

DRUGS AND THE INTERNET

Issue 1, August, 2013

Funded by The Australian Government Department of Health and Ageing

Product of: The National Illicit Drug Indicators Project

Recommended Van Buskirk, J., Roxburgh, A., Bruno, R., and Burns, L. (2013). Drugs and the Internet, Issue 1, August 2013.

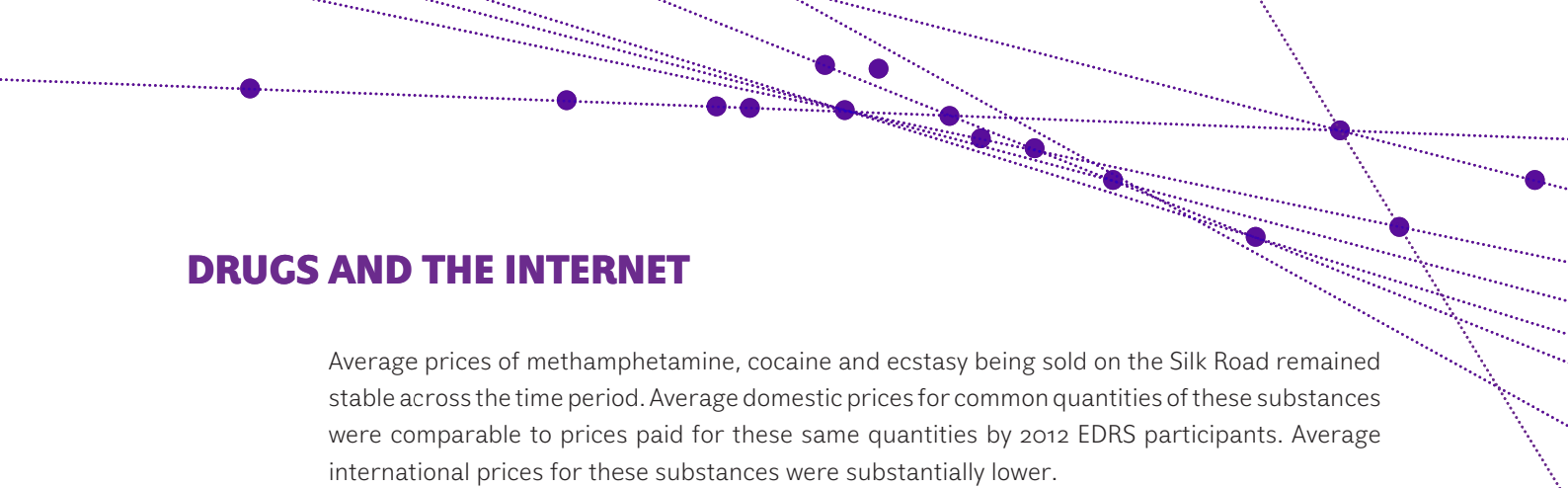
Citation: Sydney: National Drug and Alcohol Research Centre.

To date the availability of illicit drugs in Australia has largely been examined through interviews with people who use drugs (e.g. the Ecstasy and related Drugs Reporting System, EDRS); indicators such as drug seizures and arrests; and analyses of hospital admissions and drug-related deaths. Over the past decade there has been an increasing awareness and interest in online marketplaces as a source for discussion about and purchase of drugs (Walsh, 2011). There are now many internet sites selling substances such as prescription opioids, substances marketed as 'legal' highs (e.g. herbal smoking blends) and substances that have been listed as controlled drugs (e.g. emerging psychoactive substance – EPS – such as mephedrone and synthetic cannabinoids). EPS is a general term used to refer to substances that have similar subjective effects to existing illicit psychoactive substances, and many of these are now listed as controlled drugs (i.e. they are now illicit) in Australia. The advent of the Silk Road in 2011, as an online marketplace, has broadened out the availability of EPS and other more conventional illicit substances (such as cannabis and MDMA).

This bulletin is the first in a new Drug Trends series that provides analysis of trends over time in the availability and type of substances sold via the internet to Australia. The current bulletin reports for the time period September 2012 to February 2013.

Key findings

- The number of retailers on the Silk Road increased (from 282 at time 1 to 374 at the last time point), while the number of retailers on the surface web remained relatively stable (92 at time 1 and 101 at the last time point). The increase on the Silk Road is largely driven by international rather than domestic retailers.
- On the Silk Road, cannabis and EPS were sold by the largest number of retailers consistently across all time points, followed by MDMA (3,4-methylenedioxy-N-methylamphetamine) and pharmaceuticals (primarily benzodiazepines and sildenafil).
- The type of EPS available from surface web retailers differed substantially from the EPS available from those selling on the Silk Road. EPS sold on the Silk Road more closely mirrored those most commonly used by EDRS participants (i.e. people who regularly use psychostimulants) including drugs from the 2C-x and NBOMe categories, followed by DMT (dimethyltryptamine), Mephedrone and Methyldone.



