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Escalating patterns of emergency health care prior to first admission with amphetamine psychosis: A window of opportunity?

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#### Highlights

- Health service contact escalates before a first amphetamine-related psychosis
- Prior mental health care is less common than for other psychoses
- Prior Emergency Department or medical/surgical admission is more common
- Substance misuse, accidents, injuries and infectious diseases are frequent
- Early detection and referral might prevent some later psychoses

#### Abstract

**Aim:** To describe health service contact in the two years prior to a first hospital admission with amphetamine-related psychosis, and to identify possible opportunities for early intervention.

**Method:** Routine health data collections were used to identify 6,130 persons aged 16-65 who had a first hospital admission with amphetamine-related psychosis in New South Wales (NSW), Australia, between 2005 and 2016. Health service contacts in the two years prior to first admission were identified, using public hospital, emergency department and community mental health data. Prior care was compared to 41,444 people with first psychosis admissions without amphetamine diagnoses.

**Results:** Two thirds of people with amphetamine-related psychosis had health service contact in the two years prior to their first psychosis admission. Of these, 45% had ED contacts and 30% had prior general hospital admissions. The likelihood of contact escalated throughout the two years prior to admission. Prior substance-related conditions, infectious diseases, injuries and accidents were common. Compared to other first psychosis admissions, people with amphetamine-related psychoses were less likely to have prior specialised mental health care (OR 0.84, 95% CI 0.78, 0.89) and more likely to have prior general health care (OR 1.40, 95% CI 1.29, 1.51).

**Conclusion:** Emergency departments and units treating people with infectious diseases or injuries should consider strategies to detect amphetamine and other substance use. Early detection and referral to specialist mental health or drug and alcohol care may prevent some amphetamine-related psychoses.

**Keywords:** Amphetamines; methamphetamine; psychosis; health service use; emergency department; hospitalisation; prevention; care pathways

#### 1. Introduction

Psychostimulant use is a significant contributor to the global burden of disease, and in South East Asia and Australasia methamphetamine is the most commonly used stimulant (Degenhardt et al., 2014). Australia has experienced a significant increase in health system contacts for amphetamine related harms (Degenhardt et al., 2017), leading to significant public concern and an increased policy focus (Department of Health, 2017).

One of the most serious health consequences of amphetamine use is psychosis (Darke et al., 2008). Amphetamine-related psychotic experiences range from brief and transient psychotic symptoms, to more severe episodes of psychosis lasting days or weeks and requiring community or inpatient mental health care. A brief amphetamine-related psychosis of sufficient severity to require hospital admission may be a first step towards developing a more enduring psychotic disorder. Estimates of the rate of progression from drug-induced psychosis to a later diagnosis of Schizophrenia range from 17% to 46% (Alderson et al., 2017; Niemi-Pynttari et al., 2013; Sara et al., 2014). Young adults admitted to hospital with any methamphetamine-related condition have a 10-fold increased risk of later development of Schizophrenia compared with matched controls admitted with appendicitis (Callaghan et al., 2012). In Australian population studies, more than one third of young adults admitted for

amphetamine-related psychoses receive a diagnosis of Schizophrenia at their first hospital admission (Sara et al., 2013).

Psychotic symptoms in amphetamine users are associated with high dose, long term and dependent use, intravenous administration, use of the crystal methamphetamine form, and concurrent use of other substances including cannabis (Lappin et al., 2016; McKetin et al., 2010; McKetin et al., 2013; McKetin et al., 2006). These factors are also likely to be associated with other health-related harms. Therefore, people hospitalised for amphetaminerelated psychoses are likely to have had prior contact with health services for a range of health conditions. These contacts may provide the opportunity for detection of substance use problems and referral for early intervention. Clinical staging models of psychosis propose detection and intervention during the earliest "at risk" states to prevent development of acute episodes of psychosis, or progression to more enduring psychotic disorders such as Schizophrenia (Insel, 2010; McGorry et al., 2010).

