

Drug related hospital stays in Australia 1993 - 2015

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Introduction

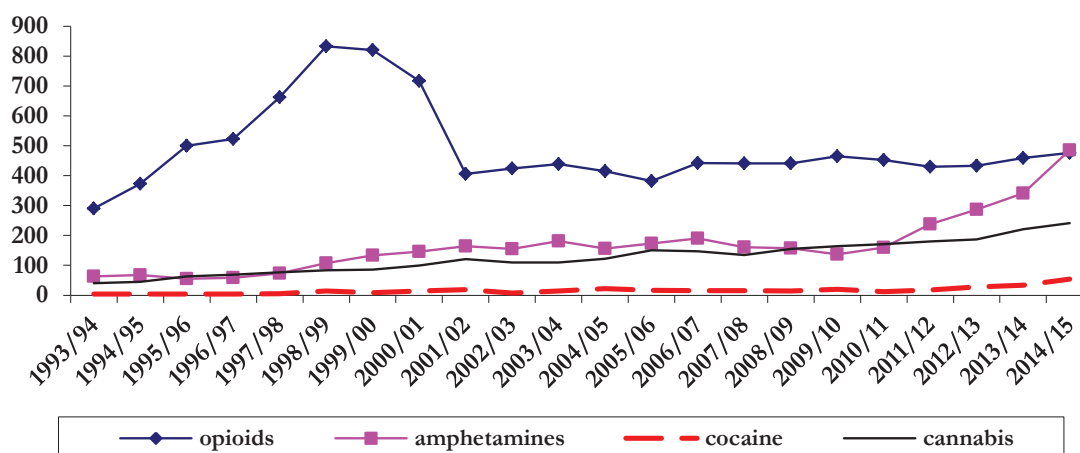
- + This bulletin presents data on drug-related hospital separations in Australia from 1993-2015 for the following drug types: opioids, cocaine, amphetamines and cannabis.
- + A hospital separation is defined as an episode of care for an admitted patient, which may refer to a total hospital stay (from admission to discharge), or a portion of a hospital stay beginning or ending in a change of type of care, or transfer to another hospital.
- + At the time of separation, a principal (i.e. main) diagnosis, and up to 40 secondary diagnoses may be made. The data presented in this bulletin includes only hospital separations where opioids, cocaine, amphetamines or cannabis were determined to be the principal reason for the hospital stay. The data presented will therefore be an under-estimate of the total number of drug-related hospital admissions.
- + Hospital separations are coded according to the World Health Organization's (WHO) International Statistical Classification of Diseases (ICD) and Related Problems. The ICD 10th revision (ICD 10 AM) (National Centre for Classification in Health, 1998) was used to code data dating from 1999 to the present in South Australia (SA), Western Australia (WA), and Queensland (QLD). The remaining jurisdictions commenced using ICD 10 AM codes in 1998. Prior to this, the ICD 9th revision (ICD 9 CM) (National Coding Centre, 1996) was used to code hospital separations.
- + Due to the different ways in which psychosis and withdrawal codes are treated in the ICD9 and ICD10 coding structure, we have undertaken separate analysis of amphetamine and cannabis related psychosis separations from 1999/00 onwards.
- + Analysis across drug types, reported from 1993 to 2015 does not include withdrawal or psychosis separations. We report amphetamine and cannabis-related separations from 1999 to 2015 separately.
- + Appendix A provides the ICD codes used in this bulletin.
- + As problems associated with drug use occur largely in youth to middle age, hospital separations are presented as numbers per million persons aged 15-54, calculated using the Australian Bureau of Statistics estimated resident population figures as at 30 June each year.
- + All figures referred to in this bulletin are rates per million population.
- + It should be noted that variations in coding practices may exist across jurisdictions.

Drug related hospital separations

Figure 1 shows the rates of hospital separations per million persons for each of the four drug types over the 22 year time period (1993-2015). Rates were highest for opioids across the entire period until 2014/15 when amphetamine admissions were highest. This marks the first time that rates of amphetamine hospital separations have surpassed those for opioids. Rates for cannabis separations were the third highest, followed by cocaine separations.

Drug related hospital stays in Australia 1993 - 2015

Figure 1: Rates per million persons of principal drug-related hospital separations in Australia among persons aged 15-54, by drug type, 1993-2015



Opioid-related hospital separations

For the purposes of this bulletin, opioid-related hospital separations are defined as those separations where opioids were recorded as the principal diagnosis. See Appendix A for the ICD codes used in this analysis.

TRENDS OVER TIME

- + There were 475 opioid-related separations per million persons recorded in 2014/15 (Figure 2).
- + In 2014/15, opioid dependence accounted for approximately half (52%) of all principal opioid-related separations in Australia. In 2000/01 separations for opioid dependence accounted for approximately two thirds (67%) of all opioid related separations.
- + Over time there has been an increase in separations due to poisoning from opioids other than heroin (including morphine, oxycodone, and codeine) which accounted for 21% of all opioid-related separations in 2014/15. These poisonings accounted for 7% of all opioid-related separations in 2000/01.
- + Separations due to heroin poisoning (N=561) comprised 9% of all opioid-related separations in 2014/15 among Australians aged 15 to 54, compared to 16% (N=1322) of separations in 2000/01.