DRUGS AND THE INTERNET

Average prices of methamphetamine, cocaine and ecstasy being sold on the Silk Road remained stable across the time period. Average domestic prices for common quantities of these substances were comparable to prices paid for these same quantities by 2012 EDRS participants. Average international prices for these substances were substantially lower.

METHODS USED IN THIS BULLETIN

'Surface Web' Monitoring

The methodology for monitoring the 'surface web' was adapted from the European Monitoring Centre for Drugs and Drug Addiction outlined in Solberg, Sedefov, and Griffiths (2011). 'Surface web' sites are those that are registered with search engines, and hence can be identified using tools such as Google web searches. Retailers were located by using a generic list of search terms (e.g. "herbal highs", "research chemicals", "legal ecstasy", etc.) on the Metacrawler search engine (<http://www.metacrawler.com>), which combines search results from Google, Yahoo and Yandex.

Once retailers were identified, shipping to Australia was confirmed and the substances on offer were recorded. Searches were conducted monthly from August 2012 until February 2013, between the 15th and the 25th of each month. One search in December 2012 was not conducted due to closure of the research centre. Searches were ceased once saturation point was determined, i.e. when no new retailers were returned within the first 100 search results for each search term. Retailers identified in previous searches were revisited and current activity confirmed, including current availability of substances for sale.

Silk Road Marketplace ('Deep Web') Monitoring

The Silk Road Marketplace operates in a manner similar to established online marketplaces, such as eBay (Barratt, 2012), with the exception that transactions are encrypted and therefore anonymised. The site itself is not directly accessible through internet searching with unmodified browsers. Drugs are purchased on the Silk Road using Bitcoin currency to ensure anonymous transactions (Bitcoin, 2011). The Bitcoin currency is a non-government controlled, anonymous and untraceable currency, used in many online arenas such as internet gaming and retail (Bitcoin, 2011; Hout & Bingham, in press). For a more detailed explanation of Bitcoin currency and the Silk Road, see Christin (2012). Ethical approval was obtained and the Silk Road Marketplace accessed using a dedicated Australian user account.

Substances sold on the Silk Road are available both from domestic retailers within Australia and international retailers. Available substances are placed in nine categories – cannabis, dissociatives, ecstasy, opioids, precursors, prescription, psychedelics, stimulants and 'other'. Each of these categories is then divided into various subcategories including natural and synthetic substances within the broader class, e.g. LSD, magic mushrooms, and various EPS families under the 'psychedelics' category. See Appendix C for a detailed description of the categories and subcategories of substances available on the Silk Road.

The total number of each available substance under each subcategory was recorded as well as the number of unique retailers selling each substance. Each retailer was assigned a unique code based on the time point in which they were first identified and the retailer's country of origin was recorded. Searches were conducted every fortnight from August 2012, with one search in December 2012 not

DRUGS AND THE INTERNET

being conducted due to closures of the research centre. From November 2012 onwards prices in Bitcoin currency were recorded for common quantities of certain substances, both from domestic and international retailers, and prices were converted into Australian dollars (AUD) using the most recent exchange rate listed on Mt. Gox BitCoin exchange website (<https://mtgox.com>).

Price information was collected for the following quantities:

- 1 gram of cocaine;
- 1 gram of MDMA powder/crystal;
- 1 MDMA pill;
- 1 gram of methamphetamine powder; and
- 1 gram of crystal methamphetamine (ice).

RESULTS

Number of Retailers

Surface Web and Silk Road Searches

- Total retailers selling to Australia quantified at each time point for the Silk Road and Surface Web searches are shown in **Figure 1**.
- The number of retailers on the surface web selling to Australia remained stable over the sampling period, ranging from 92 retailers at time 1 to a maximum of 119 at time 2, before decreasing to 101 in the final time point.
- The total number of retailers (both international and domestic) on the Silk Road selling to Australia increased significantly over the time period by 10 retailers at each time point, from 282 retailers in mid-September 2012 to a total of 374 in early February 2013 (representing a 32% increase) (**Figure 1**).

