Substance Abuse: Research and Treatment



ORIGINAL RESEARCH

# Drug, Sex and Age Differentials in the Use of Australian Publicly Funded Treatment Services

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**Abstract**

**Context:** Little is known about the proportion of the Australian population using alcohol or other drugs who may seek treatment. There is a need to have some additional estimates of population morbidity which reflect harms associated with use.

**Objective:** To determine Australian population rates of publicly funded community based specialised alcohol and other drug treatment and in-patient hospital care by those 'at risk', by drug type, sex and age.

**Design and setting:** The design is secondary data analysis of publicly available datasets. We use the latest available complete data on Australian general population incidence of alcohol, cannabis amphetamines and ecstasy use (2007 National Drug Strategy Household Survey) and nationally collected administrative data on publicly funded specialised alcohol and other drug treatment services (2006–2007 Alcohol and Other Drug Treatment Services National Minimum Dataset) and public hospitals (2006–2007 National Hospital Morbidity Minimum Dataset) to calculate rates of drug treatment and in-patient hospital care per 1000 Australians. 'At risk' for alcohol is defined as being at risk of short term harm, as defined by the National Health and Medical Research Council (2001). 'At risk' for illicit drugs is defined as those exposed to potential harm through at least weekly use of cannabis, amphetamines and ecstasy use.

**Results:** Risky alcohol consumption followed by recent cannabis use appears to lead to most harm. Greater harm seems to be experienced by males rather than females. Younger adults (15–19 years) and older adults (40+ years) seem also to experience the highest rates of harm.

**Conclusions:** It is possible to derive population estimates of harms associated with licit and illicit drugs use. Treatment rates vary across drug type, gender and age. Alcohol and cannabis are the substances whose use leads to the greatest demand for services. Ecstasy appears to generate few presentations for treatment. Publicly available data can be used to estimate harms associated with the use of particular substances. Such estimates are best interpreted in the light of other ways of estimating harms.

**Keywords:** drug treatment, sex, age, population datasets

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## Introduction

The development of alcohol and other drug (AOD) treatment services should be guided by an understanding of the level and types of need which exists in the general population.[1,2] Australia has well established drug information systems with a number of national data collections publicly available.[3–7] However the Australian population who may be 'at risk' of requiring treatment and the extent that those with problems have sought treatment is uncertain; as is whether there may be drug specific, sex and age differences in treatment. These variables may provide important descriptive information for service planning and for monitoring policy outcomes.

AOD use by females was once considered to be relatively uncommon[8] with research and treatment focusing on the experiences and needs of males.[9,10] Yet about a third of illicit drug users are female[8,10–12] and there seems to be increasing female AOD use in younger age cohorts.[11–13] There is a suggestion that females are under-represented as drug treatment clients.[8,14] A number of investigators have argued that females with AOD problems find treatment inaccessible because they may experience more stigma and marginalisation by the community generally and by treatment services specifically.[15,16] For example females may experience judgemental attitudes from treatment staff[10,17] particularly if they are the primary caregivers for children.[9] Female treatment participation may be inhibited by concerns about losing custody of their children[17–19] and the lack of child care options.[20–22]

AOD use occurs across the life course, with age related declines in AOD prevalence and incidence the norm.[23,24] However there is some concern that the prevalence and incidence of AOD use amongst older persons will increase in the near future. In the United States, researchers have become concerned about a combination of lifetime prevalence and recent increases in AOD use by 'baby boomers' (persons born 1946–1964). Given the ageing Australian population, an understanding of AOD use by older persons will also become increasingly important for policy makers.[23] Despite this our understanding of treatment engagement by older people, and its implications for health care delivery[25–29] has been largely overlooked.[21,23,25,28,30–32]

The need to enter treatment reflects problematic drug use, associated with adverse effects on the health of individuals.[33] This need is likely to involve a subjective perception based upon actual and perceived problems associated with use. Generally treatment services are not focused on a particular substance but are provided for those who self-select because they use pattern is troubling to them. Arguably then the rates of service use provide an indication of sub self-perceived distress associated with the use of a particular substance. Further it can be argued that the use of hospital services represent a greater level of distress and a higher level of impairment and function.

