



European Monitoring Centre
for Drugs and Drug Addiction

The Internet and drug markets

Summary of results from an EMCDDA Trendspotter study

Acknowledgements

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Rationale and methods

This EMCDDA Trendspotter study on Internet drug markets in Europe was undertaken during September and October 2014. It commenced with a phase of data collection and literature review, culminating in an expert meeting in Lisbon on 30–31 October 2014. The aim of the study was to increase understanding of the online supply of drugs and undertake a mapping of the range of Internet drug markets in existence. Specific focuses were on the role of social media and apps; online sale of new psychoactive substances (NPS); online sales of medicinal products for illicit use; and the sale of drugs on the deep web.

Fourteen international experts attended the meeting, sharing their experiences and contributing to an analysis of the topic, providing insights from IT, research and monitoring, law enforcement, and Internet and drug user perspectives. The Trendspotter study methodology incorporates a number of different investigative approaches and data collection from multiple sources. This study included a review of the international literature; 15 expert presentations (one by video); and three facilitated working groups. Analysis was based on triangulation of the available data, with a view to providing as complete and verified a picture as possible.

Social media and drug markets

Social media are 'Web 2.0 technologies', characterised by increased participation and multidirectional lines of communication. The world of social media is developing rapidly: Facebook has more than 1.6 billion registered users, YouTube has more than 1 billion active users and Twitter has more than 500 million registered users. They operate largely on the surface web, although Facebook, for example, has recently established its services through Tor as well. Social media may have an active role in drug markets, with sites and apps being used for buying and selling drugs, or they may have a more indirect role — utilising various forms of 'marketing': experience sharing, photo and video sharing, opinion forming, etc.

It is perhaps more accurate to talk about virtual social networks (VSN) than online social networks, as much communication takes place using smart phones and tablets. VSN can be classified as either static networks, which are more permanent and may include user profiles and terms of use (e.g. Facebook), or dynamic networks (e.g. Skype or ooVoo video chat), which are temporary and often by invitation only. VSN can also be categorised in relation to their approaches to drug use, ranging from prohibitive to tolerant to promoting. A feature of VSN is the creative use of slang and argot to get around moderation. Static (and especially) dynamic VSN that utilise webcams have recently been associated with 'chem sex' parties and/or 'slamming' among gay men and men-who-have-sex-with-men (MSM). 'Chem sex' refers to sex while on various drugs, including mephedrone, methamphetamine, cocaine, etc.; 'slamming' is often used by gay men and MSM to refer to the injection of these and other drugs.

Another new development relates to drug supply and the sharing of drugs or drug experiences using smartphone apps. Examples include Grindr and Scruff, GPS location-based dating services used mainly by gay men and MSM. Bindhim et al. (2014) monitored Google Play and App Store over a three-month period and recorded growth in 'apps that promote illicit drug use'. The majority of these apps were about cannabis (98 %). For example, an app entitled 'How to sell weed' provided instructions for production and selling. 'Leafy App' offers an interactive catalogue of different varieties of cannabis, their characteristics and availability (including a search for the nearest source based on GPS location). Cavazos-Rehg et al. (2014) looked at 'Characterizing the Followers and Tweets of a Marijuana-Focused Twitter Handle.' They analysed a pro-cannabis Twitter handle with around 1 million followers, most of them young males.

A number of sources confirm that law enforcement monitoring of social media in relation to drugs does occur, but the volume of the content is to a large extent prohibitive. Media reports of arrests resulting from such monitoring usually refer to the cases of young people found with small amounts of an illicit drug and having little other criminal involvement. Most media reports of such police activity relate to the sale of prescription drugs rather than illicit drugs.