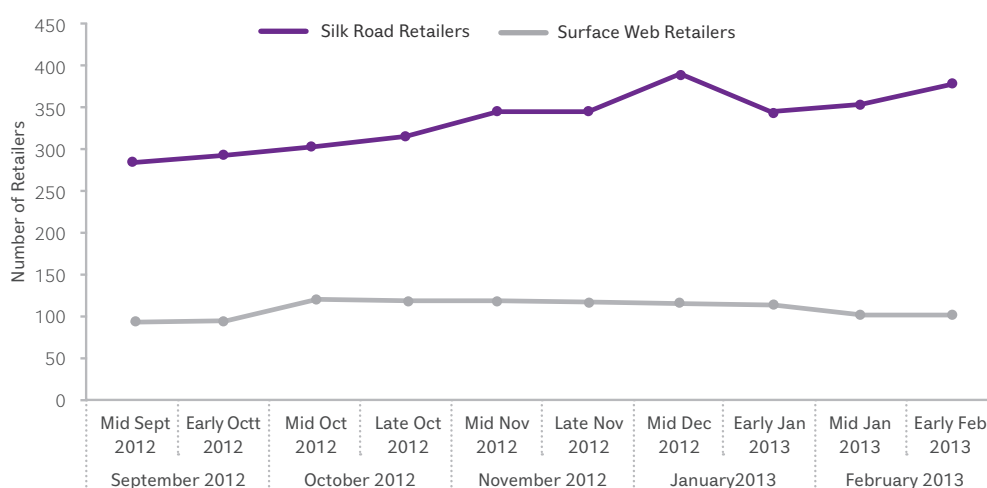


Figure 1: Total number of unique retailers selling to Australia by time point for Silk Road searches and Surface Web searches.

NB: Searches were conducted over the same time period, though surface web searches were conducted monthly and Silk Road searches fortnightly. As such, there are twice as many data points for Silk Road searches.

DRUGS AND THE INTERNET

- The number of domestic retailers on the Silk Road (i.e. based in Australia) also increased significantly by approximately one retailer at each time point, from 36 retailers in mid-September 2012 to 44 in early February 2013 (representing a 22% increase) (**Figure 2**).

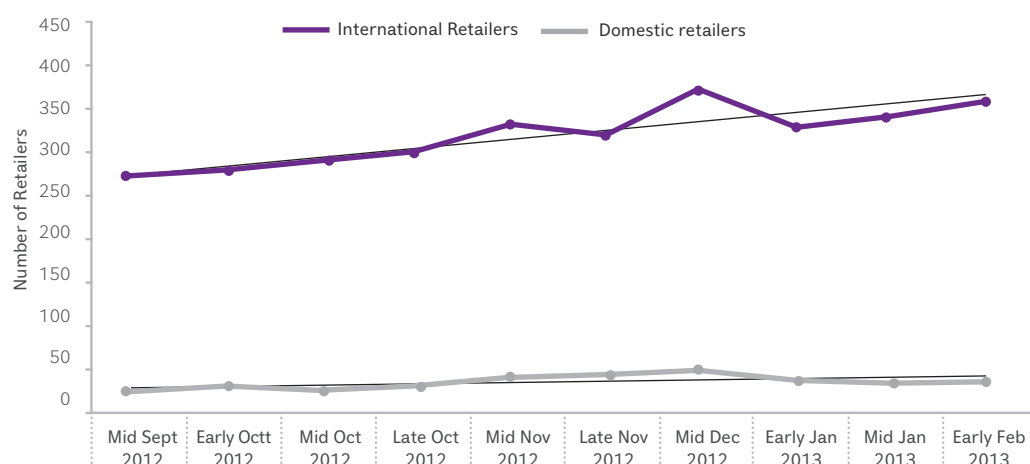


Figure 2: Total number of unique Australian and international retailers on the Silk Road by time point. Linear trendlines are shown in black.

Substances Available to Australia

Surface Web Searches

The most commonly available substances by the retailers quantified on the surface web are detailed in **Table 1**. Many substances available on the surface web were listed by a trade name, with no clear indication of their ingredients, e.g. 'XXX', 'Space Trips' and 'Hummer'. As has been shown in previous research (McGuinness, 2012; Spiller, Ryan, Weston, & Jansen, 2011), the composition of these 'blends' may be altered due to changing legality of the active ingredients while retaining the same trade name. As such, these blends typically have a much shorter shelf life than those sold by their chemical name (Bruno, Poesiat, & Matthews, in press). It was decided to exclude any substances with no clear indication of contents from the analysis. 6-APB (6-(2-aminopropyl)benzofuran) often branded 'Benzo Fury', was the most commonly sold substance across the time period, followed by ethylphenidate and aMT (alpha-Methyltryptamine).