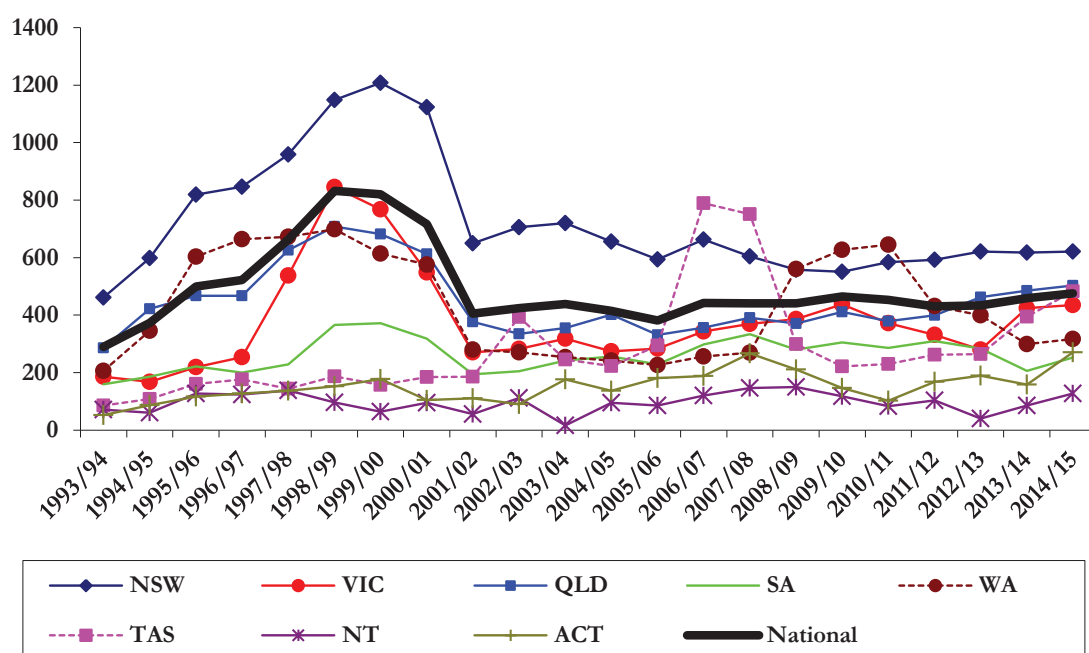
JURISDICTIONAL ANALYSIS

- + Opioid-related separations have been highest in New South Wales (NSW) over the 21 year period except for the period 2006/07-2010/11. In 2014/15 there were 620 separations per million persons recorded in NSW. Separations in NSW trended downwards between 2006/07 and 2009/10. They have remained relatively stable since this time (Figure 2).
- + Separations in Queensland (QLD) were the next highest and show a steady increase over the past five years. There were 503 separations per million persons recorded in 2014/15.
- + Victoria (VIC) has recorded increases in opioid related separations in the past two years (to 434 per million in 2014/15),
- + Separations in Tasmania (TAS) have increased since 2009/10 with 482 separations per million persons in 2014/15.
- + Western Australia (WA) also recorded relatively high rates of opioid-related separations between 2008/09 and 2010/11, with separations declining over the past three years. There were 316 separations per million persons recorded in 2014/15.

Drug related hospital stays in Australia 1993 - 2015

- + Rates have fluctuated in South Australia (SA) (253 per million persons in 2014/15), the Northern Territory (NT) and the Australian Capital Territory (ACT) (Figure 2).

Figure 2: Rates per million persons of principal opioid-related hospital separations in Australia among persons aged 15-54, 1993-2015



AGE ANALYSIS

- + In 2014/15, the 30 to 39 year age group accounted for the largest proportion (34%) of opioid-related separations, followed by the 40 to 49 year age group (27%) (Figure 3).
- + Over time, there were different trends apparent across different age groups. Separations among Australians aged 30 to 39, 40 to 49 and 50 to 59 years have increased since 2001/02. Figures recorded among the 40 to 49 and 50 to 59 year olds are higher than those recorded in 2000/01.
- + Separations among the 20 to 29 year age group have been declining since 2009/10.
- + Opioid-related separations have remained relatively stable among Australians aged 10 to 19 years and were lowest among this age group in 2014/15 (Figure 3).

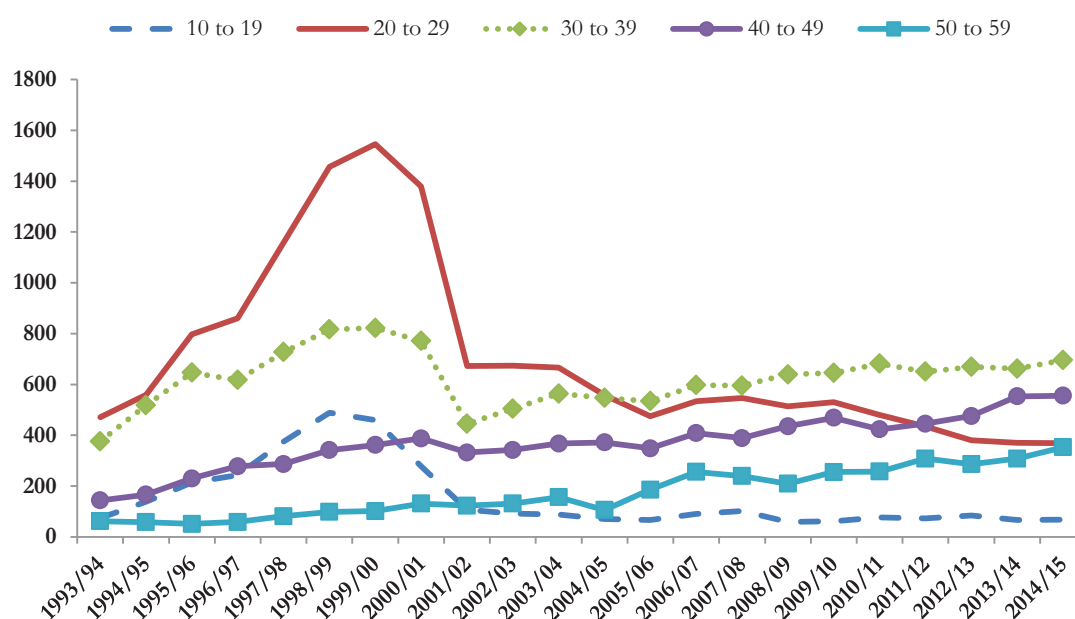
TRENDS IN OTHER DATA

- + At the national level, trends among a sentinel group of people who inject drugs (PWID) surveyed for the Illicit Drug Reporting System – IDRS, show that while the prevalence of heroin use has remained stable, the frequency of use among regular PWID has increased over time. This trend stabilised in 2016 (Stafford and Breen 2017).
- + This group also reports injecting pharmaceutical opioids such as morphine and oxycodone, however prevalence of use of these opioids has declined over the past four years (Stafford and Breen, 2017).