The question of the number of people at risk in need of treatment however is often unknown as there are few available studies of sex and age differences in treatment engagement.[34–36] Several researchers[37–39] have explored methods to investigate the relative harms of different drugs. Whilst these approaches remain contentious, nationally collected data should be able to be used by policy makers and service providers as an indication of the availability of treatment and also as indicator of harms associated with use.[38,40] Indeed to deliver appropriate services we need to know core information about the client group. Two potential indicators of the client group using publicly funded treatment use are rates of people choosing to seek help to reduce their alcohol/drug use and people forced to seek help because of direct/indirect harms from their alcohol/drug use. Using publicly available data it is possible to calculate rates of service use by these using at 'at risk' levels for particular substances.

## Methods

### Data sources

This is a comparative descriptive epidemiological study using the latest complete data from three national Australian data collections, the 2007 National Drug Strategy Household Survey 2007 (NDSHS),[3,12,41] the 2006–2007 Alcohol and Other Drug Treatment Services National Minimum Dataset (NMDS)[7,42] and the 2006–2007 National Hospital Morbidity dataset (NHMD).[43–45] The NDSHS provides triennial data on the number of Australians aged 14 years and over[3] at risk of short term harm from alcohol consumption and who have recently used cannabis, amphetamines and ecstasy. The NMDS consists of nationally collected data items on completed federally funded government and non-government community-based treatment episodes.[46–48] In 2006–2007 this was 633 agencies.[48] For this study AIHW 'data cubes' (interactive

spreadsheets) from the 2006–2007 NMDS was used.[49] The NHMD consists of standard data items collected by publicly funded hospitals on all completed episodes of in-patient care.[45,50] For this study, data from the 2006–2007 NHMD data cube were used.[43]

## 'At risk' measure

'At risk' is defined as those who have been exposed to cannabis, amphetamines and ecstasy through at least weekly use. For alcohol, it is those at risk of short term harm, as defined by the National Health and Medical Research Council[12] and used by the NDSHS 2007. For males this is the consumption of seven or more standard drinks in any one day and for females it is the consumption of five or more standard drinks on any one day.[41,51]

A consistent definition of 'at risk' across all drugs investigated is not possible. Although there are guidelines for alcohol, there is no consensus on 'risky' cannabis, ecstasy or amphetamine use. The criteria for risky use may vary by drug and frequency of use. Despite this there is a need to develop one consistent measure to estimate what constitutes problematic use. As there is consistent data on at least weekly use for all illicit drugs, we have used that measure here.

## Statistical analysis

The numerators are completed treatment and hospital episodes by drug type, sex and age group. For completed treatment episodes these are the counts of each principal drug of concern (ie, alcohol, cannabis, amphetamines, ecstasy). The principal drug of concern is self-reported by the client and represents the drug which led them to seek treatment.[12,46] For completed hospital episodes these are the counts of the designated 'principal diagnosis' codes from the International Statistical Classification of Disease and Related problems (ICD-10)[50] for which code F10,[52] F12 (cannabinoids) and F15 (due to use of other stimulants) have been used.

Neither the NMDS nor NHMDS record the number of concurrent or consecutive treatment episodes for any one individual. This is a limitation of the data.[42] Therefore there are likely to be multiple contacts in both data sources. Hence in the analyses allowances could not be made for repeaters (relapses) which may account higher usage rate of AOD treatment and hospital inpatient care.

The denominator is the number of persons exposed and therefore 'at risk'. The denominators are the population point estimates for self-reported recent use (at least weekly) by cannabis, ecstasy and amphetamines[12,41] by specific sex and age groups. As the level of risk associated with weekly use may vary by the substance used, interpretations of findings are subject to this caveat. Population point estimates were obtained by identifying the number of at last week users (recent users). Use in the last week was obtained from the NDSHS 2007 dataset. The proportion (in percentage) of those in the last 12 months who had recently used was than calculated. This percentage was multiplied by the population estimate of users in the last 12 months to obtain the population estimate for number of recent users. Hence the analysis presented consists of rates of treatment and hospital episodes per 1000 recent users, by drug type, sex and age group.

