

**ADVICE TO  
THE EXPERT ADVISORY COMMITTEE ON DRUGS  
ON:**

**HALLUCINOGENS**

**May 2009**

**PREPARED BY  
THE MINISTRY OF HEALTH**

## EXECUTIVE SUMMARY

This paper provides an overview of information on hallucinogens.

- Hallucinogens can be divided into different classes according to their action on different receptors in the brain.
- Most hallucinogens are scheduled as Class A controlled substances in the Misuse of Drugs Act 1975 (MoDA). Exceptions include MDMA and 4-MTA, ketamine, and preparations of *Salvia divinorum*,
- The hallucinogens which are not scheduled under the MoDA include scopolamine found in plants like *Datura stramonium*, ibogaine and nutmeg.
- The EACD has previously considered LSD, MDMA, 4-MTA, *Salvia divinorum* and ketamine.
- Prevalence data suggest that current use of the hallucinogens such as LSD and psilocybin is low, although the use of MDMA appears to be rising.
- The effects of hallucinogens vary according to substance, dose, user and the context of use. Effects include visual hallucinations, euphoria, and the distortion of time and space.
- The acute harms associated with hallucinogens include anxiety, amnesia, stupor, tachycardia, nausea and vomiting. There is also the potential for more long-term effects, such as flash backs. There is a low risk of death associated with hallucinogen use, although some have been traditionally used as poisons. There is no evidence of dependence or withdrawal with the use of the majority of substances (PCP being the probable exception).
- There are an increasing number of trials to investigate the therapeutic use of different hallucinogens for a variety of psychiatric conditions.
- In other jurisdictions, hallucinogens tend to be classified in the highest schedule, with the general exception of ketamine. As in New Zealand, current rates of use are generally low.

## SUBSTANCE IDENTIFICATION

The term hallucinogen is commonly used because in high enough doses, the substances collectively referred to in this way can cause hallucinations. They are also referred to as “psychotomimetic” because of their alleged ability to induce psychosis, although this is disputed. Others use the term psychedelic to describe the ability of these substances to alter sensory perception. Although there are a number of ways to classify hallucinogens, this paper will divide substances into five categories, namely:

1. **Anticholinergic** or atropinic drugs: such as scopolamine (found in *Datura stramonium* and *Atropa belladonna*)
2. **Catecholaminelike** or phenylethylamine drugs: such as MDMA and mescaline.
3. **Serotoninlike** or indolealkylamine drugs: such as LSD and psilocybin.
4. **Glutaminergic NMDA receptor agonists**: such as phencyclidine (PCP) and ketamine.
5. **Kappa opioid receptor agonist**: salvinorin A (*Salvia divinorum*).

One substance that appears to span several of these classes is ibogaine which affects several neurotransmitters at the same time. Some include cannabis as a hallucinogen. Unlike the other hallucinogens, THC and other cannabinoids act via specific cannabinoid receptors.

## CURRENT CLASSIFICATION

Most hallucinogens are scheduled in the Misuse of Drugs Act 1975 (MoDA) as Class A controlled substances. All the serotoninlike drugs and most of the catecholaminelike drugs are Class A; the exception is MDMA which is a Class B1 controlled drug. Both LSD and its precursor lysergic acid are Class A; lysergic acid is also listed under Schedule 4 as a precursor substance. Of the other classes of hallucinogens, PCP is a Class A controlled drug and ketamine is due to be scheduled as a Class C4. Preparations of *Salvia divinorum* are due to be scheduled as restricted substances under the Misuse of Drugs Amendment Act 2005.

Under the MoDA, certain plants are prohibited, including *Lophophora williamsii* and *Lophophora lewinii* (peyote) and any fungus of the genera *Conocybe*, *Panaeolus*, or *Psilocybe*.

Those hallucinogens which do not appear to be scheduled under the MoDA include scopolamine, found in *Datura*, and myristin and elemicin which are found in nutmeg and mace. Ibogaine is also not scheduled in New Zealand, although it is prohibited in the USA, Australia and France.

## **PREVIOUS CONSIDERATIONS BY THE EACD**

In 2002, the EACD recommended that, as 4-MTA was similar to MDMA, it should be classified as a B2 controlled substance. 4-MTA was added to the MoDA in 2003.

In 2004, the EACD considered MDMA and recommended that it was moved from a Class B2 to a Class B1 controlled substance. An amendment to this effect was made in 2005.