Little is known about health contacts prior to a first episode of amphetamine-related psychosis. In people with early psychosis, co-occurring substance use is associated with acute onset and short duration of untreated illness (O'Callaghan et al., 2010). We have previously found that nearly half (49%) of young adults admitted for stimulant-related psychoses had no prior inpatient or community mental health care (Sara et al., 2013). However, no studies have systematically examined broader patterns of health system contact prior to admission with amphetamine-related psychosis.

This study uses a population dataset to identify a cohort of people with a first psychosis admission complicated by amphetamine use disorder, and describes care in the two years prior to their first admission. We examined *where* care occurred (hospital, emergency department and community mental health care), *why* it occurred (psychiatric, substance and/or medical diagnoses) and *when* it occurred (over the two years prior to admission). We

hypothesized that people experiencing a first hospital admission with amphetamine-related psychoses would have a high likelihood of prior contact with mental health, physical health and emergency services, providing potential opportunities for earlier detection and intervention.

#### 2. Material and Methods

The study used routinely collected health service data from government ("public") hospital and community mental health services in the state of New South Wales (NSW), Australia, population 7.2 million. In Australia, public health services provide most acute and emergency care, and all acute and involuntary mental health care. Data use was approved by the NSW Population and Health Services Research Ethics Committee.

#### 2.1 Participants

The method is summarised in Figure 1. Using a unique state-wide person identifier, we identified NSW residents aged 16-64 who had a first admission to a NSW public hospital with a primary or secondary diagnosis of a psychotic disorder. Data were examined from July 2000, and first admissions between July 2005 and June 2016 were included, providing a minimum five-year clearance period per person. Psychosis was defined as the presence of any ICD-10 diagnosis code for a psychotic disorder, including drug-induced psychosis and affective psychoses where psychotic symptoms were specified. Organic Psychoses and Schizotypal Disorder were excluded. Substance disorders were identified by primary or secondary diagnosis codes for abuse, dependence, intoxication or poisoning by alcohol or illicit drugs. Polydrug use disorders were recorded only where specifically diagnosed (ICD Code F19). Single day admissions were excluded.

#### 2.2 Measures

The study group was divided into two mutually exclusive categories; Amphetaminerelated Psychoses and Other Psychoses. Amphetamine-related psychoses were defined by the

presence of specific ICD-10 codes (F15.50-59, F15.70-79), or by the concurrent diagnoses of any psychosis and any stimulant use disorder (F15, T43.6) during the index psychosis admission.

Demographic variables (age, sex, indigenous status, country of birth, area of residence) were obtained from the index psychosis admission. Rurality and disadvantage measures were based on Australian Bureau of Statistics reference data for the statistical local area of residence.

Information on prior care and diagnoses was obtained from administrative data warehouses. This included (i) Emergency Department (ED) contacts, (ii) hospital admission to a specialised mental health unit, (iii) hospital admission without specialised mental health care (i.e., to a medical/surgical ward), and (iv) contact with NSW public Community Mental Health services. For hospital care, diagnoses recorded within medical records by the treating practitioners are extracted by professional coders. ED and Community Mental Health diagnoses are recorded directly by treating clinicians in local clinical information systems. Physical health diagnoses are not included in community mental health data extracts and so were not examined for that setting. Diagnoses were grouped into broad categories using ICD-10 chapter and block allocation. For ED data, diagnoses in SNOMED nomenclature were mapped to ICD-10 diagnoses, and diagnostic sensitivity was increased by automated coding of ED presenting problem text fields (details of all mappings are available from the authors on request). No data were available for specialised drug and alcohol services, primary care or private office-based practitioners.