DRUGS AND THE INTERNET

Table 1: Number of retailers selling the ten most common EPS on the surface web by substance type and time point

Substance	September 2012	October 2012	November 2012	January 2013	February 2013	Total
6-APB (Benzo Fury)	23	31	39	31	25	149
Ethylphenidate	21	27	27	25	26	126
aMT	21	29	29	23	21	123
Methiopropamine	14	19	29	28	25	115
MDAI	17	21	19	24	23	104
5-MeO-DALT	19	21	21	20	20	101
Etizolam	17	23	21	20	18	99
AM2201	14	19	21	23	19	96
UR-144	11	14	22	20	18	85
5-APB	14	16	18	19	15	82

NB: Many retailers sold multiple products, and as such these data do not reflect unique retailers. For further information on the above listed EPS, please see Appendix A.

Silk Road Searches

All substances available to Australian users on the Silk Road, and the number of unique retailers selling each substance, are outlined in **Table 2**. Cannabis and EPS were sold by the largest amount of retailers consistently across all time points, followed by MDMA (3,4-methylenedioxy-N-methylamphetamine) and pharmaceuticals (primarily benzodiazepines and sildenafil).

Table 2: Number of retailers on the Silk Road selling each substance type to Australia by time point

Substance	Mid Sept 2012	Early Oct 2012	Mid Oct 2012	Late Oct 2012	Mid Nov 2012	Late Nov 2012	Mid Dec 2012	Early Jan 2013	Mid Jan 2013	Early Feb 2013	Total
Cannabis	68	72	83	83	87	89	102	95	95	99	873
EPS	69	57	73	86	91	80	93	88	93	98	828
MDMA	57	52	66	66	77	81	82	81	78	79	719
Pharmaceuticals	54	47	55	64	71	76	81	77	76	76	677
Cocaine	27	33	30	35	50	43	56	55	47	47	423
Prescription Opioids	38	44	30	37	42	40	50	39	47	47	414
Methamphetamine	26	24	37	37	44	45	41	42	40	55	391
LSD	20	15	25	33	34	29	33	32	41	39	301
Ketamine	15	15	20	24	19	19	23	29	30	36	230
Illicit Opioids	11	16	22	22	24	20	27	27	28	27	224
PIEDs	12	12	22	13	21	21	22	27	29	31	210
Magic Mushrooms	6	6	17	18	18	19	16	16	16	19	151
Synthetic Cannabinoids	11	11	13	13	11	11	11	11	13	14	119
GHB	5	3	7	9	9	7	9	8	8	6	71

NB: EPS = Emerging Psychoactive Substances; PIEDs = Performance and Image Enhancing Drugs. For a further clarification of the categories used in the above table, please see Appendix B.

DRUGS AND THE INTERNET

Table 3 outlines the ten most commonly sold EPS on the Silk Road. The categories 2C-x, NBOMe Family, 5-MeO Family (5-methoxy-substituted) and 4-AcO Family (4-Acetoxy-substituted) were collapsed for clarity as many of these drugs (e.g. 2C-B, 2C-I, 2C-E in the 2C-x category) are sold in the same form, and are advertised as having similar effects. Drugs from the 2C-x and NBOMe categories were the most commonly sold, followed by DMT (dimethyltryptamine), Mephedrone and Methylone (**Table 3**).

Table 3: Number of retailers on the Silk Road selling the ten most common EPS by time point.

Substance	Late Oct 2012	Mid Nov 2012	Late Nov 2012	Mid Dec 2012	Early Jan 2013	Mid Jan 2013	Early Feb 2013	Total
2C-x	25	32	24	31	28	28	34	202
NBOMe Family	29	33	27	29	24	24	29	195
DMT	12	13	9	14	13	17	13	91
Mephedrone	11	14	13	13	13	10	16	90
Methylone	9	12	12	12	13	12	15	85
5-MeO Family	10	12	9	11	12	15	14	83
MDPV	9	10	10	10	9	9	7	64
DOx	9	8	8	7	7	8	10	57
FAs	8	8	8	8	9	3	10	54
4-AcO Family	6	7	5	4	4	3	5	34

NB: Details of specific EPS at each time point were only collected from time point 4 onwards. FAs = Fluroamphetamines. For further information on the above substances and categories, please see Appendix A and B.