Drug related hospital stays in Australia 1993 - 2015

- + What is likely to be influencing trends in opioid-related separations is the increased utilisation of opioids in Australia, with an almost four-fold increase recorded between 1990 and 2014 (Karanges et al, 2016).

Figure 3: Rates per million persons of principal opioid-related hospital separations in Australia by ten year age group, 1993-2015



Amphetamine-related hospital separations

For the purposes of this bulletin, amphetamine-related hospital separations are defined as those separations where amphetamines (including methamphetamine) were recorded as the principal diagnosis. See Appendix A for the ICD codes used in this analysis. Amphetamine-related hospital separations also include separations for ecstasy.

TRENDS OVER TIME

- + The 2014/15 amphetamine-related separations represented the highest number recorded since 1993/94 at 6,313 separations (Figure 4).
- + Separations steadily increased during the mid 90's, and peaked at 180 per million persons in 2003/04 and again at 190 in 2006/07. Since 2009/10, separations have more than tripled from 136 separations per million persons to 485 per million persons in 2014/15. This represents the first time that rates of amphetamine-related separations have surpassed those for opioids (475 per million persons in 2014/15) (Figure 1).
- + Over time, separations for amphetamine dependence have accounted for an increasing proportion of amphetamine-related separations in Australia, from 30% in 1999/00 to 50% in 2014/15.
- + In 2014/15 amphetamine psychosis separations were high at 4,121 (316 per million persons), representing under half (40%) of the total separations for amphetamine (psychosis - 4,121, amphetamine-related (use and poisoning) -6,313) combined.

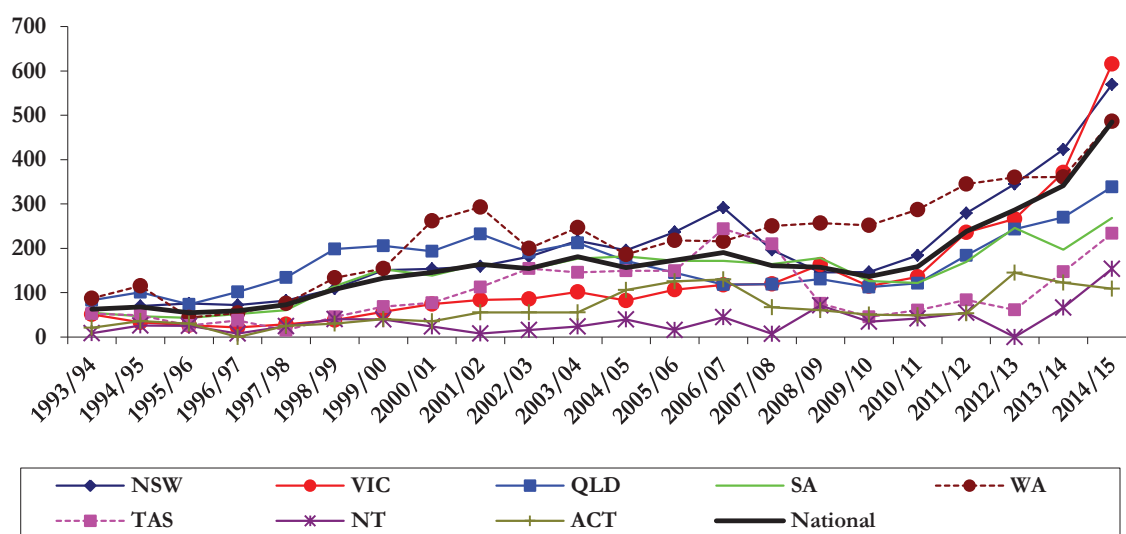
Drug related hospital stays in Australia 1993 - 2015

- + Separations for amphetamine psychosis steadily increased to 2005/06 and have increased again since 2009/10 across all jurisdictions except the ACT (Figure 5).

JURISDICTIONAL ANALYSIS

- + Over the past three years amphetamine-related separations were at the highest level to date in VIC, NSW, and WA (at 615, 569, and 486 per million persons respectively – Figure 4). All three jurisdictions recorded steady increases over the last four years.
- + QLD, SA and TAS have also recorded increases at lower levels (338, 268 and 233 per million persons in 2014/15).
- + The NT and ACT recorded the lowest rates of amphetamine-related separations relative to the other jurisdictions (at 154 and 109 separations per million persons respectively – Figure 4). Rates are based on relatively small numbers.

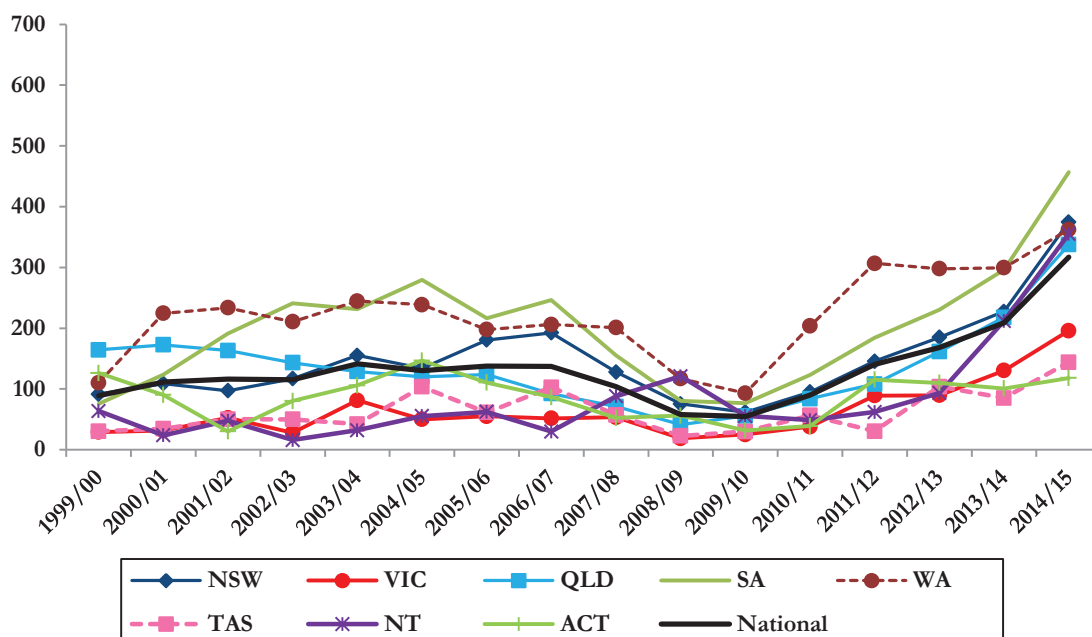
Figure 4: Rates per million persons of principal amphetamine-related hospital separations in Australia among persons aged 15-54, 1993-2015



NB: These figures do not include amphetamine-psychosis separations. These are reported separately in Figure 5.