#### 2.3 Statistical Analysis

Analyses were conducted using Stata SE v13 (StataCorp, 2015). People with and without amphetamine-related psychoses were compared using binary logistic regressions conducted separately for candidate demographic and diagnostic variables. The setting,

problem and timing of service contact in the two years prior to index admission were described and differences compared using binary logistic regression. Regressions were adjusted by inclusion of multiple covariates for significant potential confounders including age (grouped by decade), sex, country of birth (Australia or other), indigenous status (indigenous compared to non-indigenous), rurality (major metropolitan compared to outer metropolitan and rural or remote) and disadvantage based on statistical local area of usual residence (most disadvantaged 40% of state compared to least disadvantaged 60%). Differences in type of prior diagnosis were examined separately for each service setting. The two years prior to index admission was divided into eight three-month periods, and service contacts for each period were quantified. Since ED and Community Mental Health contacts in the 1-2 weeks prior to index admission are likely to have reflected acute management of the episode resulting in admission, the 3 months prior to admission were examined after exclusion of the final two weeks.

#### 3. Results

We identified 62,831 first psychosis admissions in the study period. We excluded 12,677 persons aged younger than 16 or older than 65 and 2,580 who were not NSW residents at the time of first admission, providing a final study group of 47,574 first psychosis admissions. Of these 6,130 (12.9%) had an amphetamine use disorder and formed the "Amphetamine-related psychosis" group. This included 3,411 with a diagnosis of amphetamine-induced psychosis and 2,719 with concurrent diagnoses of another psychosis and an amphetamine disorder.

#### 3.1 Group Characteristics

Characteristics of people with amphetamine-related psychoses compared to other people with a first psychosis admission are reported in Table 1. People with amphetaminerelated psychoses were more likely to be male, indigenous, aged 16-34 and to live in outer

metropolitan and less socially disadvantaged areas. They were significantly less likely to be born outside Australia. Nearly three quarters had a primary diagnosis of a drug-induced psychosis. At index admission, other substance use disorders were common in people with amphetamine-related psychoses, particularly cannabis (42%) and alcohol (21%).

#### 3.2 Care Prior To First Psychosis Admission

Care received in the two years prior to the first psychosis admission is reported in Table 2. Two thirds (67.1%) of people with amphetamine-related psychoses had contact with health services in the two years prior to their index admission. Excluding the two weeks prior to index admission, 41% had prior Emergency Department contacts and 36% had prior contact with community mental health services. More than one third (38%) had prior hospital admissions, most often to non-mental-health units. Compared to other people with psychoses, people with amphetamine-related psychoses were significantly more likely to have prior ED contact and general hospital admission, and less likely to have prior community mental health care.

#### 3.3 Reasons for Prior Care, By Amphetamine Status

People with amphetamine-related psychoses differed from other people with psychoses in their reasons for prior general health care (Table 3). The most common problems in ED and general hospital settings included accidents and injuries, non-psychotic mental health disorders, substance use disorders (amphetamines, alcohol, cannabis and other substances), self-harm, infectious diseases and gastro-intestinal problems. People with amphetamine-related psychoses were significantly more likely to have prior amphetamine disorders, other substance disorders, accidents, injuries and infectious disorders when compared to people with other psychoses.

There were also differences between groups in reasons for prior care in specialised mental health care settings (Community mental health services and hospital admission to

mental-health units, see Table 4). Prior substance use disorders were common, including in 79% of people with prior mental health admissions. Prior mood, adjustment and personality disorder diagnoses were also common. Of those with prior mental health admissions, nearly half (45%) had prior amphetamine use disorder diagnoses. In both settings, prior diagnoses of mood disorders were less likely than in people with non-amphetamine-related psychoses.

The timing of prior care in the two years prior to first psychosis admission is shown in Figure 2. For all service settings, there was a steady increase in the likelihood of service contacts. Between-group differences in patterns of service use, including a greater likelihood of ED contact or general hospital admission in amphetamine-related psychoses, were sustained throughout the two years prior to index admission.

#### 4. Discussion

This is the first study to examine health service contacts prior to a first hospital admission for amphetamine-related psychosis. In this population-based sample of more than six thousand adults admitted for the first time with amphetamine-related psychosis, more than two-thirds had health service contact in the preceding two years.