LSD was first considered by the EACD in 2003 when the Committee recommended no change to its classification. At this meeting, the EACD requested additional papers which subsequently led to a discussion about anomalies in scheduling of certain Class A substances. A further paper was requested by the EACD to compare LSD with methamphetamine.

The EACD agreed, in 2006, that LSD does not appear to be as harmful as many other Class A drugs, especially methamphetamine. However, members also agreed that LSD is not alone in this respect and there are other anomalies in the classification of substances, probably for historical reasons. It was decided that there would be no recommendation to change the classification of LSD, however, the EACD agreed to investigate obligations under the UN Conventions and learn from the experiences of other jurisdictions about ways of classifying and controlling drugs. The EACD also agreed to write to the Minister to discuss apparent anomalies in the classification system.

In 2005, the EACD recommended that ketamine be scheduled as a Class C4 controlled substance and, in 2007, agreed that the presumption for supply be 10g. A Notice of Motion needs to be lodged before this classification comes into effect.

In 2006, the EACD advised that the definition of amphetamine analogues in Schedule 3, Part 7 of the MoDA be amended to include the words “and/or alkythio radicals” after “alkylamino radicals”. This amendment would allow for the controlled drug analogue provisions to control a wider range of phenethylamine type substances that could potentially be introduced into New Zealand, including 2C-T-7. This is being progressed.

In 2007, the EACD recommended that preparations of *Salvia divinorum* be made restricted substances under the Misuse of Drugs Amendment Act 2005.

## **SCOPE OF THE FOLLOWING OVERVIEW OF HALLUCINOGENS**

This paper will not consider MDMA, ketamine or *Salvia divinorum*. MDMA was considered in 2004 by the EACD and, although an update would be of value, it was thought that MDMA warranted separate consideration owing to the body of available information.

Both ketamine and *Salvia* have been discussed recently by the EACD.

Whilst LSD has also been considered relatively recently, much of the general data on hallucinogens are likely to include LSD and it is possible to update previous data on use and availability.

## LIKELIHOOD OR EVIDENCE OF ABUSE

### New Zealand prevalence data

There are limited data available on the use of hallucinogens in New Zealand but, in the case of the serotoninlike drugs, there is information on LSD and psilocybin. With LSD in particular, it is apparent that in spite of relatively high “ever used” rates, current use has been falling for several years. Provisional results from the 2007 Alcohol and Drug Use Survey confirm this with last year use of “LSD/DMT and other synthetic hallucinogens” at 1.2% (for 16-65 year olds).

<b>NEW ZEALAND NATIONAL HOUSEHOLD DRUG USE SURVEYS <sup>1</sup></b>				
<b>LSD</b>				
	<b>1998</b>	<b>2001</b>	<b>2003</b>	<b>2006</b>
Ever Tried	8.9%	9.7%	8.1%	8.5%
Last Year Used	3.9%	3.2%	1.9%	1.8%
Last Month Used	1.0%	0.5%	N/A	0.4%
<b>Psilocybin</b>				
	<b>1998</b>	<b>2001</b>	<b>2003</b>	<b>2006</b>
Ever Tried	7.6%	9.0%	7.8%	7.9%
Last Year Used	2.2%	2.4%	1.9%	1.6%
Last Month Used	0.5%	0.6%	N/A	0.2%

According to the NZ Police Arrestee Drug Abuse Monitoring (NZ-ADAM) 2007, 52% of those participating in the survey reported that they had ever used hallucinogens and of those 61% tried them under the age of 18. Only 7% had used hallucinogens in the month preceding arrest and 1% in the 48 hours preceding arrest. Compared to other substances, particularly alcohol, there were very low self reports of feelings of anger, dependence or impaired driving associated with hallucinogens<sup>2</sup>.

In terms of hallucinogens, the 2007 Illicit Drug Monitoring System (IDMS) collects information about LSD (as well as ketamine and MDMA). It notes the availability of LSD varied from being "difficult/easy" with the frequent methamphetamine users being more likely to say that the availability of LSD has become "more difficult" in the past six months. It notes no change in the perception of the price of LSD nor its prevalence. Of note, is that the IDMS recognised that while overall the number of people using seemed to be stable, there appeared to be some increase in use among those in the dance party community.

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<sup>1</sup> Wilkins & Sweetsur. 2007.

<sup>2</sup> NZ-ADAM, 2007.