# Results

Table 1 presents details of overall levels of those who use 'at risk' levels and the level of service use by substance and sex. The population 'at risk' was generally highest for those using alcohol or cannabis. By contrast only relatively modest numbers are using ecstasy and amphetamines. Both treatment and hospital use is a dominated by those seeking help for alcohol problems and then cannabis. A moderate number of those

**Table 1.** Population estimates of those using at 'at risk' levels and service use, hospital (National Hospital Minimum Dataset (NHMD)) and community (National Minimum Dataset (NMDS)).

| Drug | Males | Females |
|---|---|---|
| **Population estimates of those at risk** | | |
| Alcohol | 317,773 | 239,413 |
| Cannabis | 424,229 | 204,600 |
| Ecstasy | 110,993 | 76,748 |
| Amphetamines | 55,357 | 22,871 |
| **Service use – hospital (NHMD)** | | |
| Alcohol | 23,741 | 19,262 |
| Cannabis | 2,157 | 938 |
| Ecstasy | Data not available | Data not available |
| Amphetamines | 2,356 | 1,098 |
| **Service use – community (NMDS)** | | |
| Alcohol | 40,857 | 17,957 |
| Cannabis | 22,017 | 9,368 |
| Ecstasy | 768 | 231 |
| Amphetamines | 11,466 | 5,743 |

seeking services were using amphetamines and very few of those using ecstasy were seeking help. Hospital service use is dominated by those seeking help for an alcohol problem with very small numbers being admitted to hospital for problems associated with cannabis and amphetamines. The numbers admitted to hospital for a problem associated with their ecstasy use is so few that numbers have not been provided.

Table 2 presents details of male to female treatment and hospital episode rates by age group. There are consistently higher rates of treatment for males compared to females across all age categories. Indeed in some instances the treatment episode rate for males using at risky levels is two to three times that for females, particularly for alcohol and ecstasy use in the 20–29 years age group, and in hospital episode rates amphetamines in the 40 plus year age group.

## Discussion

Following the work of Fischer et al (1997), Nutt et al (2007), and Caulkins et al (2011), we have provided broad population data of harm and treatment coverage associated with the most common drugs used by Australians. Overall, we found evidence for population differentials (drug type, sex and age) in Australian publicly funded service utilisation with particularly high service use for alcohol, for males and for the 15–19 years and 40+ year age groups.

Alcohol and cannabis were the major drugs used at 'at risk' levels of harm in the community with comparatively fewer 'at risk' of harmful use evident for ecstasy and amphetamines. This partly reflects the prevalence of risky alcohol consumption in the Australian general population. It confirms the priority implicit in recent national campaigns to reduce the harm associated with alcohol consumption in the Australian general population the need to consider the comparative number of users[39] in primary prevention initiatives.

Treatment rates were higher for males than for females. This challenges the frequently reported finding that females are more likely to seek health care for a problem then are males[53–55] but does confirm previous findings from studies with convenience samples.[8,14] It may be that females present to generalist health services[8,20] such as general practitioners but this unlikely.[56] We have also noted that only a small proportion of GP contacts are for alcohol or drug related health problems.[57] However it is possible that problematic use is not routinely detected in general practice. For instance few older adults with substance problems seek specialised treatment.[21,23] Rather they may present to generalised health services[58,59] with 'atypical presentations'[31] such as chronic non-malignant pain[60] or with other long term and chronic conditions.[23,28,36,61] This may also be the case for females.

**Table 2.** Relative rate (M:F) of use of treatment, National Hospital Minimum Dataset (NHMD) NHMD 2006–2007 and National Minimum Dataset (NMDS) 2006–2007, for alcohol, cannabis, ecstasy and amphetamines, by age group.