People with amphetamine-related psychoses were more likely to have prior ED presentations, or hospital admissions with accidents, injuries and infectious diseases when compared to other people with psychoses. Emergency Departments were the most common contact point for this group, and prior admission to general hospital units was more than twice as common as prior admission for specialised mental healthcare. These findings suggest that emergency services and services caring for people with high risk conditions (trauma, infectious disease) should consider routine assessment for both substance use disorders and psychosis risk factors. Substance use disorders are a frequent challenge in emergency departments and trauma services (Corrigan et al., 2010; Jones, 2011; Macias Konstantopoulos et al., 2014; Tetrault and Courtois, 2014). Brief screening tools for drug use

disorders have been developed and validated (Ali et al., 2013; Humeniuk et al., 2008), but have rarely been implemented in these settings. A cost-effective alternative may be the employment of drug and alcohol clinicians in consultation liaison (CL) roles in hospital emergency departments and inpatient units. A program evaluation of Drug and Alcohol CL services in eight NSW hospitals demonstrated improved care in ED and inpatient settings, fewer critical incidents and net annual savings of more than \$A100,000 per hospital (Reeve et al., 2016).

It is possible to screen for risk factors for psychosis in routine clinical care. These risk factors include prior trauma, neurological conditions, the presence of subclinical psychotic experiences and a family history of psychosis (Fusar-Poli et al., 2013; Varese et al., 2012). In some settings, it may also be possible to implement structured screening tools such as the Comprehensive Assessment of At Risk Mental State (CAARMS) (Yung et al., 2005). When psychosis risk factors are present services should consider early referral to psychiatric and/or drug and alcohol services, or encourage information-sharing and follow-up with a primary care practitioner. Where an individual is already in contact with mental health services, presentations to acute health and emergency services should act as a trigger for more assertive assessment and management.

Prior presentations with amphetamine, alcohol, cannabis and other substance use disorders were common in this study. This is consistent with evidence from population studies that amphetamine abuse or dependence are typically part of a broader pattern of substance use (Sara and Burgess, 2010). Efforts to detect and intervene should be broad-based and include a focus on alcohol and cannabis.

#### 4.1 Limitations

A limitation of this study is that we use a case-control design, looking backwards from the known outcome of admission for an amphetamine-related psychosis. Therefore, we

do not know whether the pattern of prior service use in our study subjects differs from that seen in people with amphetamine misuse who were never admitted. We did not seek to answer that question, merely to demonstrate that opportunities for detection and intervention existed in those who *were* later admitted. A cohort design could answer a wider range of questions. However, there is currently no available data source which allows population-wide identification of risk and tracking of linked health data on this issue. Routine Emergency Department data have low sensitivity when identifying amphetamine and other substance problems.

Other limitations arise from the use of routinely collected health service data. We were unable to examine some relevant services (particularly Drug and Alcohol and Primary Care services) due to lack of a routinely linked data source. Including these services should be a priority for broader linkage and future research. There are limitations in the sensitivity and accuracy of diagnostic data in routine health datasets (Valuri et al., 2001). Direct entry of diagnoses by clinicians is associated with higher rates of missing diagnosis, frequent use of non-specific diagnostic categories and limited recording of comorbid conditions. These issues are particularly likely in ED and Community Mental Health data, and therefore we are likely to have underestimated prior substance comorbidity in those settings. Some apparent differences between settings may reflect differences in diagnostic coding and quality rather than true differences in prevalence. This study examines care within the Australian health system: differences in patterns of substance use or health service organisation mean that specific findings may not be generalizable to other health systems.

There are many personal and social differences between amphetamine users and other people with psychosis that may also influence patterns of health system contact. Consistent with prior studies in the Australian population (Sara et al., 2012; Sara et al., 2013), amphetamine-related psychoses were more common in younger men, indigenous people and

outer metropolitan areas, but less common in people born outside Australia and in more disadvantaged areas. We adjusted for these covariates in our analyses of service use, but the imprecision of measurement in routine data may mean that some differences in service use are affected by residual confounding.