At the meeting of the EACD in November 2008, ESR reported on a number of hallucinogens that had come to their attention. NZ Customs had submitted a case of white powders imported from China which were found to be analogues of DMT (N,N-dimethyltryptamine) which is a Class A controlled drug.

An increase in LSD submissions was reported by ESR and an increase in other novel/obscure hallucinogenic substances, including Bromo-LSD. There were also several seizures of Iodo-DMA (DOI) which is an analogue of Br-DMA (DOB) which was commonly used in New Zealand in the 1980s and is a Class A synthetic amphetamine structurally related to mescaline.

### Seizures

The limited market of LSD in New Zealand appears to be supplied through international trafficking, rather than domestic production. Psilocybin on the other hand is generally supplied domestically. The table below highlights combined seizures made by Police and Customs combined over the past three years:

<b>LSD</b>	<b>2005</b>	<b>2006</b>	<b>2007<sup>3</sup></b>
Number of Seizures	40	69	41
Amount seized (tickets)	1,529	3,483	1,031
<b>Psilocybin</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
Number of Seizures	37	24	29
Amount seized (number of mushrooms)	728	396	274
Additional grams seized	1765.7g	698.14g	845.9g

The current street price for a retail tab of LSD is approximately \$15-\$40; while a wholesale tab sells for around \$15-\$25. According to the National Drug Intelligence Bureau, there is no information on the price of psilocybin or the other hallucinogens covered in this paper.

### SPECIFIC EFFECTS OF THE DRUG

#### Anticholinergic or atropinic drugs:

*"Blind as a bat, mad as a hatter, red as a beet, hot as a hare, dry as a bone, the bowel and bladder lose their tone, and the heart runs alone."* (a traditional saying)

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<sup>3</sup> NDIB. 2008

Scopolamine is found in high concentrations in plants such as *Datura stramonium*, *Atropa belladonna* and *Mandragora officinarum*. These plants have been used for centuries both as poisons and for medicinal and spiritual reasons.

Scopolamine is an acetylcholine receptor agonist which blocks the access of acetylcholine to its receptors leading to dry mouth, blurred vision, increased heart rate and body temperature and urinary retention. It can also lead to sedation, amnesia and delirium. In higher doses, symptoms include hallucinations, euphoria and restlessness and very high doses can cause toxic psychosis and respiratory depression. In the case of *Datura*, for instance, the onset of symptoms occurs within 30 to 60 minutes after smoking leaves or drinking tea; and 1-4 hours after ingestion of plant material or seeds. The duration of symptoms is often 24-48 hours because of delayed gastrointestinal motility.

### **Catecholaminelike drugs:**

Norepinephrine and dopamine receptors are the sites of action for this group of hallucinogens which are structurally similar to catecholamine neurotransmitters and amphetamines. In addition to their amphetamine psychostimulant properties, they have a methoxy group on the phenyl ring structure which gives them hallucinogenic properties. They are thought to be agonists at the postsynaptic serotonin receptors 5-HT<sub>2A</sub> as is the case with the serotoninlike drugs. Their interaction between dopamine and serotonin is why they are seen to fall between the hallucinogens and stimulants.

This is a big group of drugs and includes synthetic amphetamine derivatives such as MDMA, MDA and DOM, and organic substances, including mescaline and myristin and elemicin (from nutmeg). Nutmeg was used for centuries as a snuff; ingesting large quantities can produce vomiting, dry mouth and hallucinations and a sleepless stupor.

Mescaline is found in cacti, including peyote and in a lesser concentration in San Pedro (*Trichocereus pachanoi*) and it is also produced synthetically. Peyote is a prohibited plant in New Zealand and banned in the USA except for use by the Native American Church for which it is sacred.

### **Serotoninlike drugs:**

As the name of this group indicates, these hallucinogens bear structural resemblance to serotonin and are thought to exert their effects through interactions at serotonin synapses, especially the 5-HT<sub>2</sub> and 5-HT<sub>2A</sub> receptors. It is thought that the process by which these hallucinogens alter mood and perception is through the pontine (dorsal) raphe. This is where incoming sensory stimuli are filtered and it is believed that the hallucinogens might interrupt the filtering and allow a surge of sensory data making the familiar seem novel.

This group of drugs includes LSD, psilocybin, DMT and bufotenine. LSD is a synthetic drug, whose precursor lysergic acid was isolated from ergot, a fungus which attacks rye. Historically ergot has caused mass poisonings through contaminated bread but has also been used traditionally in midwifery.