Drug related hospital stays in Australia 1993 - 2015

Figure 5: Rates per million persons of amphetamine-psychosis hospital separations in Australia among persons aged 15-54, 1999-2015



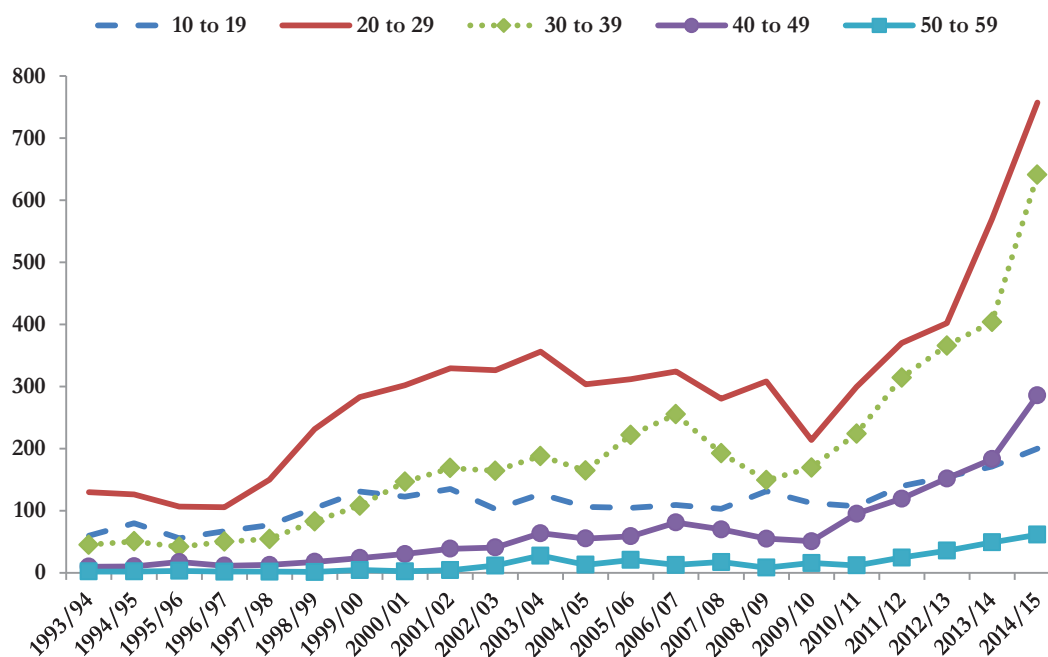
NB: Amphetamine-psychosis separations in WA may be overestimated for 2010 to 2013 due to a new facility joining the collection in 2010, and different coding practices employed. However, other amphetamine separations reported in Figure 3 show an increasing trend in WA.

AGE ANALYSIS

- + Over time, amphetamine-related separations have been highest among the 20 to 29 year age group, followed by the 30 to 39 year age group (Figure 6).
- + Rates of amphetamine-related separations among the 20 to 29 and 30 to 39 year age have increased markedly since 2009/10.
- + Separations among the 40 to 49 year olds have increased (albeit at lower levels) since 2009/10.
- + Separations among the 10 to 19 year olds have also increased at a lower rate.
- + Separations among the 50 to 59 year olds have remained comparatively low (Figure 6).

Drug related hospital stays in Australia 1993 - 2015

Figure 6: Rates per million persons of principal amphetamine-related hospital separations in Australia by ten year age group, 1993-2015



TRENDS IN OTHER DATA

- + Law enforcement data are consistent with the noted increase in amphetamine-related hospital separations. The Australian Government Department of Immigration and Border Protection detected a record number (3,479) of amphetamine-type-stimulant seizures, in 2014/15, at a record total weight of 3,422 kg (Australian Customs and Border Protection Service, 2016).
- + The number of clandestine laboratories detected in Australia has stabilised at 667 in 2014/15 after increases were seen from 2008/09. The majority were manufacturing amphetamine type stimulants (excluding MDMA) (Australian Criminal Intelligence Commission, 2016).
- + Trends among a sentinel group of people who inject drugs (PWID), surveyed for the Illicit Drug Reporting System – IDRS, show a continued increase in the prevalence of crystal methamphetamine use since 2010 (Stafford and Breen 2017), and an increase in the proportions injecting crystal methamphetamine weekly or more often (Degenhardt et al, 2016a).
- + Data from the 2013 National Drug Strategy Household Survey (NDSHS) showed that although the prevalence of past year methamphetamine use remained stable at 2.1% in the general population, there was a change in the main form used from powder to crystalline (51% in 2010 reported mostly using powder methamphetamine compared to 29% in 2013, and 22% in 2010 reported mostly using crystal methamphetamine compared to 50% in 2013). There has also been a significant increase in the proportion of methamphetamine users reporting weekly or more often methamphetamine use (from 9.3% in 2010 to 15.5% in 2013) (<http://www.aihw.gov.au/alcohol-and-other-drugs/ndshs/2013/illicit-drug-use/#illicit>).
- + Recent research on the estimates of numbers of dependent methamphetamine users in Australia has shown that 1) the rates of dependent methamphetamine use has increased since 2009/10; 2) rates were highest among Australians aged 25 to 34 years; and 3) rates of dependent methamphetamine use had increased in Australians aged 15 to 24 year (Degenhardt et al, 2016).