Finally, we have described differences in the likelihood of contact with different service types, but we have not identified the amount of contact with individual services. Our study design has not identified subgroups of individuals with more intense service contact, for whom there may be greater risks or greater opportunities for early detection and intervention. Further study should examine this issue in settings where contact was most likely, such as Emergency Departments or trauma services.

#### **5.0** Conclusion

In conclusion, most people admitted to NSW hospitals for a first episode of amphetamine-related psychosis have prior health service contact, often with evidence of problematic use of amphetamines or other substances, or with probable health consequences of substance use. Emergency department contacts and hospital admissions for physical health problems are particularly common. There are opportunities for screening, education and referral which could prevent some later episodes of amphetamine-related psychosis. For some individuals, this may help to prevent the development of enduring psychotic disorders such as Schizophrenia.

**Author Disclosures** 

#### Contributors

GS and JL conceived of and designed the study. TD and LD provided advice on statistical analysis and design. GS conducted data extraction and statistical analyses. GS and JL prepared a draft manuscript. All authors reviewed and contributed to the final manuscript

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#### **Conflict of Interest**

No authors have conflicts to declare

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#### **Figure Legends**

Figure 1: Overview of method

#### NSW Hospital Data July Jun Clearance period 2000 2005 July Jun Observation period 2005 2016 Exclude age <16, age > 65 Non NSW residents First admission per person with a diagnosis of psychosis (n= 47,574) ÷ Amphetamine Other related psychoses psychoses (n=41,444) (n= 6,130) Examine prior service use 2 years prior to first (index) admission Emergency Department presentations Hospital admissions (medical/surgical) Hospital admissions (psychiatric) Community mental health contacts

**Figure 2:** Frequency and type of service contact for quarterly intervals in the two years prior to first psychosis admission, comparing people with (n = 6,130) and without (n = 44,414) comorbid amphetamine diagnoses.



Months prior to first psychosis admission

Table 1: Characteristics of NSW	ISW residents aged 16-65 with a first admission for							
psychosis, 2005-2016, by amph	etamine	e como	prbidity				1	
	N	0	•					
	ampn	etam	Amp	neta		lde Detie	Та	hal
	In	e	mi	ne	00	das Ratio	10	tai
	Num		NU				NU	
Core cotting	Num	0/	mbe	0/			mbe	0/
	ber 41	70 07	r C	70 1 0	UK	95% CI	r 47	<b>70</b>
Total patients	41	07. 10/	120	12.			47	100
	444	1/0	150	970			574	.070
Age group (N_%)								
	8	20	1	29		(1.32	10	21
16-24	569	7%	819	29. 7%	1.43	1.54) ***	388	8%
10 2 1	9	23	2	38	1110	(1.50	12	25
25-34	913	9%	383	9%	1.61	1.73) ***	296	8%
	9	22.	1	22.	1.00		10	22.
35-44	411	7%	401	9%	(Ref)	-	812	7%
	7	18.		7.5	. ,	(0.36,	8	17.
45-54	757	7%	461	%	0.40	0.45) ***	218	3%
	5	14.		1.1		(0.06,	5	12.
55-64	794	0%	66	%	0.08	0.10) ***	860	3%
	16	41.	1	28.		(0.53,	18	39.
Female sex (N, %)	997	0%	729	2%	0.57	0.60) ***	726	4%
	10	26.	010	15.		(0.46,	11	24.
Born outside Australia	881	3%	919	0%	0.49	0.53) ***	800	8%
	2	6.5	725	11.		(1.75,	3	7.2
Indigenous	705	%	725	8%	1.91	2.09) ***	430	%
Location								
	22	57.	3	54.	1.00		25	56.
Major metro	702	3%	093	4%	(Ref)	-	795	9%
	11	29.	1	33.		(1.14,	13	30.
Outer metro	681	5%	921	8%	1.21	1.28) ***	602	0%
D. selection state	5	13.	671	11.	0.04	(0.86,	5	13.
Rural and remote	262	3%		8%	0.94	1.02)	933	1%
Disadvantage								
	21	54.	3	57.	1.00		24	54.
Least disadvantaged 60%	604	5%	273	6%	(Ref)	-	877	9%
	18	45.	2	42.	(	(0.83.	20	45.
Most disadvantaged 40%	041	5%	412	4%	0.88	0.93) ***	453	1%
	_					/		
Primary diagnosis								
	12	29.	586	9.6	1.00		12	26.
Schizophrenia	115	2%	200	%	(Ref)	-	701	7%
	2	5.3	100	1.8		(0.83,	2	4.9
Schizo-affective	206	%	105	%	1.02	1.26)	315	%
	7	17.	199	3.2		(0.48,	7	15.
Affective	317	7%	1.55	%	0.56	0.66) ***	516	8%