| Age group | NHMD | | | NMD | | |
|---|---|---|---|---|---|---|
| | Males | Females | M:F | Males | Females | M:F |
| **Alcohol** | | | | | | |
| 15–19 | 1,267 | 1,031 | **1.23** | 3,111 | 1,238 | **2.51** |
| 20–29 | 2,680 | 1,834 | **1.46** | 10,194 | 3,296 | **3.09** |
| 30–39 | 4,512 | 3,263 | **1.38** | 11,778 | 5,354 | **2.20** |
| 40+ | 15,282 | 10,134 | **1.51** | 15,764 | 8,069 | **1.95** |
| **Cannabis** | | | | | | |
| 15–19 | 334 | 138 | **2.42** | 4,986 | 2,147 | **2.32** |
| 20–29 | 902 | 404 | **2.23** | 9,264 | 3,671 | **2.52** |
| 30–39 | 662 | 290 | **2.28** | 5,216 | 2,393 | **2.18** |
| 40+ | 259 | 106 | **2.44** | 2,551 | 1,157 | **2.21** |
| **Ecstasy** | | | | | | |
| 15–19 | Data not available | | | 204 | 83 | **2.51** |
| 20–29 | | | | 459 | 104 | **4.41** |
| 30–39 | | | | 89 | 34 | **2.62** |
| 40+ | | | | 16 | 10 | **1.6** |
| **Amphetamines** | | | | | | |
| 15–19 | 144 | 115 | **1.25** | 864 | 662 | **1.31** |
| 20–29 | 935 | 516 | **1.81** | 5,152 | 2,668 | **1.93** |
| 30–39 | 950 | 362 | **2.62** | 4,157 | 1,907 | **2.18** |
| 40+ | 327 | 103 | **3.17** | 1,293 | 506 | **2.56** |

**Data Sources:** NMDS 2006–2007, NHMDS 2006–2007.

### Limitations

There remains much contest over measuring 'harms' from drug use.[37–39] We have used criteria for use that are generally associated with problematic patterns of use. However, frequency of illicit drug use is only one of the factors determining harmful use[62] and cannot replace a comprehensive individual or sample assessment of drug use. A range of factors influence the number of treatment episodes, including comorbidity and age of treatment participants. Some of these details are not available. If other factors around drug use, such as quantity, risk behaviours and the co-occurrence of mental illness were also taken into account, it is likely that the assessment of 'at risk'

illicit drug using populations would differ from those estimated here.

Aggregating data from a range of drug information systems has methodological problems.[63,64] Consequently there are a number of technical limitations to the analysis. Our analysis is based upon the most recently used data taken from similar years. Whether these rates are stable across time is unknown. In this study we were also confronted by differences in drug use terminology and counting methods. For instance we were unable to obtain hospital separation data for ecstasy, as this may be accounted for in more than one ICD10 code. It also does not take into account situations in which AOD may be a secondary diagnosis which would increase separation rates.

There were a number of additional ICD codes that can be defined as drug-related hospital treatment such as drug-related injuries and poisoning, however these have not been included in this analysis. If included, these would increase the rate of treatment in specialised facilities. Similarly as the NMDS and the NHMD count treatment episodes and hospital admissions, there are likely to be multiple contacts for any one individual. Hence there is uncertainty over whether there is a small sub-section of drug users very heavily engaged in services.

We have used as our measure of harm completed treatment and hospital episodes and our exposed groups as the number of persons in the general population who have frequently used the specific substances. The harms associated with and treatment coverage is likely to vary drastically between countries. Therefore in broader application of the analysis we recommend clearly defining dataset nuances and applying locally relevant measures of harm and treatment.[37,38]

## Conclusion

Treatment rates vary across drug type, gender and age. It is salutary to note that alcohol and cannabis, in that order, remain the substances which lead to the greatest demand for treatment services. It is possible to calculate population estimates of 'at risk' for licit and illicit drugs use and AOD treatment utilisation within the Australian setting. The policy and political environment of AOD services is intensely political and contested. Although there is some disagreement around harm, there is consensus for developing an evidence base inclusive of risk and benefits associated with AOD use. In constricted financial and political environments it is necessary to consider current treatment coverage and where policy should be focused to reduce the most harm from AOD use. Publicly available data can be used to estimate harms associated with the use of particular substances. Such estimates are best interpreted in the light of other ways of estimating harms.

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## Author Contributions

Conceived and designed the experiments: JAF, AMC, JMN. Analysed the data: JAF, JMN. Wrote the first draft of the manuscript: JAF. Contributed to the writing of the manuscript: JAF, AMC, JMN. Agree with manuscript results and conclusions: JAF, AMC, JMN. Jointly developed the structure and arguments for the paper: JAF, AMC, JMN. Made critical revisions and approved final version: JAF, AMC, JMN.