Drug related hospital stays in Australia 1993 - 2015



Cannabis-related hospital separations

For the purposes of this bulletin, cannabis-related hospital separations are defined as those separations where cannabis was recorded as the principal diagnosis. See Appendix A for the ICD codes used in this analysis.

TRENDS OVER TIME

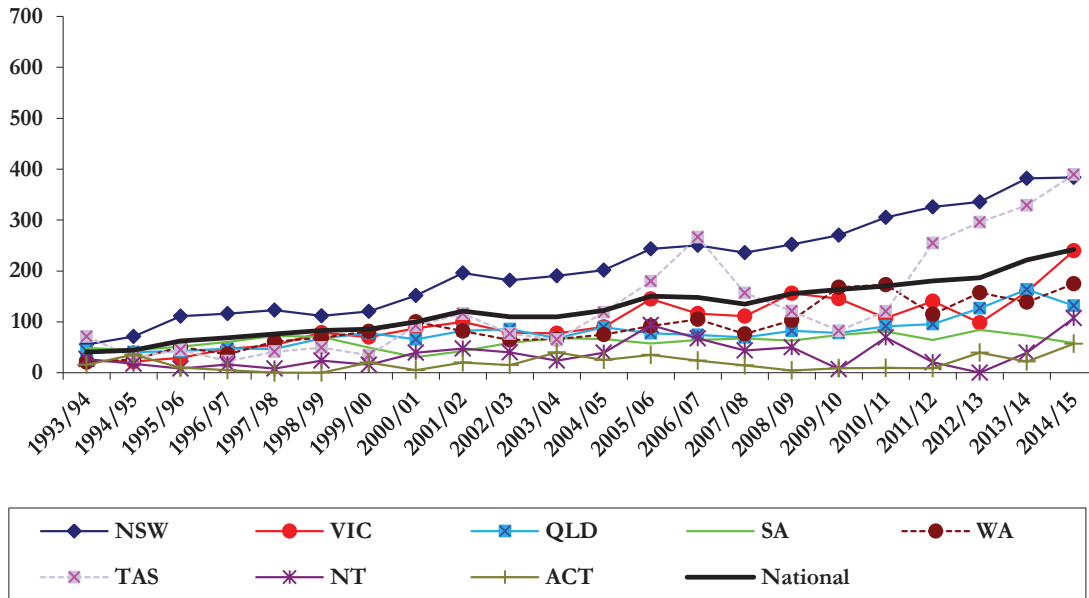
- + Cannabis-related separations have steadily increased since 1993/94, with figures recorded in 2014/15 representing the highest over the entire period at 3,145 - 241 separations per million persons (Figure 7).
- + Separations for cannabis dependence accounted for an increasing proportion of all cannabis-related separations in Australia, from 55% in 1999/00 to 71% in 2014/15.
- + Separations for cannabis psychosis represented one-third (33%) of the total separations for cannabis at 121 per million persons (i.e. 1,579 separations for psychosis and 3,145 for cannabis use and poisoning combined (Figure 8)). Rates for cannabis psychosis are lower than those for amphetamine psychosis (Figure 5).

JURISDICTIONAL ANALYSIS

- + Cannabis-related separations have been consistently highest in NSW although in 2014/15, TAS rates of cannabis-related separations surpassed those in NSW at 389 per million persons. The increase in TAS in 2014/15 was driven by separations for cannabis dependence (accounting for 74% of the separations).
- + Steady increases have been recorded in NSW since 1993/94 (from 55 per million persons in 1993/94 to 383 separations per million persons in 2014/15) (Figure 7). This increase has largely been driven by cannabis dependence, comprising 92% of cannabis-related separations in NSW in 2013/14.
- + QLD has also recorded steady increases in cannabis-related separations to 2013/14, with a slight drop to 131 per million persons in 2014/15. Trends have fluctuated in the remaining jurisdictions (Figure 7).
- + NT has consistently recorded the highest rates of cannabis psychosis separations. Figures have fluctuated since 2011/12. The numbers of separations however are small and this data should be interpreted with caution (Figure 8).
- + Cannabis psychosis separations have increased across all jurisdictions except the ACT and VIC over the past 3 years (Figure 8). Separations in VIC have remained relatively stable during this period, while the ACT recorded a decline in 2014/15 (Figure 8).

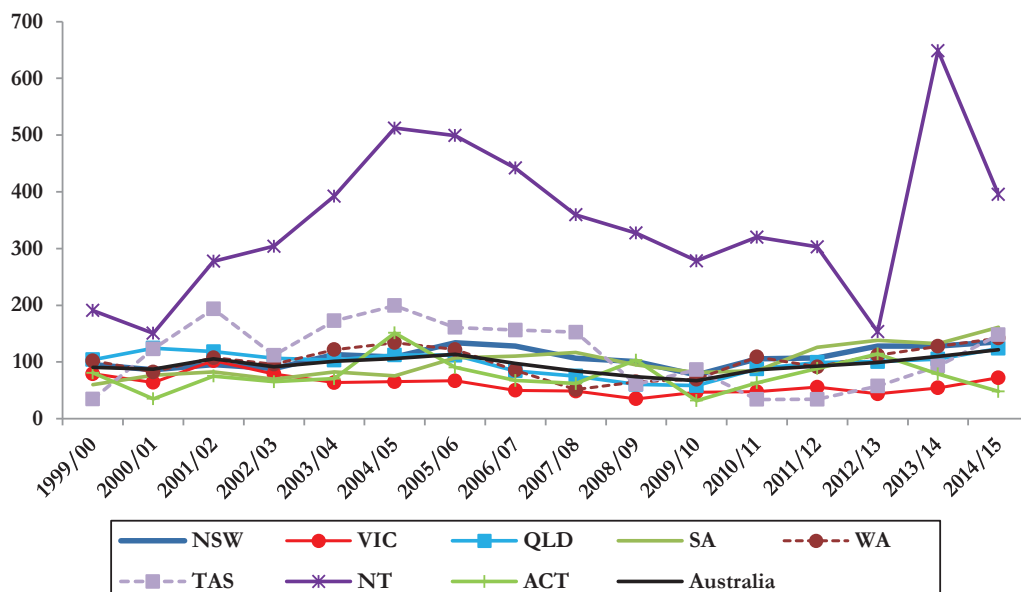
Drug related hospital stays in Australia 1993 - 2015

Figure 7: Rates per million persons of principal cannabis-related hospital separations in Australia among persons aged 15-54, 1993-2015



NB: These figures do not include cannabis-psychosis separations. These are reported separately in Figure 8.

