



Full length article

Trends in recreational poisoning in Newcastle, Australia, between 1996 and 2013



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ABSTRACT

Background: Poisoning that occurs as the result using alcohol or drugs for recreational purposes or to induce rewarding psychoactive effects ("recreational poisoning") represents significant harm attributed to drug use. There has been limited focus on recreational poisoning separately from hospital admissions for general harms related to alcohol or drug use. This study aims to detail the drug trends and patient population represented in recreational poisonings in Newcastle, Australia.

Methods: Naturalistic analysis of consecutive hospital presentations following poisoning between January, 1996 and December, 2013 was conducted using data from the Hunter Area Toxicology Service (HATS). 13805 patient records were included (aged 18–98), 1209 (8.8%) of those were recreational poisonings.

Results: Compared to non-recreational poisonings, recreational poisonings were more likely to occur in males than females (OR = 2.87, 95% CI: 2.44–3.40, $p < 0.001$) and in patients under the age of 30 compared to their older counterparts (OR = 1.58, 95% CI: 1.35–1.85, $p < 0.001$). Hospital presentations for recreational poisonings were more likely to occur between 0300 and 0600 h than 0900–1700 h (OR = 3.07, 95% CI: 2.29–4.11, $p < 0.001$) and more likely to occur on the weekend than on a Monday. Overall, recreational poisoning admissions declined over time.

Conclusions: Overall, the trends reported in this analysis reflect general use and availability of alcohol and illicit substances in Australia over the time period. Looking at specific sub-types of alcohol and drug-related harm, like poisoning, is important for service planning and government initiatives.

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1. Introduction

Recreational poisonings, defined here as poisonings that occur as a result of using alcohol and/or illicit or prescribed drugs for recreational purposes or to induce acute rewarding psychoactive effects, represent a significant and potentially lethal form of harm attributed to drug use. Comprehensive reports on alcohol and drug use trends are available for Australia (Roxburgh et al., 2013), United States (Substance Abuse and Mental Health Services Administration (SAMHSA, 2014), Europe (European Monitoring Centre for Drugs and Drug Addiction) (EMCDDA, 2015) and Asia (Dargan and Wood, 2012), though in all reports there has been limited

focus on poisoning as a subset of general drug-related harms. Often recreational poisoning is not separately reported from other drug-related emergency presentations; i.e., it is combined with admissions for drug-induced disease, mental health or injury as a result of engaging in risky behavior while under the influence (EMCDDA, 2015). The lack of detailed data on hospital admissions specifically for recreational poisoning may be partly due to differential hospital coding systems. For instance, some recreational poisoning cases may be coded within a larger category covering all accidental poisonings and hence cannot be differentiated from unintentional overdose of psychoactive medication that was being used for its prescribed purpose. These two presentations would involve patients with very different intentions, and as such patients that require different interventions (compare accidentally taking too many benzodiazepines with the intent to treat anxiety to accidentally taking too many benzodiazepines with the intent to stimulate euphoria). Similarly, the intent associated with recreational

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Table 1
Drugs taken recreationally in poisonings leading to hospital presentation.

Class	Drug	n ^a
Stimulants	Amphetamine ^b	393
	Methamphetamine	79
	Dexamphetamine	49
	Synthetic amphetamine	5
	Methylphenidate	3
	Stimulant (unknown)	3
Hallucinogens	Sympathomimetics	2
	Hallucinogenic plant	66
	LSD	30
	Hallucinogenic mushroom	12
	Ketamine	2
	Dextromethorphan	2
Opioids	Mushroom (unknown)	1
	Hallucinogen (unknown)	1
	Heroin	238
	Methadone	54
	Morphine	21
	Oxycodone	16
	Tramadol	5
	Narcotic (unknown)	4
	Dextropropoxyphene	2
	Dextromoramide	1
Non-narcotic analgesics	Fentanyl	1
	Codeine phosphate	1
Cannabis and synthetic cannabis	Paracetamol	69
	NSAID	27
Ecstasy	Cannabis	93
	Synthetic cannabinoids	4
Cocaine and synthetic cocaine	MDMA	59
	MDA	5
Sedatives	Cocaine	19
	Synthetic cocaine	2
Alcohol	Benzodiazepines	231
	Antihistamines	17
	Barbiturates	1
	Alcohol	495

LSD, lysergic acid diethylamide; MDMA, methylenedioxy-methamphetamine; MDA, methylenedioxyamphetamine.

