

Research Paper

The epidemiology of amphetamine type stimulant-related admissions in Albany, Western Australia: Changes 10 years on

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Abstract

Objective: To identify longitudinal changes in the number and demographics of amphetamine type stimulant (ATS)-related admissions to a rural hospital, in comparison with findings from 2008–2013 and national trends.

Method: A retrospective quantitative epidemiological study of patients admitted to Albany Health Campus from 2018 to 2023 with an International Classification of Diseases-10 (ICD-10) code related to ATS. Age, gender, Indigenous status, and ATS-related ICD-10 code were compared over time, including repeat admissions. Substance used, ward, and comorbidities were observed.

Results: One hundred and seventy-nine admissions with an ATS-related primary diagnosis were identified, and a further 549 admissions with an ATS-related additional diagnosis. The mean age was 34.1, 55.9% were female, and 46.9% were Aboriginal. Repeat admissions accounted for 53.6% of total events. The most common ATS-related diagnosis code was F15.1 (harmful use) followed by F15.5 (psychotic disorder). Most admissions involved methamphetamine use and were to the mental health unit. Fifty-three percent had at least one comorbidity.

Conclusion: Both overall and repeat ATS-related admissions to Albany Health Campus have increased since the last decade. There is a growing proportion of female and older patients, and Aboriginal people are overrepresented. Many patients have comorbidities further complicating their hospitalisations.

Keywords: amphetamine, stimulant, regional, rural, epidemiology

Amphetamine type stimulants (ATS) are associated with significant harms including cardiovascular disease, accidental injury and drug toxicity, along with psychosis, suicide, polysubstance use, and financial, legal, housing, and relationship issues.^{1–4} In Australia, the national rate of ATS use in the last year was reported as 1.0% in 2022–2023 with a lifetime prevalence of 7.5%, down from 3.4% and 8.9%, respectively, in 2001.¹ The 20–29 and 40–49 age groups had the equal highest rates of use at 1.7% in 2022–23.⁵ Compared to 2001, these rates are down from 11.2% in the 20–29 age group and up from 1.0% in the 40–49 age group, indicating declining use of ATS amongst younger people while rates have increased amongst older people.¹

ATS have been the most common principal illicit drug of concern in alcohol and other drug treatment service episodes in Australia since overtaking cannabis in 2015–16.⁶ In 2022–23, 82% of treatment episodes for amphetamines

were for methamphetamine; 61% of clients were male; 20% of clients were Aboriginal and Torres Strait Islander people, and the most common age group was 30–39 (39%).⁶ ATS-related hospitalisations increased from 17 per 100,000 Australians in 2002–03 to a peak of 70 per 100,000 in 2019–20, then declined to 48 in 2021–22.⁷ In comparison, there were an estimated 296 alcohol-related hospitalisations per 100,000 Australians in 2021–22.⁷ ATS was the most common principal diagnosis for drug-related hospitalisations (22%), with 80% of these being methamphetamine-related.⁷ There were similar rates between metropolitan and regional/remote areas.⁷ The most common reason for ATS-related hospitalisation was

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drug-induced psychotic disorder (49%), followed by dependence (23%) and acute intoxication (14%).⁷

The increase in service utilisation and hospitalisations prior to the COVID-19 pandemic in 2020, despite decreasing rates of ATS use, may be related to a trend towards higher purity crystal use, with a decrease in average purity-adjusted price per gram.⁷⁻¹⁵ This has been reflected by an increase in helpline calls, arrests, hospital presentations, and methamphetamine-related deaths.^{4,16,17} ATS-related presentations pose a significant burden on healthcare services, ranging from managing aggression towards staff and patients, to substantial cost and resources.^{3,18,19}

Wastewater analysis revealed that methamphetamine consumption was similar in capital cities and regionally from August 2020 to April 2023 but was higher regionally than in capital cities in August and December 2023.²⁰ In December 2023, regional Western Australia had the highest average methamphetamine consumption nationally.²⁰ Lifetime ATS use is higher among rural Australians^{1,21}; however, there is a lack of longitudinal contemporary data regarding ATS use, service utilisation, and epidemiology in rural locations since the rise of crystal use in 2013.²²