Figure 8: Rates per million persons of principal cannabis-psychosis hospital separations in Australia among persons aged 15-54, 1999-2015



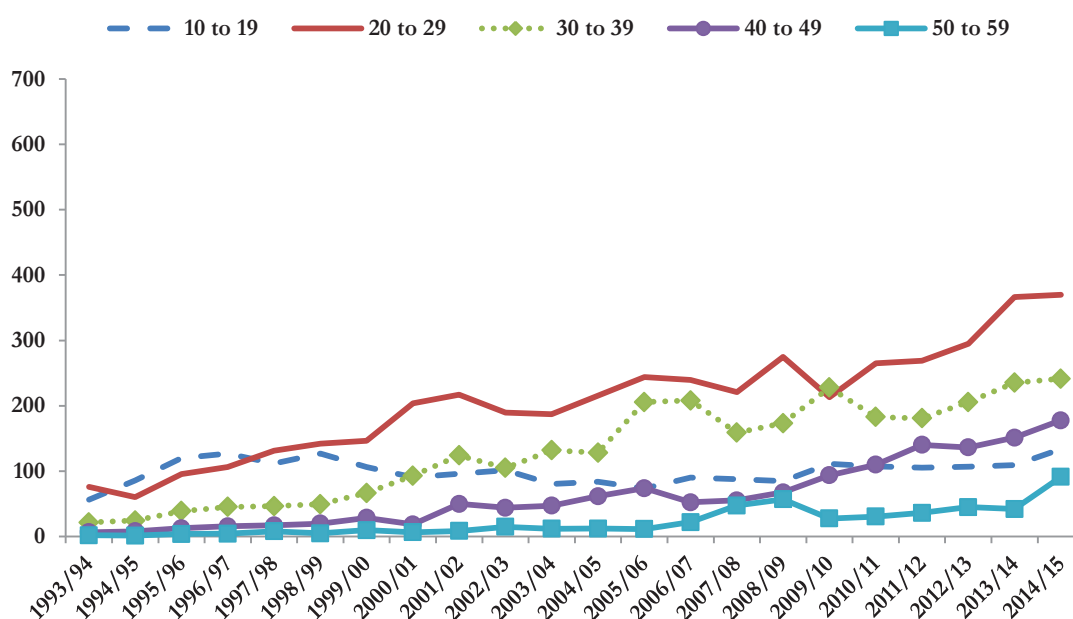
NB: High rates of cannabis-psychosis in the NT are based on low numbers and should be interpreted with caution.

Drug related hospital stays in Australia 1993 - 2015

AGE ANALYSIS

- + In 2014/15, the 20 to 29 year age group accounted for the largest proportion (38%) of all cannabis-related separations, and these were primarily (73%) for dependence. Rates among this age group have almost doubled since 2009/10 (Figure 9).
- + Steady increases in cannabis-related separations have also been recorded among the 30 to 39 and 40 to 49 year age groups since 2009/10.
- + Cannabis-related separations among the 10 to 19, and 50 to 59 year olds remain lower, and have remained stable to 2013/14, with increases recorded in 2014/15 (Figure 9).

Figure 9: Rates per million persons of principal cannabis-related hospital separations in Australia by ten year age group, 1993-2015



TRENDS IN OTHER DATA

- + The 2013 National Drug Strategy Household Survey reported a stable trend in past year prevalence of cannabis use among Australians at 10.2% (Australian Institute of Health and Welfare, 2014).
- + Trends among a sentinel group of people who regularly use stimulants (the Ecstasy and related Drugs Reporting System - EDRS) show that just under one-quarter (21%) of this group reports using cannabis daily (Stafford and Breen 2017a), which is known to be associated with problems, including dependence.
- + Approximately one-third of those surveyed for the Illicit Drugs Reporting System in 2016 reported daily cannabis use in 2016 (Stafford and Breen 2017).

Drug related hospital stays in Australia 1993 - 2015



Cocaine-related hospital separations

For the purposes of this bulletin, cocaine-related hospital separations are defined as those separations where cocaine was recorded as the principal diagnosis. See Appendix A for the ICD codes used in this analysis.

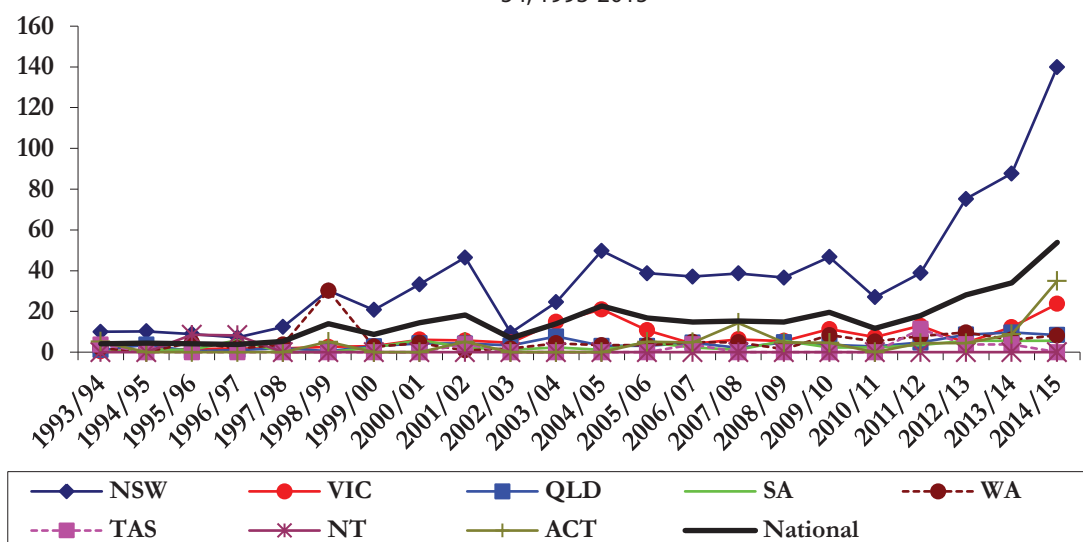
TRENDS OVER TIME

- + Cocaine-related separations were the lowest across the four drug types during the entire period (Figure 1). Separations have steadily increased since 2010/11. Separations were the highest on record in 2014/15 at 700 (53 separations per million persons), and were predominantly (75%) for cocaine dependence.