## Disclosures and Ethics

As a requirement of publication author(s) have provided to the publisher signed confirmation of compliance with legal and ethical obligations including but not limited to the following: authorship and contributorship, conflicts of interest, privacy and confidentiality and (where applicable) protection of human and animal research subjects. The authors have read and confirmed their agreement with the ICMJE authorship and conflict of interest criteria. The authors have also confirmed that this article is unique and not under consideration or published in any other publication, and that they have permission from rights holders to reproduce any copyrighted material. Any disclosures are made in this section. The external blind peer reviewers report no conflicts of interest.

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# Appendix

**Appendix.** Completed hospital (NHMD 2006–2007) and treatment episodes (NMDS 2006–2007) Per 1000 recent alcohol, cannabis, ecstasy and amphetamines users, by sex and age group.

| Age group | Population estimate in the last week | NHMD | | NMDS | |
|---|---|---|---|---|---|
| | | Hospital episodes | Per 1000 | Treatment episodes | Per 1000 |
| **Males** | | | | | |
| Alcohol# | | | | | |
| 15–19 | 26,282* | 1,267 | 48.21 | 3,111 | 118.37 |
| 20–29 | 73,562 | 2,680 | 36.43 | 10,194 | 138.58 |
| 30–39 | 63,864 | 4,512 | 70.65 | 11,788 | 184.43 |
| 40+ | 154,065 | 15,282 | 99.19 | 15,764 | 102.32 |
| Cannabis | | | | | |
| 15–19 | 35,699 | 334 | 9.36 | 4,986 | 139.67 |
| 20–29 | 152,988 | 902 | 5.90 | 9,264 | 60.55 |
| 30–39 | 96,663 | 662 | 6.85 | 5,216 | 53.96 |
| 40+ | 138,879 | 259 | 1.86 | 2,551 | 18.37 |
| Ecstasy | | | | | |
| 15–19 | 7,157 | Data not available | | 204 | 28.50 |
| 20–29 | 68,220 | | | 459 | 6.73 |
| 30–39 | 26,550 | | | 89 | 3.35 |
| 40+ | 9,066 | | | 16 | 1.77 |
| Amphetamines | | | | | |
| 15–19 | 1,063 | 144 | 135.47 | 864 | 812.79 |
| 20–29 | 31,746 | 935 | 29.45 | 5,152 | 162.29 |
| 30–39 | 19,602 | 950 | 48.46 | 4,157 | 212.07 |
| 40+ | 2,948 | 327 | 110.92 | 1,293 | 438.60 |
| **Females** | | | | | |
| Alcohol# | | | | | |
| 15–19 | 23,802 | 1,031 | 43.32 | 1,238 | 52.01 |
| 20–29 | 62,940 | 1,834 | 29.14 | 3,296 | 52.37 |
| 30–39 | 50,583 | 6,263 | 123.82 | 5,354 | 105.85 |
| 40+ | 102,088 | 10,134 | 99.27 | 8,069 | 79.04 |
| Cannabis | | | | | |
| 15–19 | 34,988 | 138 | 3.94 | 2,147 | 61.36 |
| 20–29 | 70,844 | 404 | 5.70 | 3,671 | 51.82 |
| 30–39 | 51,767 | 290 | 5.60 | 2,393 | 46.23 |
| 40+ | 47,001 | 106 | 2.26 | 1,157 | 24.62 |
| Ecstasy | | | | | |
| 15–19 | 11,438* | Data not available | | 83 | 7.26 |
| 20–29 | 31,520 | | | 104 | 3.30 |
| 30–39 | 30,030 | | | 34 | 1.13 |
| 40+ | 3,760 | | | 10 | 2.66 |
| Amphetamines | | | | | |
| 15–19 | 4,392 | 115 | 26.18 | 662 | 150.73 |
| 20–29 | 10,260 | 516 | 50.29 | 2,668 | 260.04 |
| 30–39 | 7,072 | 362 | 51.19 | 1,907 | 269.66 |
| 40+ | 1,147 | 105 | 91.54 | 506 | 441.15 |

**Data Sources:** 2007 NDSHS First Results and Detailed Findings, NMDS 2006–2007, NHMDS 2006–2007.
**Notes:** *NDSHS general population rate is 14–19 years, #risk of alcohol harm in the short term.