	4	11.	100	3.0		(0.70,	4	10.
Acute / Brief	649	2%	186	%	0.83	0.98) *	835	2%
	9	22.	F 4 7	8.4		(1.02,	9	20.
Other / NOS	249	3%	517	%	1.16	1.30) *	766	5%
	5	14.	4	73.	15.8	(14.48,	10	21.
Drug induced	908	3%	533	9%	6	17.38) ***	441	9%
Substance comorbidity								
	0	0.0	6	100			6	12.
Amphetamine	0	%	130	.0%	-	-	130	9%
	6	15.	1	20.		(1.32,	7	16.
Alcohol	414	5%	257	5%	1.41	1.51) ***	671	1%
	5	14.	2	42.		(4.19,	8	17.
Cannabis	855	1%	586	2%	4.44	4.70) ***	441	7%
	207	0.7	220	3.9		(4.87,	<b>F</b> 2 <b>F</b>	1.1
Cocaine	287	%	238	%	5.79	6.89) ***	525	%
	124	0.3	1.1.1	2.3		(5.72,	275	0.6
Hallucinogens	134	%	141	%	7.26	9.21) ***	275	%
	1150	2.8	500	9.8		(3.42,	1	3.7
Opiates	1150	%	599	%	3.79	4.20) ***	749	%
	2	6.8	101	7.6		(1.01,	3	6.9
Polydrug	837	%	464	%	1.11	1.23) *	301	%
Note: * p<0.05, ** p < 0.005, *** p <								
0.0005								

Table 2: Types of service contact in 2 years prior to first admission with psychosis, NSW, 2005-2016, by amphetamine comorbidity status. Odds ratios from logistic regression conducted separately for each service type and after adjusting for age, sex, indigenous status, country of birth, disadvantage and rurality

	N							
	amphe	tamin	Amphe	etami				
	e		ne	9		Odds Ratio	Total	
	Num		Num		0		Num	
Care setting	ber	%	ber	%	R	95% CI	ber	%
Total number of patients	41 4	44	6 130				47 574	
Emergency department								
Overall	16	39.1	2 765	45.	1.	(1.22,	18	39.
	196	%	2703	1%	29	1.36) ***	961	9%
Excluding 2 weeks before	14	34.4	2 5 1 6	41.	1.	(1.26,	16	35.
index admission	244	%	2 510	0%	33	1.41) ***	760	2%
Community Mental Health								
Overall	19	47.8	2 5 9 1	42.	0.	(0.68,	22	47.
	825	%	2 301	1%	72	0.77) ***	406	1%
Excluding 2 weeks before	16	38.9	2 1 7 8	35.	0.	(0.74,	18	38.
index admission	118	%	21/0	5%	78	0.83) ***	296	5%
Hospital admission								
Any bosnital admission	14	34.6	2 211	37.	1.	(1.16,	16	35.
	355	%	2 311	7%	22	1.30) ***	666	0%
Admission to mental health	1 917	11.9	723	11.	0.	(0.86 <i>,</i>	5 670	11.
unit	4 947	%	725	8%	94	1.02)	3070	9%
Admission to other unit	11	26.5	1 81/	29.	1.	(1.23,	12	26.
type	001	%	1014	6%	30	1.39) ***	815	9%
Care group								
No prior caro	13	32.8	2 014	32.	0.		15	32.
No prior care	606	%	2 014	9%	00	-	620	8%
General health care only	7/12	17.9	1 / 26	23.	1.	(1.29,	8 811	18.
	, +10	%	1 720	3%	40	1.51) ***	0 044	6%
Any Mental Health Care	20	49.3	2 690	43.	0.	(0.78,	23	48.
	420	%	2 0 0 0	9%	84	0.89) ***	110	6%
Note: * p<0.05, ** p < 0.005, ***								
p < 0.0005	1							