Bufotenine derives its name from the toad genus *bufo* and refers to toad secretions which have been smoked for centuries. The structural similarities between the chemical properties of certain toads and mushrooms explain the term toadstool.

DMT is a short-acting compound that is found naturally in the blood and brain although its function is not well understood. Some plants contain DMT in combination with alkaloids which enable its psychoactive properties by inhibiting the MAO (monoamine oxidase) enzyme, such as *Virola calophylla* and *Mimosa hostilis*. DMT is one of the principal ingredients (along with harmine a MAO enzyme blocker, found in *Banisteriopsis caapi*) in the hallucinogenic drink ayahuasca consumed for religious and medical purposes in the Amazon. If DMT is taken without the MAO inhibitor, its effects last only about 30 minutes and has been called “business man’s lunch”.

Psilocybin-containing mushrooms grow throughout much of the world. The effects last around 6-10 hours, although there is considerable variation between different species. There is evidence that psilocybin has been used for religious and medical purposes for over 1000 years in the Americas.

### **Glutaminergic NMDA Receptor Agonists:**

Phencyclidine (PCP) and ketamine are dissociative anaesthetics; their psychedelic effects are different from the other hallucinogens as they do not act on the serotonin, acetylcholine or dopamine receptors. PCP was initially used as a human anaesthetic but use was ceased owing to psychiatric reactions, including delirium and hallucinations. Recreationally PCP is taken orally or smoked. It is thought that this group of drugs bind as non-competitive antagonists of the N-methyl-D-aspartate (NMDA) glutamate receptors which are the receptors commonly implicated in the pathophysiology of schizophrenia. High doses of PCP can induce amnesia, psychosis, coma or stupor; a psychotic state can last for weeks following use.

Dextromethorphan (DXM) has a similar effect to PCP or ketamine blocking the NMDA receptor. DXM is found in cough and cold preparations such as Robitussin and there are accounts of its misuse. Intoxication can cause tachycardia, hypertension and hallucinations.

### **Kappa Opioid Receptor Agonists:**

Salvinorin A is distinct from other hallucinogens as it is active at only one receptor: the kappa opioid receptor upon which it exerts an agonist action. This receptor is thought to regulate human perception. Salvinorin A is the main active ingredient of *Salvia divinorum*.

### **Ibogaine:**

Ibogaine has an indole alkaloid structure which is similar to LSD but its unique properties make it difficult to categorise in one of the above classes of hallucinogens. Ibogaine appears to decrease extracellular levels of dopamine, for instance blocking the dopamine released by opiates, cocaine and nicotine. It binds to the kappa opioid and NMDA receptors and the serotonin uptake sites. It is also thought to bind to the sigma-2 and nicotinic receptors.

Ibogaine is found in the root of the *Tabernanthe iboga* which grows in equatorial Africa where it is used, in low doses, to combat fatigue and hunger and, in higher doses, for religious reasons to induce visions. After ingesting the powdered bark of the root the effects are felt within 20 minutes, leading to hallucinations, tremor and abnormal breathing; the effects can last for over 30 hours.

## **RISKS TO PUBLIC HEALTH**

Hallucinogens are considered fairly safe physiologically and are not drugs of dependence, however there are psychological harms associated with their use. Owing to the distortion of time and space, which often accompanies the use of hallucinogens, driving is a risk to public health.

The greatest risk to health from psilocybin is from accidentally ingesting poisonous mushrooms as there are many similarities between species with psychoactive properties and poisonous fungi.

Other risks associated with all classes of hallucinogens are principally associated with psychological complications including amnesia, frightening visual hallucinations, flash backs and the exacerbation of pre-existing psychiatric conditions. The effects on the individual vary considerably depending on drug, dose and context in which the drug is consumed. Psychotic reactions are rare but have been associated with the use of the serotoninlike drugs and scopolamine.

Acute toxic reactions have been reported following the use of certain catecholaminelike drugs such as DOM, use of which can lead to convulsion and even death. Other hallucinogens can cause tremor, tachycardia, nausea and vomiting.

## **THERAPEUTIC VALUE**

Hallucinogens have been used for over a thousand years for spiritual and medical reasons and their sacred status meant that they were not used for recreational purposes until they gained popularity in the sixties in the USA and Europe.