Legal highs, research chemicals, trade sites

The use of the surface web for the sale of NPS is a topic that has received increasing attention over the last decade. In 2013, EMCDDA online monitoring identified 651 websites selling 'legal highs' to Europeans. During 2014, the EMCDDA undertook a number of targeted Internet snapshots to gain an understanding of the supply of NPS and inform the risk assessment of, for example, 4,4'-DMAR and MT-45. New methods for automated monitoring of this arena are being developed by the I-TREND project led by the French Monitoring Centre for Drugs and Drug Addiction (OFDT), with partners in the Czech Republic, the United Kingdom, Poland and the Netherlands. I-TREND built on a 2011 study which categorised the online NPS market into four primary segments: shops selling NPS as research chemicals, mostly under their chemical names; a commercial segment, with products sold under brand names; classified ads, often located within public websites; and a deep web segment (Lahaie et al., 2013). A breakdown of more than 1 000 active sites identified as selling to the five I-TREND countries included unique shops with unique design and IP addresses, as well as domain redirects to shops, and parallel web pages with the same design and/or IP address. At least 18 % of the online shops were somehow connected with another one (or duplicated). Recent developments identified in the online NPS market included both an increased hybridisation between commercial and research chemical segments, and rapid growth of NPS sales on the deep web. This hybridisation is resulting in a 'grey market' where, for example, some websites have simultaneously a surface web presence and a hidden element on the deep web. For example, an online shop might be referenced by search engines as selling NPS, but its catalogue will be accessible only if the client is co-opted by a previous customer.

Online sales of medicines and illicit supply

The online sale of medicines, which took off in the early 2000s, initially focused on lifestyle products (e.g. erectile dysfunction medicines such as Viagra®, slimming tablets, hair-restorers and smoking cessation products). More recently, the market has shifted towards performance enhancement products; controlled prescription drugs, including opioid painkillers, benzodiazepines, antidepressants and antibiotics (Orizio et al., 2011); and 'life-saving' medicines. A US study classified online pharmacies as either legitimate or illegitimate. Legitimate websites comply with national and international regulations and standards, thus guaranteeing the quality of the product, selling controlled medicines only with a valid medical prescription and ultimately assuring consumer safety. Reports suggest that the vast majority of online pharmacies fall into the illegitimate category. These are not registered with any recognised accreditation system and do not abide by regulations and professional standards. A growing concern related to illegitimate online pharmacies is their potential role as a source of drugs of misuse. However, the limited studies in this area indicate that online pharmacies are unlikely to be a reliable source of supply for the illicit drug market. In addition, there are suggestions that the growing expansion of cryptomarkets on the deep web may prove a more reliable and less expensive alternative.

A related issue is increasing online sales of food and dietary supplements such as Phenibut (β -phenyl- γ -aminobutyric acid), which is an authorised medicine in Russia, used since the 1960s for treating anxiety, alcohol withdrawal, OCD, stammering and insomnia. Phenibut is not licensed as a medicine in Europe or approved as a pharmaceutical in the US, but is sold as a dietary supplement

online (eBay, Amazon), aimed at the general population and marketed as a natural product: 'an amino acid related to GABA', which 'improves mood, induces relaxation, enhances sexual desire'. Side effects include dependence and withdrawal symptoms.

Within the EU, five Member States allow online sales of prescription drugs, and the focus is on regulating the supply not regulating pharmacies. In the UK, there is currently a voluntary logo scheme for registered pharmacies that trade online, but from July 2015 a mandatory logo scheme for the legal supply of medicines 'at a distance' will be introduced across the EU.

The global law enforcement operation Pangea has been active in making seizures of illegally traded medicines. The results of Pangea VII included seizures: 1 855 884 doses were seized at all mail hubs, including 30 498 doses of suspected counterfeit/falsified medicines. A wide range of medicines were seized, including painkillers, antibiotics, anti-depressants, anti-anxiety medication, weight loss products and medicines to treat acne, narcolepsy, erectile dysfunction, asthma, diabetes and epilepsy.

Anonymous online drug marketplaces

The *deep web* is defined as a part of the Internet not accessible to traditional search engines such as Google, and the *dark web* may be defined as a small portion of the deep web that has been intentionally hidden and is inaccessible through standard web browsers. In recent years, the development of tools such as Tor has made it possible for anybody to browse the Internet anonymously, and several anonymous online markets, specialised in areas such as pornography, weapons or narcotics, have emerged. On the deep web, drug sales can take place in a marketplace (such as Silk Road), within a decentralised network or between individuals. However, it is drug cryptomarkets that have received the most attention.