Albany Health Campus is a 130-bed regional hospital, which includes a 16-bed Acute Psychiatric Unit, servicing the Great Southern region which encompasses 39,007 sq km and around 63,000 residents.^{23,24} The region has no hospital-based drug and alcohol service and no dedicated withdrawal or rehabilitation unit. Community drug and alcohol services are provided by a non-government organisation, which currently has a 5-year contract with the State Government.²⁵ Limited access to services in rural Australia results in increased costs and time associated with travel.²⁶ This study aims to emulate the design of a previous study and build on its data that was obtained from 2008-2013,¹¹ in order to identify how the number and demographics of ATS-related admissions have changed longitudinally in a specific rural setting in Australia and whether this reflects national trends. The results of this study could identify patients at risk, and inform the development of tailored strategies and specialised services in regions without or with limited drug and alcohol specific services to improve management and clinical outcomes.

Methods

This is a retrospective quantitative epidemiological study of patients who were admitted to Albany Health Campus from July 1st 2018 to December 31st 2023 with an ICD-10 code related to ATS (Table 1). Ethics approval was provided by the WA Country Health Service Human Research Ethics Committee (PRN RGS0000006416). Cases were identified by searching for admissions with ATS-related F codes F15.0-15.9. Identifying codes for each admission is completed by medical coders reviewing the clinical documentation for each patient. Data for admissions from January to June of 2018 was requested, but unavailable.

Table 1. International classification of diseases 10th revision (ICD-10)²⁷ classification of mental and behavioural disorders due to use of other stimulants, including caffeine.

Code	Description
F15.0	Acute intoxication
F15.1	Harmful use
F15.2	Dependence syndrome
F15.3	Withdrawal state
F15.4	Withdrawal state with delirium
F15.5	Psychotic disorder
F15.6	Amnesic syndrome
F15.7	Residual and late-onset psychotic disorder
F15.8	Other mental and behavioural disorders
F15.9	Unspecified mental and behavioural disorder

Patient age, gender, Indigenous/non-Indigenous status, ICD-10 code, substance used, length of stay, ward, and comorbidities were collated from the discharge summaries for identified admissions and compared over time. Repeat admissions were identified, and demographic data, ICD-10 code, substance used, and frequency of admission were recorded. All hospital admissions from a randomly selected week for each year from 2018 to 2023 were audited to verify the accuracy of the data set and identify missed cases.

Results

There were 179 hospital admissions with ICD-10 codes between F15.0 and 15.9 as the primary diagnosis. A further 549 hospital admissions with an ATS-related additional diagnosis were identified. The number of ATS-related admissions per year was higher in each year than any year from 2008-2013 (Figure 1).¹¹ Comparing per capita admission rates in census years reveals an increase from 49 per 100,000 Great Southern residents in 2011, to 165 per 100,000 Great Southern residents in 2021.²⁸ However, since 2018, there was a declining trend in the percentage of hospital admissions that were ATS-related (Figure 2).

The most frequent ATS-related diagnosis code was F15.1 (harmful use) at 47% followed by F15.5 (psychotic disorder) at 24%, which was largely unchanged from 10 years prior (Figure 3).¹¹ Psychotic disorder was the most common primary diagnosis (59%) and harmful use was the most common additional diagnosis (57%).

The mean age of patients admitted with an ATS-related primary diagnosis was 34.1, with a range between 18 and 60. Of these, 55.9% of were female, and Aboriginal people accounted for 46.9% of admissions. Eight percent of patients were aged 18-21 years; 15% were 22-25 years; 15% were 26-30 years; 18% were 31-35 years; 21% were