Table 3. Reasons for prior contact with general health services in the two years before a first admission with amphetamine-related psychoses (n = 6130). Odds ratios compared to people with first admission psychosis without amphetamine comorbidity (n = 44,414). Odds ratios adjusted for age, sex, indigenous status, country of birth, disadvantage and rurality. Individuals may have more than one type of condition or disorder.

	En	nerge	ncy D	Department	Adr	nitte	d gen	eral hospital it
			0					
	N	%	R	95% CI	N	%	R	95% CI
Number of patients	25	16		1	18	14		I
Mental health conditions								
	17	7	0.	(0.63.				
Psychosis	8	%	75	0.88) **	-	-	-	-
Any mental health	11	46	0.	(0.82,	71	39	1.	(0.95,
condition	59	%	90	0.98) *	1	%	06	1.18)
	28	11	0.	(0.66,	21	12	0.	(0.57,
Anxiety/adjustment	7	%	75	0.86) ***	1	%	67	0.78) ***
	18	7	0.	(0.44,	29	16	0.	(0.52,
Affective disorder	2	%	51	0.60) ***	5	%	60	0.68) ***
		1	0.	(0.47,	13	7	1.	(0.86,
Personality disorder	30	%	69	1.02)	1	%	05	1.29)
Cubatanaa waa diaandara								
	47	10	1	(1 47	10	60	2	(2.02
Any substance disorder	47	19		(1.47,	10	00 0/	2.	(2.03,
	0	70 2	05	(2.60	 60 E0	70 20	20	2.51)
Amphotominos	40	2 0/	4.	(2.09,	20	20 0/	7. 05	(0.07,
Amphetamines	10	70 Q	2	(2.14	10	<sup>70</sup>	205	(1.99
Other Illicit drugs #	6	%	2. 58	(2.14, 2 11) ***	40	~~ %	2. 15	(1.00, 2 /17) ***
	0	<i>7</i> 0	0	(0.43	 37	<sup>70</sup> 21	1	(1 53
Cannabis	8	%	94	2 05)	6	%	75	2 01) ***
	23	9	1	(0.99	54	30	1	(1.00
Alcohol	8	%	16	1.35)	1	%	12	1.26)
		70		1.007	-	70		1.207
Other conditions								
	12	48	1.	(1.16.	78	43	1.	(1.08.
Injury/accident	15	%	27	1.38) ***	5	%	20	1.34) **
	41	16	1.	(0.90,	26	15	1.	(0.88,
Self-harm	2	%	01	1.14)	4	%	03	1.19)
	27	11	1.	(0.95,	31	18	1.	(1.18,
Infectious Disease	5	%	09	1.26)	9	%	36	1.56) ***
	49	20	0.	(0.86,	24	13	0.	(0.62,
Gastro-intestinal	2	%	96	1.07)	4	%	72	0.84) ***
	30	12	0.	(0.68,	18	10	0.	(0.52,
Neurological	1	%	78	0.89) ***	5	%	61	0.72) ***
	25	10	1.	(0.87,	19	11	1.	(0.88,
Respiratory	7	%	01	1.16)	7	%	04	1.23)
	22	9	0.	(0.81,	18	10	0.	(0.81,
Cardiac	6	%	95	1.10)	6	%	96	1.14)