### **Serotoninlike drugs:**

Although there was initial interest in the medicinal properties of this class of hallucinogens, research stalled in the seventies when the use of these drugs was prohibited. By 1965, over 2000 papers had been published describing positive results from the use of hallucinogens for 40 000 patients with a variety of conditions<sup>4</sup>. Hallucinogens were trialled in the treatment for severely autistic children as it was considered that they could enhance the ability to see the connectivity between people and objects<sup>5</sup>. The pharmaceutical company Sandoz manufactured synthetic psilocybin for psychiatric use as Indocybin until 1965 when it became illegal in the USA.

Early research focused on the study of hallucinogens as models for psychosis and research in this area has begun again with modern brain imaging techniques<sup>6</sup>. Since the 1990s, research has started into the effects of drugs including DMT, psilocybin and other hallucinogens for the treatment of psychiatric conditions including obsessive-compulsive disorder and anxiety<sup>7</sup>. Research is underway at the Johns Hopkins University School of Medicine on the effects of psilocybin on cancer

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<sup>4</sup> Sessa. 2005.

<sup>5</sup> Sessa. 2008

<sup>6</sup> Johnson et al. 2008

<sup>7</sup> Johnson et al. 2008.

patients. This study is being done to find out if psilocybin can also produce personally and spiritually meaningful experiences in cancer patients. This could be important because spirituality has been associated with increased psychological coping and decreased depression in serious illness.<sup>8</sup>

Bufotenine is not generally found in healthy people but it can be produced in an alternate metabolic breakdown of serotonin. Research has been conducted on patients in psychiatric wards and on violent offenders where urine samples tested positive for bufotenine indicating that it could be a marker for certain psychiatric disorders including autism, paranoia and psychosis<sup>9</sup>.

**Anticholinergic drugs** are used for asthma and colds, for instance guaifenesin is found in cough and cold syrups for its anti-secreting properties. Scopolamine is used in travel sickness products such as motion-sickness patches.

### **Catecholaminelike drugs**

There are accounts of peyote being used among certain Native American groups to help with alcohol addiction for which it is apparently highly effective<sup>10</sup>. Research has been conducted into the therapeutic benefits of MDMA, including for the treatment of post traumatic stress disorder<sup>11</sup>.

**Ibogaine** is an interesting substance because it interacts with a number of different receptors and for this reason is seen as a potential treatment for addiction to opiates, cocaine, alcohol and nicotine<sup>12</sup>. Before it was scheduled, ibogaine was synthesised for use in addiction treatment and sold under the name Endabuse in the USA. Claims of its effectiveness have been met with some scepticism, however the National Institute on Drug Abuse has added ibogaine to the list of drugs that show promise as a treatment for drug dependency.

## **POTENTIAL TO CAUSE DEATH**

Some of the anticholinergic hallucinogens, as previously mentioned, have been traditionally used as poisons. The seeds and berries of *Datura* are toxic. The defeat of Marc Anthony's army in 36BC has been blamed on the accidental ingestion of *Datura* berries. Belladonna is also a well-known poison.

Deaths associated with the toxic effects of the serotoninlike hallucinogens are rare and may be related to over-activity of the adrenal glands in reported cases<sup>13</sup>. An effective dose of LSD is less than 50 micrograms and the lethal dose is around 14,000 micrograms<sup>14</sup>. Most deaths attributed to this class of hallucinogens result from accidents or suicides

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<sup>8</sup> <http://clinicaltrials.gov/ct2/show/NCT00465595>

<sup>9</sup> Julien, R. 2005.

<sup>10</sup> Beauvais, F & LaBoueff, S. 1985. Drug and alcohol abuse intervention in American Indian communities; in *Int J Addict* 20:139-71. Cited in Gahlinger, 2004

<sup>11</sup> For instance Parrott AC. 2007.

<sup>12</sup> Gahlinger, 2004.

<sup>13</sup> Blaho et al. 1997.

<sup>14</sup> Juliean. R. 2005.

## **ABILITY TO CREATE DEPENDENCE**

Generally, hallucinogens are not considered to cause physical dependence and PCP is the only hallucinogen self-administered by monkeys. In humans a similar pattern of compulsive use has been seen<sup>15</sup>.

For the serotoninlike hallucinogens, tolerance occurs rapidly but is lost within several days.

## **INTERNATIONAL CLASSIFICATION AND EXPERIENCE IN OTHER JURISDICTIONS**

### **United Nations Commission Scheduling**

Most of the hallucinogens, including LSD, MDMA, DMT are incorporated within Schedule 1 of the 1971 Convention on Psychotropic Substances, which includes drugs claimed to create a serious risk to public health, whose therapeutic value is not currently acknowledged.