Price

Silk Road

From November 2012 onwards, data were collected detailing the median price (in BitCoin currency converted to AUD) of common quantities of illicit substances available on the Silk Road, sold by both domestic and international retailers. Resulting prices are outlined in Figure 3. Prices for these same quantities as reported in the 2012 Ecstasy and related Drugs Reporting System (Sindicich & Burns, 2013) are included for comparison.

DRUGS AND THE INTERNET

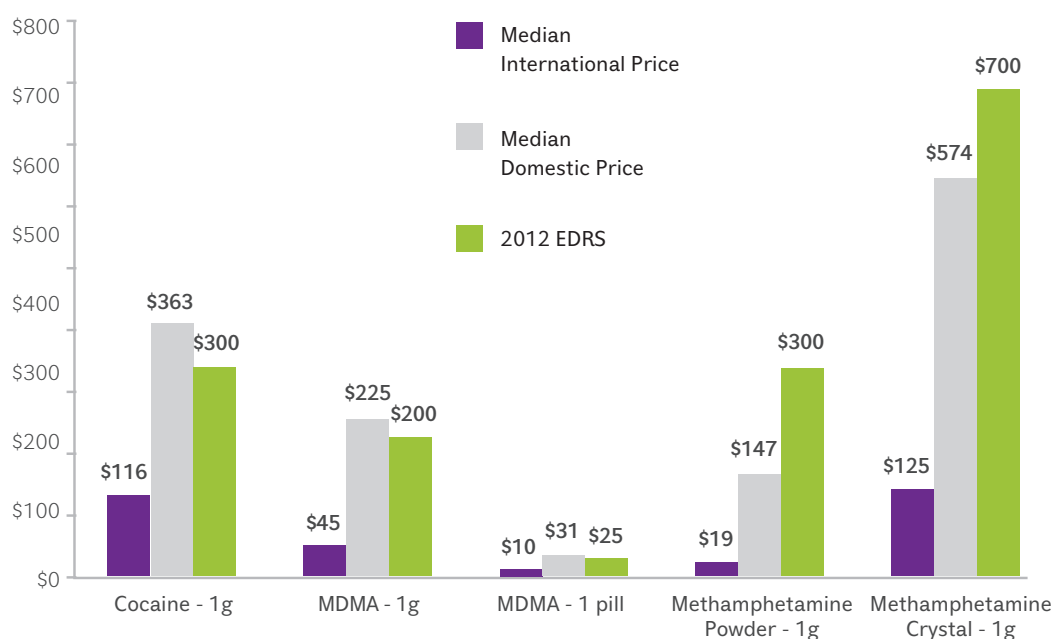
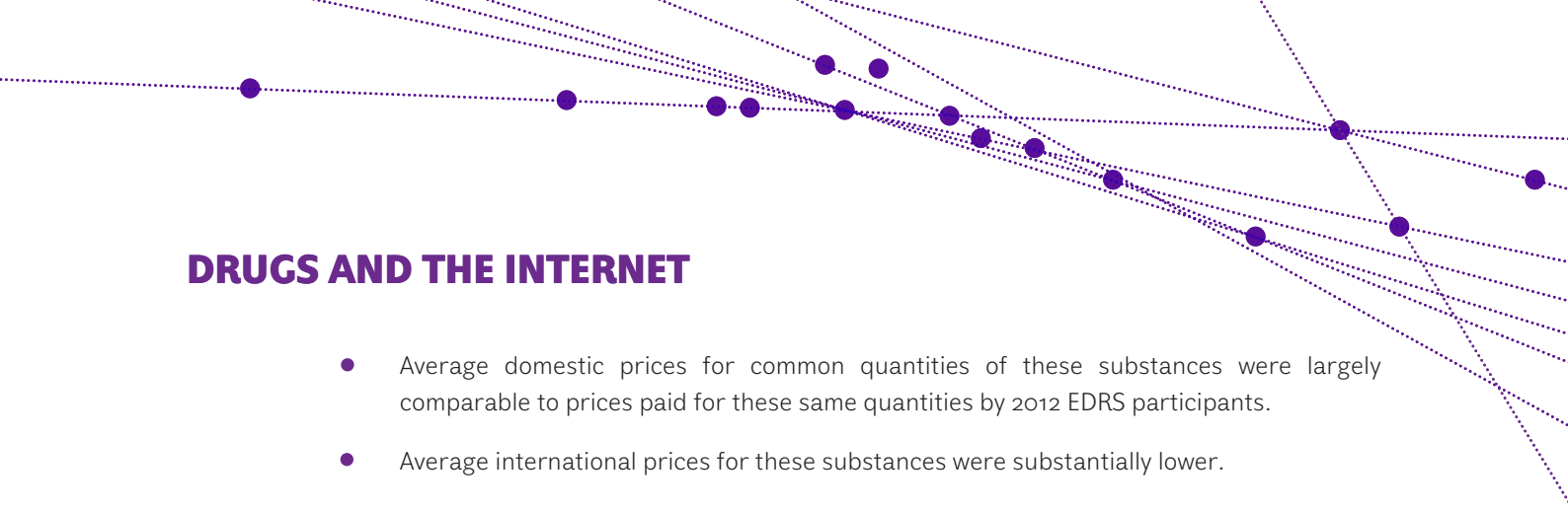