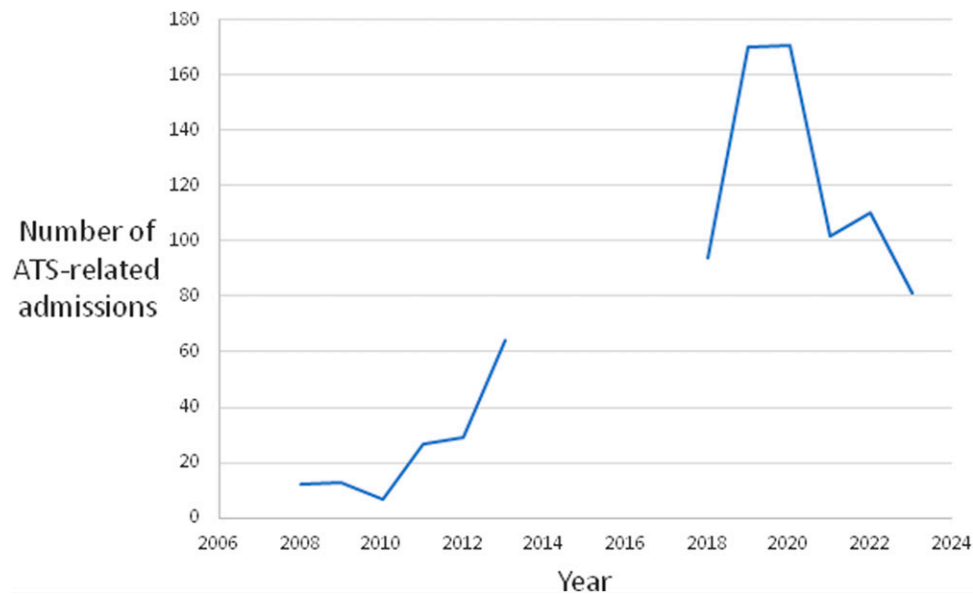


Figure 1. Number of amphetamine type stimulant (ATS)-related admissions per year. Note: Data for 2018 only includes 1/7/2018 to 31/12/2018.

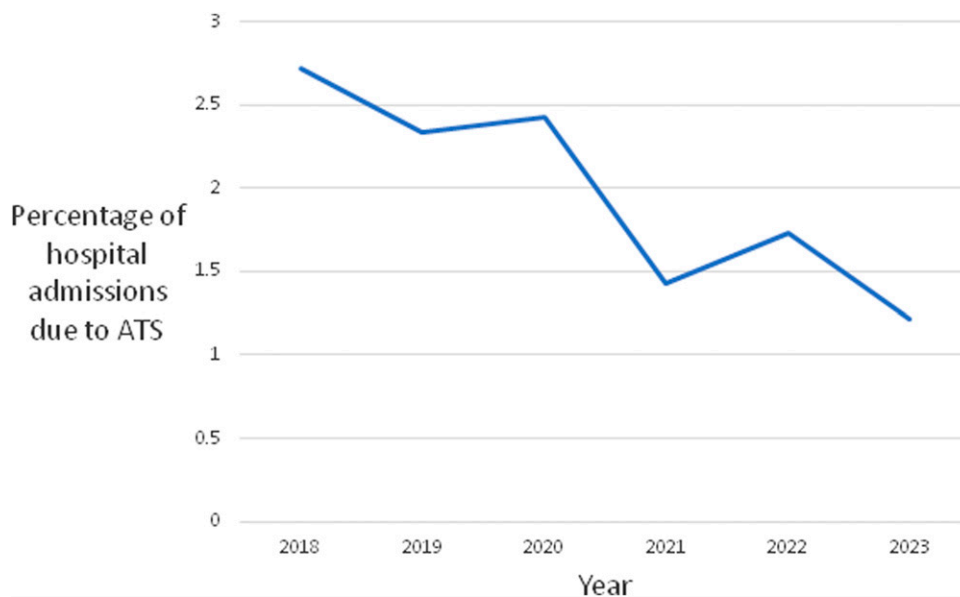


Figure 2. Percentage of hospital admissions per year due to amphetamine type stimulants (ATS).

36–40 years; and 24% were aged 41 years or older; with females comprising the majority of the two youngest age groups (Figure 4). In contrast, data from 2008–2013 found that 45% were female and 55% were male; the overall mean age was 27.9 years and the age range was 16 to 50 years, with 26–30 years the only age group that exceeded 20% of the total ATS-related admissions.¹¹

The substance used was methamphetamine in 96% of admissions with an ATS-related primary diagnosis, apart from three admissions involving an unspecified stimulant, three

admissions with amphetamine, and one admission with dexamphetamine. The mean length of stay was 7.8 days and almost all of these admissions were to the mental health unit.

