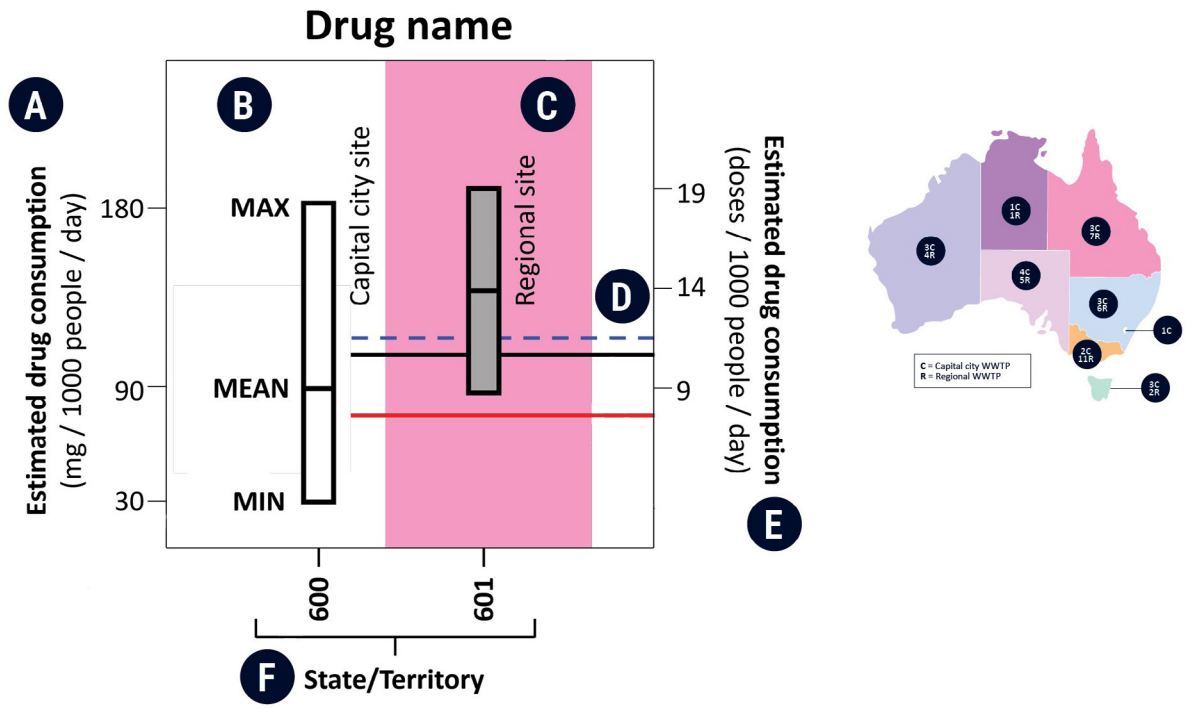
Graphical presentation of data: An overview of how the data is presented in the graphs for the individual sites is given in Figure 49. This includes information on interpreting the consumption data presented on the vertical axes in all graphs in this report. To improve readability of graphs with higher results in one site, we have reduced the graph height and labelled the higher value on the bar (values obtained from the left axis). In some graphs, the values plotted in the graph can be read as either mass of drug consumed (left axis) or doses of drug consumed (right axis). For the specific cases of MDA and ketamine, the amount of MDA and ketamine excreted following their consumption is not known, and therefore the drugs can only be expressed as how much drug was excreted into the sewer network, e.g. the mg excreted per 1,000 people per day. From Report 19, cannabis results were also presented as doses per day per 1,000 people, similar to other drugs. This has to be considered when referring to historical reports where results were shown only as mg consumed per day per 1,000 people. In addition, the calculation of cannabis used a different excretion rate prior to Report 19. From Report 19 all current and historical data have been revised and are comparable within the report.

Instrumental method limits of detection and limits of quantification: Since the wastewater samples contain very low quantities of particular drugs, the limit of detection (LOD) was determined analytically as the lowest concentration of that drug that could be determined in the sample (using the methods described in Report 1). A drug may be present at a concentration below the LOD. However, trace quantities may be present at undetectable levels. The limit of quantification (LOQ)[5] is a concentration (higher than the LOD), above which we have high confidence that the concentration measured on the analytical instrument is accurate. Above the LOD but below the LOQ there may be some uncertainty as to the actual concentration. To be conservative (a drug may be present but there is uncertainty as to its concentration) and in line with current practice, for back calculations to estimate per capita consumption, a concentration below the LOD was included as a value of LOD/√2. A concentration above the LOD but below LOQ, is included at the midpoint between the LOD and LOQ (i.e. (LOD + LOQ)/2). The frequency of detection is included in Appendix 3.

Weekly pattern of drug use: The pattern of drug consumption over the sampling week for the sites in this report cannot be elucidated from the data included. We present the maximum, minimum and average (for individual sites as illustrated in Figure 49 and only population-weighted average values for all other graphs. Consistent patterns of drug consumption in Australia from previous wastewater studies indicate that some substances such as cocaine, MDMA and alcohol have significantly higher consumption on weekends. Other drugs such as methylamphetamine, oxycodone and fentanyl tend to have smaller differences between days of the week (Lai et al. 2015, Tscharke et al. 2016).

5 LOQ is the lowest level that can be accurately measured.

Figure 49: Explanation of the graphs used for individual sites. General concepts relevant to all graphs in the report are also outlined (unique site codes, explanation of vertical axes, colour coding).



A

The **LEFT HAND AXIS** shows the estimated total mass consumed (in milligrams, mg) of a drug which is calculated by measuring the concentration of the drug's metabolite in a 24 hour wastewater composite sample, multiplying by the flow volume in the 24 hours, dividing by the population size and applying an excretion factor for the metabolite (see Equation 1, Report 1 for details).

To convert the mass consumed (left axis) to the estimated doses consumed (right axis), we divide the estimated mass consumed by the standard dose amount. Dose amount and excretion factors are given in Appendix 1 of Report 4. In this example, at Site 600, the minimum consumption was 30 mg in one day, the maximum was 180 mg and average was 90 mg per day over the sampling period (for every 1,000 people).

B

We collect wastewater data for up to 7 days and estimate the amount of drug consumed for each day of sampling. We plot the maximum **(MAX)** day's consumption, the minimum **(MIN)** day's consumption and the average **(MEAN)** across the 7 days. If the box is long, there is a large difference in consumption patterns over the week, for example, if the drugs are used excessively at weekends but not often during the week. Alternatively, a short box suggests a similar drug usage every day of the week. See also main text.

C

COLOURS help identify the State or Territory that the data related to (colours are consistent between figures).

D

These lines represent the **POPULATION WEIGHTED AVERAGES** for drug consumption for all capital city sites (blue dotted line), all regional sites (red line) and for all sites combined (black line). The method to calculate weighted population averages is given in the main text. In this example, the average consumption for regional Site 601 (horizontal bar with red checked box) is above both the average for regional sites and all sites nationally. In contrast, the average consumption for capital city Site 600 is below the national average.

E

The **RIGHT HAND AXIS** shows the estimated number of doses of a drug consumed by 1,000 people in the catchment in a 24 hour period: e.g., one dose would be 1 cigarette, 1 standard drink or 1 injected amount of drug. In this example, at Site 601, the minimum consumption was 9 doses in 1 day, the maximum was 19 and average was 14 per day over the sampling period (for every 1,000 people).

F

UNIQUE NUMBER allocated to each WWTP to maintain confidentiality. WWTP names will not be disclosed publicly.

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