Figure 3: Median price of common quantities of illicit substances on the Silk Road by domestic and international retailers, with 2012 EDRS price data for comparison

As can be seen in **Figure 2**, median prices for common quantities from domestic retailers were comparable to domestic prices recorded in the 2012 EDRS, with the exception of one gram of methamphetamine powder, the price of which was considerably lower on the Silk Road. Prices of these same quantities from international retailers, however, were substantially lower.

Summary

- The number of retailers (both international and domestic) on the Silk Road trended upwards significantly over the sampling period with the total increasing by 10 retailers per fortnight (representing a 32% increase over the entire period). Domestic retailers increased by approximately one per fortnight (representing a 22% increase over the entire period), indicative of a slightly slower increase over time.
- The increase over time in the number of retailers on the Silk Road is primarily being driven by international retailers.
- Over the same time period, the total number of retailers on the surface web remained relatively stable.
- EPS available from surface web retailers differed substantially from the EPS available from Silk Road retailers.
- EPS sold on the Silk Road more closely mirrored the most commonly used EPS reported by 2012 EDRS participants (i.e. DMT, 2C-B, methylone, mephedrone and MDPV).
- Average prices (both international and domestic) of methamphetamine, cocaine and ecstasy being sold on the Silk Road remained stable across the time period.



DRUGS AND THE INTERNET

- Average domestic prices for common quantities of these substances were largely comparable to prices paid for these same quantities by 2012 EDRS participants.
- Average international prices for these substances were substantially lower.
- It is not possible from these results to determine how often, and in what amounts, illicit and emerging substances are being purchased online in Australia. Currently, there is no such data available for Australia. However, current indicators such as the EDRS indicate low usage of the internet for purchasing drugs among existing ecstasy consumers, with only 3% of participants indicating that they had used the internet for their last purchase of any substance, compared with 60% indicating that their last purchase of any substance was from a dealer and 58% indicated that their last purchase was from a friend (Sindicich & Burns, 2013).

Implications

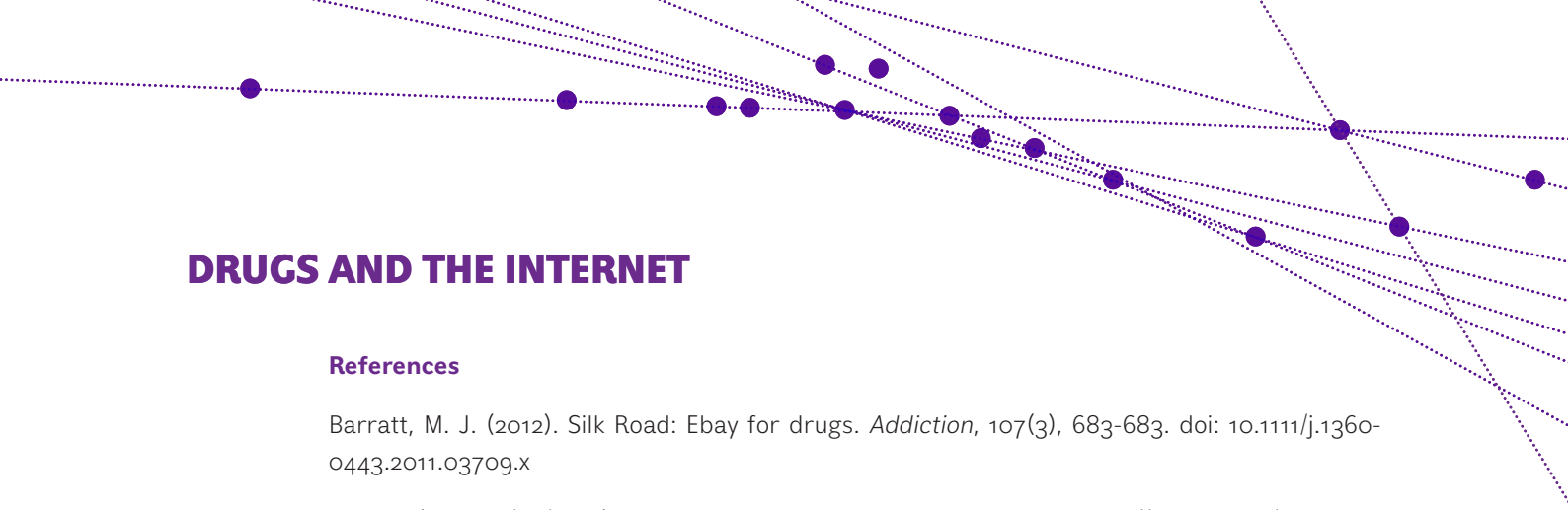
The EPS most commonly sold by surface web retailers are largely legal, or at least marketed as such, in the countries of origin of these retailers, despite being illegal in Australia under recent legislature changes (that ban substances purporting to have similar effects to already controlled substances). The EPS available on the Silk Road, however, are mostly illegal in Europe and North America, which may account for their absence from surface web retailers.