Fifty-three percent of admissions with an ATS-related primary diagnosis had at least one comorbid ICD-10 code. As was the case from 2008–2013, the most frequent comorbidity was alcohol or substance use¹¹; 30.7% were coded for comorbid alcohol or substance use, 19.6% had a comorbid mental health ICD-10 code, 19.6% had a medical comorbidity, and 1.1% had a surgical comorbidity (Figure 5).

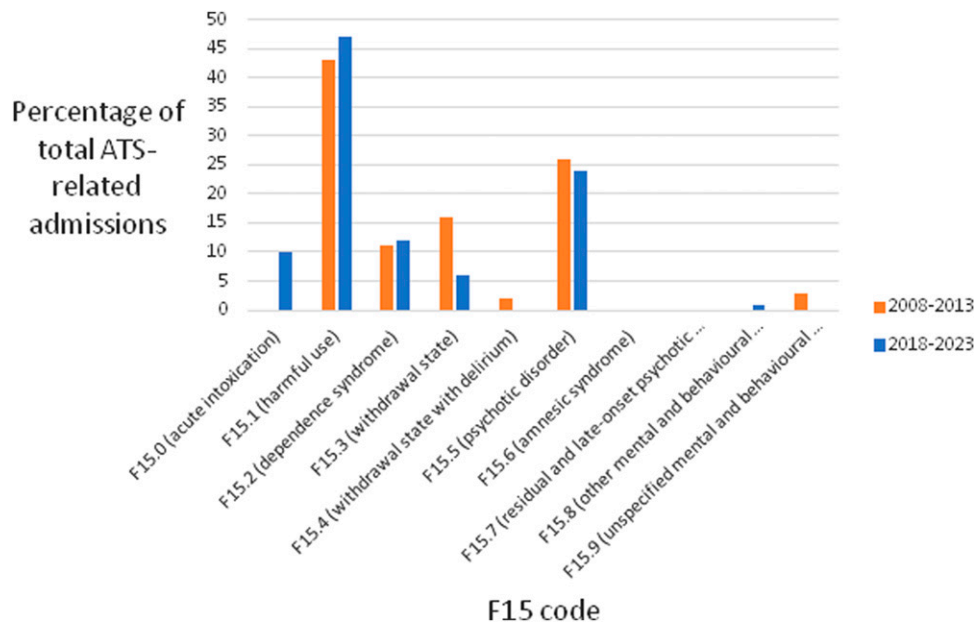


Figure 3. Frequency of F15 codes for amphetamine type stimulant (ATS)-related admissions.