		1	0.	(0.46,	15	8	0.	(0.54,
Metabolic	33	%	67	0.97) *	4	%	65	0.78) ***
Note: * p<0.05, ** p < 0.005, *** p								
< 0.0005								
# Other illicit drugs excludes								
cannabis and amphetamines								

Table 4 . Reasons for prior contact with specialised mental health services in the two years before a first admission with amphetamine-related psychoses (n = 6130). Odds ratios compared to people with first admission psychosis without amphetamine comorbidity (n = 44,414). Odds ratios adjusted for age, sex, indigenous status, country of birth, disadvantage and rurality. Individuals may have more than one type of condition or disorder.

care O							
0			it	un			
				0			
% R 95	%	Ν	95% CI	R	%	Ν	
					• •	_	
21/8	1/8	21			23	1	Number of patients
							Mental health conditions
15 0. (0.	15	32					
% 44 0.50)	%	8	-	-	-	-	Psychosis
52 0. (0.	52	11	(0.58,	0.	85	61	
% 70 0.78)	%	25	0.94) *	74	%	2	Any mental health condition
12 0. (0.	12	26	(0.77,	0.	41	29	
% 94 1.08)	%	5	1.07)	91	%	8	Anxiety/adjustment
<sup>'</sup> 17 0. (0.	17	37	(0.43,	0.	35	25	
% 77 0.87)	%	9	0.61) ***	51	%	1	Affective disorder
8 1. (0.	8	18	(0.85,	1.	28	20	
% 09 1.29)	%	5	1.23)	02	%	5	Personality disorder
							Substance use disorders
23 1. (1.	23	49	(3.73,	4.	79	56	
% 99 2.23)	%	7	5.56) ***	55	%	9	Any substance use disorder
1 4. (2.	1		(7.51,	9.	45	32	
% 55 8.00)	%	23	10.99) ***	09	%	2	Amphetamines
22 1. (1.	22	47	(2.17,	2.	30	21	
% 97 2.22)	%	3	3.17) ***	62	%	4	Other Illicit drugs #
1 0. (0.	1		(1.70,	2.	35	25	
% 95 1.64)	%	16	2.44) ***	04	%	1	Cannabis
6 1. (0.	6	13	(1.07,	1.	33	23	
% 16 1.41)	%	1	1.51) *	27	%	9	Alcohol
							Note: * p<0.05, ** p < 0.005, *** p <
							0.0005
							# Other IIICIT drugs excludes
%       R       95 $2178$	%       178       15       %       52       %       12       %       17       %       12       %       13       %       14       %       15       %       1       %       1       %       1       %       1       %       1       %       1       %       6       %       6       %       6       %	N 21 32 8 11 25 26 5 37 9 18 5 7 9 18 5 7 23 47 3 23 47 3 16 13 1	95% CI	R - 0. 74 0. 91 0. 51 1. 02 4. 55 9. 09 2. 62 2. 04 1. 27	%         23         -         85         %         41         %         35         %         28         %         79         %         30         %         30         %         30         %         30         %         30         %         33         %	N 72 61 29 8 25 1 20 5 6 1 20 5 7 20 5 7 20 5 7 20 5 1 20 5 1 20 5 1 20 5 1 20 5 1 20 5 1 20 5 1 20 5 1 20 29 8 25 1 20 29 8 25 1 20 29 8 25 1 20 29 8 25 1 20 29 8 25 1 20 29 8 20 20 20 20 20 20 20 20 20 20 20 20 20	Number of patients         Mental health conditions         Psychosis         Any mental health condition         Anxiety/adjustment         Affective disorder         Personality disorder         Substance use disorders         Any substance use disorder         Amphetamines         Other Illicit drugs #         Cannabis         Alcohol         Note: * p<0.05, ** p < 0.005, *** p < 0