JURISDICTIONAL ANALYSIS

- + NSW accounted for the majority (n=575, 82%) of all cocaine-related separations recorded in Australia in 2014/15 (Figure 10).
- + NSW recorded the highest number of cocaine-related separations (139 per million persons in 2014/15) during the entire period, and these separations have increased markedly since 2010/11.
- + The increase in NSW has been driven primarily by cocaine dependence. In 2014/15, the majority (81%) of NSW cocaine-related separations were for dependence.
- + The remaining jurisdictions recorded much lower numbers of cocaine-related separations throughout the time period (Figure 10).

Figure 10: Rates per million persons of principal cocaine-related hospital separations in Australia among persons aged 15-54, 1993-2015

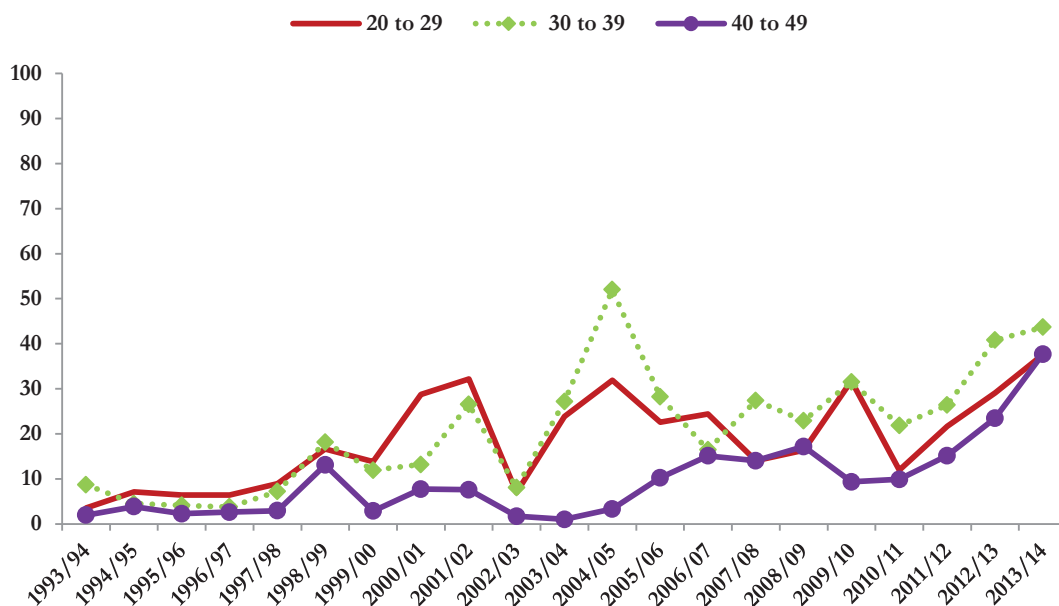


AGE ANALYSIS

- + The 30 to 39 year age group continued to account for the largest proportion of cocaine-related separations (42% in 2014/15) followed by the 20 to 29 year olds (30%) (Figure 11).
- + There have been increases in the rates of separations among Australians aged 20 to 49 years over the past four years (Figure 11).

Drug related hospital stays in Australia 1993 - 2015

Figure 11: Rates per million persons of principal cocaine-related hospital separations in Australia by ten year age group, 1993-2015



NB: Data for the 10 to 19 and 50 to 59 year age groups is not shown as numbers are small

TRENDS IN OTHER DATA

- + The trends seen in cocaine-related hospital separations in NSW are consistent with trends in cocaine use among people surveyed for both the IDRS and EDRS (Stafford and Breen, 2017; Stafford and Breen 2017a), with use being most prevalent in NSW.
- + Although the weight of cocaine seizures has declined, there have been an increasing number of seizures detected at the border since 2010 (Australian Government Department of Immigration and Border Protection 2016).
- + Trends in cocaine-related separations should be interpreted with caution due to relatively small numbers in many jurisdictions.

Drug related hospital stays in Australia 1993 - 2015

Summary and implications

- + Opioid-related separations have stabilised at a higher level, although increases are particularly apparent among 40 to 49 year old Australians. Presentations continue to be for both acute (poisoning) and chronic (dependence) conditions related to opioid use.
- + Heroin poisoning presentations remain stable and there is an upward trend in poisoning due to other opioids.
- + Continued vigilance with respect to prescribing of pharmaceutical opioids, as well as monitoring for signs of misuse and dependence is important, particularly among Australians who may be likely to have comorbid medical conditions that increase the risk of overdose.
- + Amphetamine-related separations reached unprecedented numbers in 2014/15, and for the first time, surpassed rates of opioid-related separations.
- + Dependence continues to account for a substantial proportion of amphetamine-related separations, and amphetamine psychosis separations increased substantially between 2013/14 and 2014/15.
- + Amphetamine-related separations are most prevalent among younger Australians aged 20 to 39 years, although separations have more than doubled over the past three years among Australians aged 40 to 49 years.
- + Recent research shows increases in dependent methamphetamine use have been most marked among young Australians aged 25 to 34 years (Degenhardt et al, 2016), indicative that harm reduction messages targeting this group are warranted.
- + Currently there are no effective pharmacological treatments for methamphetamine dependence in Australia (Brensilver et al, 2013). Engaging people early in evidence based psychological treatment for methamphetamine related problems is critical, as well as increased access to treatment (Degenhardt et al, 2016a). Education about the mental health problems, including psychosis, associated with methamphetamine use is also important.
- + Cannabis-related separations have continued to increase over time in Australia and they are predominantly for cannabis dependence.
- + Cannabis-related separations are most prevalent among young Australians aged 20 to 29 years, indicative that some users are developing problems with their cannabis use at a young age.
- + Early intervention and engagement of cannabis users in treatment, as well as education about the mental health problems, including psychosis, associated with cannabis use is important.
- + Cocaine-related separations in NSW continue to account for the majority of separations nationally and have continued to increase over the past 4 years. In 2014/15 cocaine-related separations were predominantly for dependence, and separations overall were most prevalent among Australians aged 30 to 39.