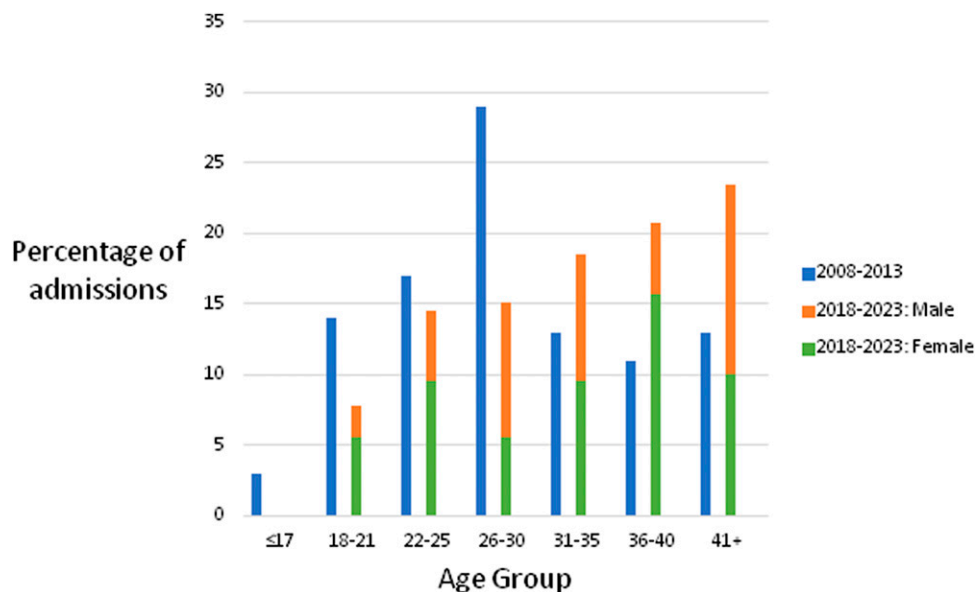


Figure 4. Percentage of ATS-related admissions by age group.

Twelve men and 20 women had more than one admission with an ATS-related primary diagnosis, accounting for 53.6% of total events, up from 35% of total events in 2008–2013.¹¹ Compared to the repeat admission group from 2008–2013, the percentage of females increased from 52.6% to 62.5%, the mean age increased from 29.3 years to 33.3 years, and the mean number of admissions per person increased from 2.8 to 3.0.¹¹ Seven of the men and 10 of the women were Aboriginal. The mean time between admissions of 203.6 days and the range of 2 to 1177 days both exceeded their corresponding findings from 2008–2013, which were 23.4 days and 7 to 45 days,

respectively.¹¹ Of these repeat admissions, 56% were coded as F15.5 (psychotic disorder), 17% as F15.0 (intoxication), 16% as F15.1 (harmful use), 9% as F15.2 (dependence), and 1% as F15.3 (withdrawal) and F15.8 (other). The substance used was methamphetamine in all cases.

The audit found one admission with a missing ATS-related additional diagnosis code for harmful methamphetamine use. Eight admissions were found to be incorrectly coded with an ATS-related primary diagnosis and were excluded from analysis.

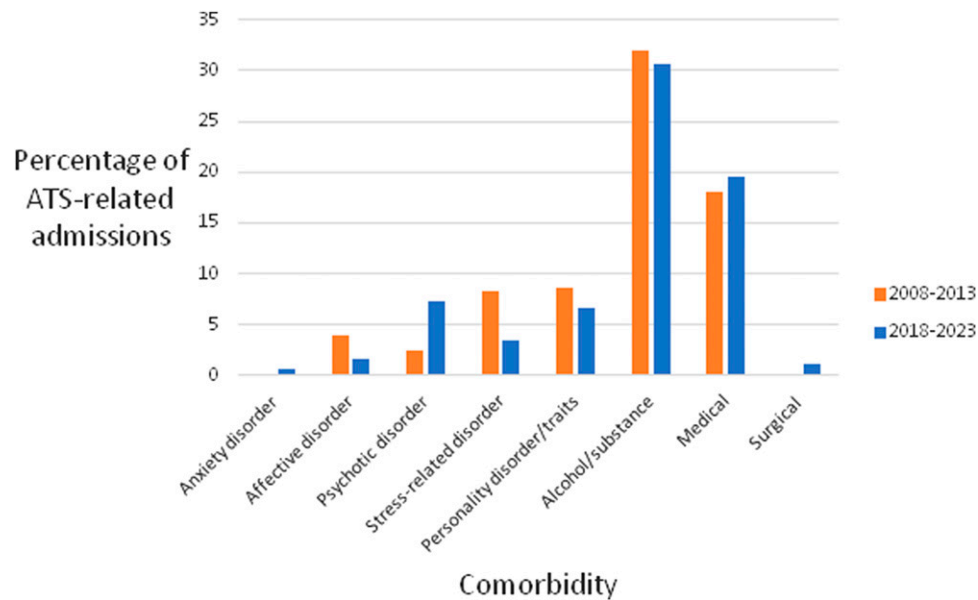


Figure 5. Frequency of comorbidities in ATS-related admissions.