The anonymous online drug marketplace Silk Road began operating in February 2011. Silk Road was not the only drug cryptomarket. Martin found more than 20 different cryptomarkets offering a range of illicit goods and services (Martin, 2014). Although Silk Road had at one stage been the largest, it was surpassed by both Agora and Evolution in early 2014. While offering anonymity, Silk Road provided the infrastructure for sellers and buyers to conduct transactions in an online environment, similarly to other online marketplaces such as eBay, with professional dispute resolution mechanisms, use of vendor and buyer ratings, hosting of member discussion forums, etc. While a wide variety of products were advertised on Silk Road, traditional street drugs and some prescription medicines were reported to be most popular. In the US, the UK and Australia, MDMA was the most commonly purchased drug on Silk Road (Barratt et al., 2014), followed by cannabis and LSD. Sale of NPS on the dark web seems to be limited. Looking at the revenue generated by large versus small quantity listings, bulk discounts and terminologies used, Aldridge and Decary-Hetu (2014) argued that a substantial proportion of transactions on Silk Road were best characterised as 'business to business', with many users making purchases for resale.

Silk Road kept its operators anonymous and its location secret by combining two technologies: Tor and bitcoin. While use of Tor meant that the Silk Road website did not know where the buyer or vendor was located (because IP addresses were clouded), bitcoin was used to facilitate anonymous transactions. Silk Road supported bitcoin as a trading currency. Instead of paying the seller directly, buyers placed the corresponding amount in escrow with Silk Road and payments were released to vendors only when the item reached its destination and the delivery was confirmed. In reality, cryptocurrencies such as bitcoin are not anonymous (as there is a central ledger) and they need to be laundered, for example using a service such as Bitcoin Fog. Anonymising bitcoin is a new trend. An important feature of Silk Road was that both sellers and buyers received ratings, with trust built on reputation. This system was weakened by various scams.

User perspective

The main reasons given by users for buying drugs on Silk Road were 'a wider range of drugs', 'better quality', 'more convenient to order online' and 'more comfortable buying from sellers with high ratings' (Barratt et al. 2014). In addition, the site's anonymity, its member forums and its transaction system with speedy delivery were cited as benefits. Silk Road buyers also referred to poor drug quality in their locality and fear for personal safety when buying drugs on the streets (Van Hout and Bingham, 2013). Common reasons for not purchasing drugs on Silk Road included 'having adequate access to drugs through own networks' and 'fear of being caught by police/customs if drugs are sent'; furthermore, the process of accessing the site using the Tor browser, arranging credit and purchasing products was time consuming and relatively difficult.

Competition with street markets

There seems to be a consensus that while the overall proportion of illicit drugs currently channelled through cryptomarkets is comparatively small, this will not necessarily remain the case for long. Silk Road has been described as a paradigm-shifting, transformative criminal innovation, as it provides drug dealers with (1) a worldwide market for their products; (2) the capacity to sell to customers not already known to them; (3) the ability to trade anonymously; and (4) the opportunity to trade in a relatively low-risk environment (Aldridge and Decary-Hetu, 2014).

Online marketplaces may also offer the benefit of increased personal safety (for buyer and seller) and reduce the possibility of violence, as buyers and sellers never reveal their identities and never meet face to face. Improved product quality (purity, price, type of product) and reduced risk of detection have been cited as perceived advantages in studies. Some challenging questions were posed; for example, are online drug markets better for public health and safety than street markets, with reduced levels of violent crime? Are they better for individual health, with higher quality drugs?

Recent developments

On 3 October 2013, the FBI shut down the original Silk Road and arrested its alleged founder, known as 'Dread Pirate Roberts'. A new version of the Silk Road (Silk Road 2.0) was launched on 6 November and, while no scientific studies have been published yet on the functioning of Silk Road 2.0, blogs and online articles seem to indicate that, despite problems with stolen bitcoins early in 2014, Silk Road 2.0 flourished. On 6 November 2014 Interpol announced the closing down of 400 deep websites, including Silk Road 2.0. Other websites have been closing down since, supposedly trying to evade arrest and taking the bitcoin money stored in their accounts (www.deepdotweb.com/2013/10/28/updated-list-of-hidden-marketplaces-tor-i2p/).