Acknowledgements

Information contained in this bulletin comes from the National Hospital Morbidity Database. This database is fundamental to the monitoring capacity of the National Illicit Drug Indicators Project. These data provide invaluable information about trends in drug-related harms in Australia, as well as the context within which these trends can be understood. Each additional year of data adds further value to the project and, in conjunction with other available data sources, provides a reliable framework within which to inform evidence-based drug policy in Australia.

We would like to acknowledge the Australian Institute of Health and Welfare, and all of the State and Territory Health Departments, for providing us with access to the National Hospital Morbidity Database.

Drug related hospital stays in Australia 1993 - 2015

Appendix A

OPIOID-RELATED HOSPITAL SEPARATIONS

The following ICD-9-CM (from 1993/94 to 1998/99) and ICD-10-AM (from 1999/00 to 2014/15) codes were used to examine trends in opioid-related hospital separations:

ICD-9 diagnosis	ICD-10 diagnosis	ICD-9-CM	ICD-10-AM
Opium poisoning	Opium poisoning	96500	T400
Heroin poisoning	Heroin poisoning	96501	T401
Methadone poisoning	Methadone poisoning	96502	T403
Morphine/codeine/pethidine poisoning	Other opioids poisoning (including morphine, codeine, oxycodone)	96509	T402
Morphine/codeine/pethidine poisoning	Other synthetic narcotics poisoning (including pethidine)	96509	T404
Morphine/codeine/pethidine poisoning	Other and unspecified narcotics poisoning	96509	T406
Opioid type dependence (including heroin, methadone, morphine, opium)	Opioid dependence syndrome	3040	F112
Opioid and other drug dependence	No equivalent	3047	N/A
Opioid use disorder	Opioid acute intoxication	3055	F110
Opioid use disorder	Opioid harmful use	3055	F111

Note: Withdrawal codes for ICD-9-CM were not drug specific, and accordingly, for comparability purposes, these separations have been left out of the analysis. The Eighth Edition ICD10AM was used to analyse data from 2013/14 onwards.

AMPHETAMINE-RELATED HOSPITAL SEPARATIONS

The following ICD-9-CM (from 1993/94 to 1998/99) and ICD-10-AM (from 1999/00 to 2014/15) codes were used to examine trends in amphetamine-related hospital separations:

ICD-9 diagnosis	ICD-10 diagnosis	ICD-9-CM	ICD-10-AM
Psychostimulant poisoning	Poisoning by psychostimulants (excluding cocaine)	9697	T436
Amphetamine and other psychostimulant dependence (methylphenidate, phenmetrazine)	Stimulant dependence syndrome	3044	F152
Amphetamine or related sympathomimetic use disorder	Stimulant acute intoxication	3057	F150
Amphetamine or related sympathomimetic use disorder	Stimulant harmful use	3057	F151
N/A	Stimulant psychotic disorder	N/A	F155

Note: Withdrawal and drug-induced psychosis codes for ICD-9-CM were not drug specific, and accordingly, for comparability purposes, these separations have been left out of the long-term trend analysis. Amphetamine psychosis separations are reported separately from 1999/00 to 2014/15. The Eighth Edition ICD10AM was used to analyse data from 2013/14 onwards.

Drug related hospital stays in Australia 1993 - 2015

Appendix A continued...

CANNABIS-RELATED HOSPITAL SEPARATIONS

The following ICD-9-CM (from 1993/94 to 1998/99) and ICD-10-AM (from 1999/00 to 2014/15) codes were used to examine trends in cannabis-related hospital separations:

ICD-9 diagnosis	ICD-10 diagnosis	ICD-9-CM	ICD-10-AM
Cannabis poisoning	Cannabis poisoning	9696	T407
Cannabis dependence	Cannabis dependence syndrome	3043	F122
Cannabis use disorder	Cannabinoids acute intoxication	3052	F120
Cannabis use disorder	Cannabinoids harmful use	3052	F121
N/A	Cannabis psychotic disorder	N/A	F125

Note: Withdrawal and drug-induced psychosis codes for ICD-9-CM were not drug specific, and accordingly, for comparability purposes, these separations have been left out of the analysis. Cannabis psychosis separations are reported separately from 1999/00 to 2014/15. The Eighth Edition ICD10AM was used to analyse data from 2013/14 onwards.

COCAINE-RELATED HOSPITAL SEPARATIONS

The following ICD-9-CM (from 1993/94 to 1998/99) and ICD-10-AM (from 1999/00 to 2007/08) codes were used to examine trends in cocaine-related hospital separations:

ICD-9 diagnosis	ICD-10 diagnosis	ICD-9-CM	ICD-10-AM
Cocaine dependence	Cocaine dependence syndrome	3042	F142
Cocaine use disorder	Cocaine acute intoxication	3056	F140
Cocaine use disorder	Cocaine harmful use	3056	F141

Note: The ICD-9-CM cocaine poisoning code includes procaine, tetracaine and lignocaine poisoning and accordingly, cannot be translated to an ICD-10-AM poisoning code. Withdrawal and drug-induced psychosis codes for ICD-9-CM were not drug specific, and accordingly, for comparability purposes, these separations have been left out of the analysis. The Eighth Edition ICD10AM was used to analyse data from 2013/14 onwards.

RELATED LINKS

For more information on NDARC research, go to: <http://ndarc.med.unsw.edu.au/>

For more information on Drug Trends research go to: <http://www.drugtrends.org.au/>

For more information about the AIHW, go to: <http://www.aihw.gov.au>

For more information on ICD-10, go to: <http://www.who.int/whosis/icd10/>

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Drug related hospital stays in Australia 1993 - 2015



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