Discussion

The number and proportion of ATS-related admissions to Albany Health Campus reflects national data showing a significant increase in service utilisation and hospitalisations since the preferred form of ATS shifted towards the higher purity crystal around 2013.⁸⁻¹⁷

The sharp decline in ATS-related admissions in 2021 could be explained by multiple lockdowns and restrictions on interregional and interstate travel that were part of the state government's COVID-19 pandemic response.²⁹ Along with disrupting the availability of methamphetamine, this would have likely contributed to the increase in market prices and thus decreased the quantity users could afford.³⁰ This declining trend regionally also correlates with national data that indicated a decrease in ATS-related hospitalisations along with reduced methamphetamine consumption after the onset of the pandemic.^{7,20} However, there has not yet been a rebound in the number of ATS-related admissions regionally as of 2023, as might have been expected based on December 2023 wastewater analysis showing that methamphetamine use returned to pre-pandemic levels and regional Western Australia had the highest average methamphetamine consumption nationally.²⁰

The most frequent reasons for admission from 2018–2023 were largely unchanged since 2008–2013.¹¹ Psychotic disorder was the most common primary diagnosis and harmful use was the most common additional diagnosis. A similar proportion of admissions had comorbid substance, mental health, or medical codes compared to 2008–2013, indicating that there remains a complex burden of disease on ATS users which further complicates their healthcare needs.¹¹

The increase in mean age and the top end of the age range of those admitted suggests rates of ATS use increasing amongst older people, also in line with national trends.¹ This could be due to a lack of uptake by younger people and the ageing of long-term ATS users; however, due to the data being deidentified, it is not possible to confirm that it is the same cohort.

The higher proportion of females being admitted is a change from the previous study and national data for 2021–22.^{7,11} Notably, females comprised the majority of admissions in the age groups 25 and under. Possible reasons for this could be higher rates of ATS use, greater willingness to attend hospital for treatment, or fewer limitations on access to health services compared to males. Aboriginal people were significantly overrepresented in this study, accounting for 46.9% of admissions with an ATS-related primary diagnosis, although Aboriginal people accounted for only 5% of the region's population in 2020, and 20% of national treatment episodes in 2022–23.^{6,23} This supports previous research in rural Australia which highlighted a disproportionately high rate of ATS-related admissions in Aboriginal people.¹² These differences in epidemiology are worthwhile considerations in developing targeted approaches to reduce ATS-related harms in the community.

There was a 53% increase in the percentage of repeat admissions from 2008–2013 to 2018–2023,¹¹ which indicates that there is a growing unmet need for community management of chronic methamphetamine use. The rise in repeat admissions could be explained by the increase in mean age, which may also be associated with increased comorbidities requiring hospitalisation. The substance used was methamphetamine in all cases and the majority were coded as psychotic disorder, which suggests that unaddressed methamphetamine use in the community is a significant driver for hospitalisations and contributing

to psychotic relapses. While the sample size was relatively small, it appeared that Aboriginal people were even more overrepresented amongst repeat admissions than single admissions. This may be due to inadequate follow up or barriers to accessing appropriate services, which could be explored in future research.

Conclusion

This study provides an insight into how ATS-related admissions have changed longitudinally at Albany Health Campus. The increase in ATS-related admissions since the last decade and the large proportion of repeat admissions show that operating with limited drug and alcohol services in a regional area leaves some patients, and the community, vulnerable to the ongoing effects of ATS use and reliant on acute health services, particularly inpatient mental health services, to try and meet these needs. The overrepresentation of Aboriginal people and increasing proportion of female and older patients indicate the importance of contemporary data to inform the development of tailored drug and alcohol services in the region, and the identification of patients at risk. There are undoubtedly many more ATS users who would also benefit from specialised services but were not captured by this study which was limited to hospitalisations. Further research is needed in the field, particularly in rural regions where methamphetamine use is outpacing capital cities but is not paralleled by access to drug and alcohol services.

Author contributions

Both authors contributed to the design, implementation and write-up of the project. Primary data collection was done by author Katerina Chua.

Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Ethical considerations

This study received ethical approval from the WA Country Health Service Human Research Ethics Committee (PRN RGS0000006416) on November 02, 2023.

Consent to participate

This included approval of a waiver for informed consent as this research involved negligible risk to participants.

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Data Availability Statement

The deidentified datasets generated and analysed during this study are available from the corresponding author on reasonable request.

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