The ready availability of ecstasy on the Silk Road has the potential to impact on local ecstasy markets in Australia, which appear to have been in decline in recent years (Scott & Burns, 2011). Although substances sold on the Silk Road by international retailers were considerably lower in price than those sold domestically, this is offset by the increased risk of detection through international importation.

The increase in total retailers seen over the sampling period appears to be largely driven by an increase in international retailers, with the total number of Australian retailers increasing at a slower rate. This suggests a slower uptake in usage of the Silk Road by Australian retailers compared to the international market. Recent data from the 2012 EDRS indicate that only 2.6% of participants had purchased drugs online during their last purchase, indicative that online purchases among this group are not common (Sindicich & Burns, 2013).

While non-specific 'blends', without specified ingredients, were not included in search criteria for surface web retailers, previous Australian research suggests that these blends make up a large proportion of the online market among surface web retailers (Bruno et al., in press). The large number of retailers selling these blends may pose a significant risk for users. To date, media reports of harms in Australia have been associated with the use of 'blends', rather than chemically specific substances (e.g. <http://www.smh.com.au/nsw/naked-and-psychotic-legal-cocaine-substitute-offers-a-deadly-high-20121102-28phr.html>). Adequate monitoring of these blends may require more intensive monitoring methodologies – such as regular controlled purchasing of these substances from both online and physical stores as well as regular testing for their ingredients.

Given the potential for the Internet to influence the nature of illicit drug markets in Australia continued monitoring of its usage is critical. This bulletin represents the first in a new series reporting on work by the Drug Trend programs at NDARC addressing the role of the Internet in illicit drug use. Further bulletins will build on work in this important area.



DRUGS AND THE INTERNET

References

- Barratt, M. J. (2012). Silk Road: Ebay for drugs. *Addiction*, 107(3), 683-683. doi: 10.1111/j.1360-0443.2011.03709.x
- Bitcoin. (2011, 14/03/2013). Bitcoin. Bitcoin P2P digital currency, from <http://bitcoin.org/>
- Bruno, R., Poesiat, R., & Matthews, A. J. (in press). Internet monitoring for EPS. *Drug and Alcohol Review*.
- Christin, N. (2012). Traveling the Silk Road: A measurement analysis of a large anonymous online marketplace.
- Hout, M. C. V., & Bingham, T. (in press). 'Silk Road', the virtual drug marketplace: A single case study of user experiences. *International Journal of Drug Policy*(o). doi: <http://dx.doi.org/10.1016/j.drugpo.2013.01.005>
- McGuinness, T. (2012). Bath salts: They are not what you think. *Journal of Psychosocial Nursing*, 50(2), 17-21.
- Scott, L. A., & Burns, L. (2011). Has ecstasy peaked? A look at the Australian ecstasy market over the past eight years. *EDRS Drug Trends Bulletin*, April 2011. Sydney: National Drug and Alcohol Research Centre, University of New South Wales.
- Sindicich, N., & Burns, L. (2013). Australian Trends in Ecstasy and related Drug Markets 2012. Findings from the Ecstasy and Related Drugs Reporting System (EDRS). *Australian Drug Trend Series No. 100*. Sydney: National Drug and Alcohol Research Centre, University of New South Wales.
- Solberg, U., Sedefov, R., & Griffiths, P. (2011). Developing a sound methodology to monitor the online availability of 'new drugs/legal highs'. In J. Fountain, V. Asmussen Frank & D. J. Korf (Eds.), *Markey, methods and messages - Dynamics in European drug research*. Germany: Pabst Science Publishers.
- Spiller, H. A., Ryan, M. L., Weston, R. G., & Jansen, J. (2011). Clinical experience with and analytical confirmation of "bath salts" and "legal highs" (synthetic cathinones) in the United States. *Clinical Toxicology*, 49(6), 499-505. doi: doi:10.3109/15563650.2011.590812
- Walsh, C. (2011). Drugs, the Internet and change. *Journal of Psychoactive Drugs*, 43(1), 55-63. doi: 10.1080/02791072.2011.566501