^a Not mutually exclusive.

^b Information on the specific type of amphetamine was not provided for this subset. Note that amphetamines listed within this category here may include other amphetamines such as dexamphetamine or methamphetamine.

poisoning may also be coded differently across various hospitals. For example, while ingestion of the illicit or dangerous substance to stimulate psychoactive effects is “intentional” the patient may have not necessarily intended to poison themselves when they took the substance. Poisoning that occurs as a result of using substances for “fun” or “leisure” presents an area of concern, given that non-fatal poisoning associated with recreational drug use may be associated with future fatal overdose, which has previously been shown for opioids (Stoove et al., 2009) and the increasing use and abuse of drugs and alcohol worldwide (Dargan and Wood, 2012; EMCDDA, 2015; Roxburgh et al., 2013).

Identifying trends in recreational poisoning will enable better planning of drug and alcohol services and government initiatives to reduce harms and consequences associated with drug and alcohol use. Furthermore identifying these trends can be used to gauge the extent that existing policies have tapped into this specific sub-type of drug-related harm, for example changes in liquor licensing, or the effect of drug-related circumstances that are known to change the availability of illicit substances, such as increasing prices of heroin or decreasing prices of ecstasy (Roxburgh et al., 2013).

The Hunter Area Toxicology Service (HATS) is the primary poisoning treatment service in Newcastle, Australia. Poisoning

admissions to HATS have been comprehensively recorded and coded, providing a unique opportunity to assess trends in recreational poisoning in a metropolitan area in Australia. Using this data the study aimed to detail the drug trends and patient population represented in recreational poisonings. It was hypothesized that hospital presentations for recreational poisonings would generally reflect drug and alcohol use patterns in Australia. Specifically, we hypothesized that young males would be most likely to present for recreational poisoning, and that alcohol would be the most common drug ingested.

2. Materials and methods

2.1. Database

Data was acquired from a cohort study from 1987 to 2014 of consecutive poisoning presentations to HATS (Buckley et al., 2015, 1999). In 1996, the database underwent changes and data collection was modified. Therefore in to provide the most consistent representation of recreational drug trends we have only use data since 1996. HATS has direct clinical responsibility for all adult poisoned patients in all hospitals in greater Newcastle and provides a tertiary referral service to Maitland and the Hunter Valley, covering a population of around 500,000. HATS provided a comprehensive 24 h per day toxicology treatment service and routinely records data on all patients who present to hospital for poisoning (Buckley et al., 2015). A structured data collection form is used by HATS for prospective collection of information on patient demography (age, gender), all drugs and doses ingested, co-ingested substances, regular medication, details of management and complications of poisoning (Buckley et al., 1999). Information regarding the type of poisoning is also collected from the patient at admission and is coded into one of the following categories: intentional (a deliberate attempt to self-harm with any substance), recreational (poisoning that occurs as a result of recreational use of a substance(s)), accidental (unintentional poisoning that occurs as a result of accidentally taking too much medication or ingesting a toxic substance), environmental (unintentional poisoning that occurs from environmental toxicants, e.g., insecticides), envenomation (poisoning that occurs as a result of the bite or sting of a venomous animal) or iatrogenic (poisoning that occurs as a result of a medical complication/dispensing or prescribing error, etc.). Data are entered routinely on a fully relational research Microsoft Access (Microsoft, Washington, US) database separate to the hospital's main medical record system. The Hunter New England Area Health Service Human Research Ethics Committee has granted an exemption regarding use of the HATS database and patient information for research.

2.2. Inclusion criteria and coding

Fig. 1 shows the inclusion flow diagram for the sample from the larger HATS database as described previously (Buckley et al., 2015). Cases were included if the patient was 18 years or older, was admitted to a hospital within 10 km of the Newcastle central business district (CBD) and if the toxin was a therapeutic substance or a recreational drug (e.g., patients who ingested substances such as essential oils or soap were excluded). If the patient had a repeat presentation to the toxicology service it was included in the trend analysis, but only the patients' first admission was used to establish the characteristics of the sample and of recreational poisonings. Patients were split into those aged under versus those aged over 30 years, based on increased likelihood to use alcohol and illicit substances in those under 30 reported in the National Drug Strategy Household Survey (2014). Records were

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