Harm reduction interventions

A number of studies suggest that Silk Road provided users with ways to reduce the harm caused by illicit drug use, particularly compared with street-based drug marketplaces. Examples included the sale of high-quality products with low risk for contamination, vendor-tested products, trip reporting and online discussion on harm reduction, with resources for people who wished to reduce their consumption (Barratt et al., 2014; Van Hout and Bingham, 2013). There is growing interest in the potential for offering harm reduction interventions directly to users of the deep web, and Doctor X (www.elsubmarinodolactorx.com) has been providing services to Silk Road users, including information, advice and drug-testing services.

Trafficking and supply reduction challenges

An important question is whether or not the Internet provides new criminal opportunities for drug trafficking. A recent analysis indicates that drug trafficking over the Internet can be categorised into two distinct flows, one for synthetic drugs and NPS, another for traditional illicit drugs. It is recognised that there remains a physical component to Internet trafficking activities, primarily at the cultivation/production stage and at the distribution stage (e.g. postal systems are involved). Compared with non-Internet trafficking, there seem to be reduced activities or layers in the chain for production aspects and increased stages for distribution. There has been more online activity in the area of trafficking NPS and synthetics, taking advantage of the possibility of managing the process from the destination country. Criminals are exploiting legal loopholes, for example taking advantage of differences in national regulation. Postal systems are seen as the major bottleneck in the system, as the goods still need to be delivered through the (inter)national mail system.

For law enforcement agencies, online monitoring is a new approach and they are building experience. Law enforcement strategies are focused on market disruption; this includes reducing the trust around anonymity, as well as the identification, arrest and prosecution of sellers in cryptomarkets. Practically, law enforcement agencies may engage in covert operations, infiltrating online markets, establishing an agent as a trustworthy buyer and perhaps arranging a face-to-face meeting. More overt tactics involve making other users of online marketplaces aware of police presence and ensuring that the takedown of markets receives media attention. At the EU level, strategy includes the Illegal Trade on Online Marketplaces (ITOM) project, which set up an EU cybercrime network to establish effective ways of combating illegal trading on online marketplaces.

Discussion and analysis

Rapid changes in technology such as development of easy online payment systems are transforming how we interact both commercially and socially across the board. Web 2.0 technologies are expanding their reach, and while they currently appear to primarily involve small-scale sellers/buyers/sharers of drugs, occurrences of offers to buy and discussion of buying and using drugs are numerous.

The online sale of counterfeit medicines is clearly a major global enterprise; however, at present, evidence of sourcing for the illicit drug market from online sources is slim. Nevertheless, it is an area likely to require further monitoring. Information on online sales of NPS and research chemicals is steadily emerging, with some evidence of overlap with illicit markets, through so-called grey marketplaces. Much of the evidence identified in this study has focused on the functioning of drug marketplaces on the deep web and, with reports of exponential growth in both markets and sales, these have been identified as an important area for future monitoring.

It is interesting to note that, while Internet markets have global reach, national characteristics still have a significant impact. Many buyers prefer sellers from their home country, perceiving less risk with fewer borders to cross. A new Finnish marketplace was established on the deep web after Silk Road closed, specifically to cater to Finnish users who might not want to buy from abroad. Similarly, it appeared that most US and Australian vendors were not willing to ship drugs across international borders, and Australian buyers prefer local sellers. Furthermore, there appears to be interaction with existing domestic drug markets and consumer preferences; for example, I-TREND noticed product choices that were linked with country and cultural preferences. In addition, there are some global trends expressed within local subcultures that have both commonalities and differences (e.g. slamming, psychonauts).

Drivers of change

A wide range of factors were identified as drivers of change in terms of the Internet and drug markets:

- technology, globalisation and market innovation;
- secure encryption and web hosting (Tor, PGP, etc.);
- new marketplaces, both hidden and public;
- innovation, including decentralised sites, argot, apps, exploiting the learning from conventional Internet sites;
- online communities of likeminded people, online activism;
- market economics — competitive advantages and disadvantages;
- law enforcement and regulation, e.g. closing of bricks-and-mortar legal high shops may have led to increased Internet sales.