DRUGS AND THE INTERNET

Appendix A: Chemical classification of mentioned EPS

EPS	Category	Subcategory
2C-x	Phenethylamine	Psychedelic
4-AcO Family	Tryptamine	4'-Substituted
5-APB	Phenethylamine	Amphetamine Based
5-MeO-DALT	Tryptamine	5'-Substituted
6-APB	Phenethylamine	Amphetamine Based
AM2201	Synthetic Cannabinoid	Cannabinoid Agonist
aMT	Tryptamine	General Tryptamine
DMT	Tryptamine	General Tryptamine
DOx	Phenethylamine	Psychedelic Amphetamine
Ethylphenidate	Other Stimulant	Norepinephrine-dopamine reuptake inhibitor
Etizolam	Benzodiazepine Analogue	Benzodiazepine Analogue
FAs	Phenethylamine	Amphetamine Based
MDAI	Phenethylamine	Cyclized Amphetamines
Mephedrone	Phenethylamine	Substituted Cathinone
Methiopropamine	Other Stimulant	Amphetamine Based
Methylone	Phenethylamine	Substituted Cathinone
NBOMe Family	Phenethylamine	Psychedelic
UR-144	Synthetic Cannabinoid	Cannabinoid Agonist

Appendix B: Glossary of categories and abbreviations used in bulletin

Category	Commonly Available Examples
2C-x	2C-B, 2C-E, 2C-I
4-AcO Family	4-AcO-DMT, 4-AcO-DET, 4-AcO-MIPT
5-MeO Family	5-MeO-DMT, 5-MeO-DIPT
Cannabis	Marijuana, hash, edibles (THC infused foods)
DOx	DOI, DOM, DOC
FAs	2-FA, 3-FA, 4-FA
Illicit Opioids	Heroin, Opium
MDMA	MDMA powder, 'Ecstasy' pills
Methamphetamine	Powder (Speed), crystal (Ice)
NBOMe Family	25B-NBOMe, 25I-NBOMe, 25C-NBOMe
Pharmaceuticals	Benzodiazepines, Sildenafil (Viagra)
PIEDs	Clenbuterol, Nordicor, Biogen
Prescription Opioids	Codeine, Morphine, Tramadol, Methadone
Synthetic Cannabinoids	JWH Family, AM2201, UR144

DRUGS AND THE INTERNET

Appendix C: Categories of substances available on the Silk Road

Cannabis

- Hash
- Clones
- Concentrates
- Edibles
- Oils
- Seeds
- Synthetic
- Topicals
- Weed

Dissociatives

- DXM
- Ketamine
- MXE
- PCP

Ecstasy

- 5-APB
- 4-MEC
- Butylone
- MDA
- MDAI
- MDMA
- Methylone
- MPA
- Pills

Opioids

- Heroin
- Opium
- Prescription

Prescription

- Benzos
- Other
- Pain Relief
- Steroids, PEDs
- Stimulants
- Viagra

Psychedelics

- 2C Family
- 4-AcO-DET
- 4-AcO-DMT
- 4-HO family
- 5-MeO-DALT
- 5-MeO-DiPT
- 5-MeO-DMT
- 5-MEO-MIPT
- AMT
- DMT
- DOx
- Ibogain
- LSA
- LSD
- Mescaline
- NBOMe
- Salvia
- Shrooms
- TMA Family

Stimulants

- Cocaine
- 4-MEC
- 6-APB
- A-PVP
- Caffeine
- Crack
- Ephedrine
- Ethylphenidate
- FAs
- FMAs
- FMCs
- MDPPP
- MDPV
- Mephedrone
- Meth
- Pentedrone
- Prescription
- Speed

Other

- Barbiturates
- Entheogens
- Inhalants
- Intoxicants
- Nootropics
- SSRIs
- Supplements
- Tobacco

THE NATIONAL DRUG AND ALCOHOL RESEARCH CENTRE

University of New South Wales, Sydney NSW 2052

Phone: +61 2 9385 0333 Fax: +61 2 9385 0222

ISSN 2202-6207