According to a commentary on the Convention by the United Nations Office of Legal Affairs "the cultivation of plants from which psychotropic substances are obtained is not controlled by the Vienna Convention. (...) Neither the crown (fruit, mescal button) of the Peyote cactus nor the roots of the plant *Mimosa hostilis* nor *Psilocybe* mushrooms themselves are included in Schedule 1, but only their respective principles, mescaline, DMT and psilocine, psilotsin"<sup>16</sup>.

### **USA**

In the USA, hallucinogens are generally classified within Schedule I of the Federal Controlled Substances Act 1970, although ketamine is in Schedule III. Schedule I drugs are considered to have a high potential for abuse and to have no medical value (for this reason cocaine is a Schedule II drug as it has certain medical value).

There is little evidence that ibogaine is used recreationally and is associated solely with its ritual use in Africa or in therapeutic trials for addiction. However, in 1967, ibogaine was classified as a hallucinogenic substance by the World Health Assembly and thus it was classified as a Schedule 1 substance, along with LSD, in the USA. There is a possibility that ibogaine will be rescheduled to allow for medical use<sup>17</sup>.

Peyote can be used legally by members of the Native American Church and the Supreme Court ruled in 2006 that the use of ayahuasca (which contains DMT and harmine) should be allowed for members of a Brazilian syncretic church<sup>18</sup>.

As in New Zealand, life time use of LSD is relatively high, recorded at around 9.5% in 2006 but current use is low (according to the National Survey). Life-time use of PCP

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<sup>15</sup> Julien, R. 2005.

<sup>16</sup> According to Commentary on the Convention by the UN Office of Legal Affairs [http://www.maps.org/pipermail/maps\\_forum/2001-March/003376.html](http://www.maps.org/pipermail/maps_forum/2001-March/003376.html)

<sup>17</sup> Gahlinger. 2004.

<sup>18</sup> Johnson et al. 2008.

is reported at 2.7%. According to the Monitoring the Future survey, life-time use of hallucinogens other than LSD by young people was 7.7%.<sup>19</sup>

## UK

In the UK, hallucinogens are generally scheduled in Class A of the Misuse of Drugs Act 1971. Ketamine has recently been scheduled as a Class C controlled substance. The scheduling of hallucinogens, including LSD, MDMA and 4-MTA has been criticised as anachronistic by Nutt et al in their 2007 article in *The Lancet*. Ibogaine is not scheduled in the UK.

Recent research on dance drug users in the UK has found a decline in the prevalence of LSD use. However, the use of other hallucinogens, such as psilocybin, has risen<sup>20</sup>.

## Europe

According to the data from the 2008 EMCDDA Annual Report<sup>21</sup>, LSD use and trafficking is still considered marginal, although seizures in Europe are possibly suggestive of a revival in interest in the drug in the last few years. After a long-term downward trend dating back to the 1990s, both the number and the quantity of seizures increased from 2003 but might be declining again<sup>22</sup>. LSD retail prices (adjusted for inflation) have been slightly declining since 2001, and ranged in 2006 between EUR 5 and EUR 11 per unit in most European countries. Last year use in Europe ranges from 0.3-3%.

## Australia

According to a national study of injecting drug users, 72% reported having used hallucinogens at some stage in their life. However, recent use and frequency of use was low, with 9% reporting use in the six months prior to interview. The same study reported that LSD was the main hallucinogen used (67% of hallucinogen users or 6% of the entire sample), followed by psilocybin-containing mushrooms (16% of hallucinogen users or percent of the entire sample)<sup>23</sup>

LSD detections at the Australian border remain a rarity - there have been a total of 28 such detections since 1999. There were four Customs detections of LSD in 2006–07, one more than the previous year.

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<sup>19</sup> <http://www.drugabuse.gov/infofacts/hallucinogens.html>

<sup>20</sup> McCambridge. 2007

<sup>21</sup> 2008 Annual report: the state of the drugs problem in Europe, *EMCDDA, Lisbon, November 2008*  
<http://www.emcdda.europa.eu/publications/annual-report/2008>

<sup>22</sup> This was provisional on data from the UK (the highest users in Europe) which was unavailable at the time of publication.

<sup>23</sup> Illicit Drug Data Report 2006-07 [http://www.crimecommission.gov.au/html/pg\\_iddr2006-07\\_revised.html](http://www.crimecommission.gov.au/html/pg_iddr2006-07_revised.html)

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