Threats, opportunities, challenges

A range of potential threats and opportunities were identified, both for market players themselves and for those trying to restrict their development.

- Global demographics are changing rapidly, and increasing market opportunities are likely to exist in developing countries with weak jurisdiction and growing computer literacy.
- The involvement of organised crime in online drug markets is unclear at present; however, if online drug trading offers significant threats or opportunities, organised criminals will undoubtedly become a presence.
- In addition to supporting markets, both the surface web and the deep web offer new ways to access help, and potentially to reduce barriers to help seeking. This could build on the strong online tradition for community involvement.
- A range of new methodological issues arise with regard to researching the web. In some respects, this opens up a golden age for ethnographic research, accompanied by innovative developments in online research methodologies (e.g. netnography, infodemiology, etc.). It also requires new ethical considerations.

New trends

A number of significant new trends were identified in the fast-changing Internet drug markets. These include:

- criminal innovation with a new breed of entrepreneurial drug dealer ('disorganised' crime);
- a tendency towards decentralisation of market structures and activities;
- a move downwards, from developments in surface (via grey?) to deep websites;
- a move to more covert communication and sophisticated encryption;
- growth in multi-key escrow and rating systems;
- increasing availability of high-potency products in online markets;
- growth in sex drugs apps, especially in the MSM dating scene;
- growth in drug advertising and exchange on social media;
- Increased uncertainty in the deep web community as a result of the latest police interventions and of scams.

Conclusion

The Internet facilitates movement of products, money and information across global borders. It also allows the movement of drugs, medicines, NPS, precursors and information on production techniques. Social media play a role in facilitating interaction, advertising and marketing drugs, in addition to providing sales forums, shop access via apps and classified ads. The dividing line between surface websites, for example selling so-called legal highs, and cryptomarkets operating on the deep web seems to be increasingly blurred, as one level can increasingly provide access to another. At present, the extent of Internet-enabled drug transactions taking place on the deep web is very limited; however, growth has been exponential and there is no evidence to suggest these markets will remain restricted for long. The ongoing cat-and-mouse game between law enforcement and Internet vendors is noted. It appears that buyers and sellers adapt rather easily to cryptomarket takedowns, in a similar way to buyers and sellers using surface web stores: when one shop closes, others quickly appear to replace them. Undoubtedly, the speed with which the Internet allows transformation to occur in drug markets poses a major challenge across the board, to law enforcement and public health, as well as to research and monitoring agencies.

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Glossary

The **surface web** or **clear web** is the Internet that can be found by link-crawling techniques used by a typical search engine such as Google, Bing or Yahoo.

The **deep web** is a part of the Internet not accessible to these search engines; the only way to access the deep web is by conducting a search within a particular website (for example, government databases and libraries contain huge amounts of deep web data).

The **dark web** may be defined as a small portion of the deep web that has been intentionally hidden and is inaccessible through standard web browsers. This is the portion of the Internet most widely known for illicit activities, because of the anonymity associated with this network.

Cryptomarkets are located in the dark web and accessed using Tor. A cryptomarket can be defined as an online forum where goods and services are exchanged between parties who use digital encryption to conceal their identities. It is not necessarily a site for the commission of cybercrime, as legal exchanges may also be conducted in such a forum (Martin, 2014: 356).

Tor is an acronym for The Onion Router. Anonymisation services such as Tor hide a computer's IP address when accessing the site. Tor is a 'circuit-based low-latency anonymous communication service' developed in collaboration with US military intelligence and launched in 2004. Tor is a free encrypting software for enabling online anonymity, protecting the personal privacy of the Internet user and resisting censorship, and it has many societal benefits. However, as it makes it more difficult for Internet activity to be traced back to the user, Tor is also used for illegal matters.

Silk Road was a cryptomarket that operated as a Tor-hidden service and used bitcoin as its currency. Silk Road was an archetypical cryptomarket, being the most well known and remaining the largest for a long period.

Pretty Good Privacy (PGP) is a data encryption and decryption computer program that provides cryptographic privacy and authentication for data communication. PGP is often used for signing, encrypting and decrypting texts, emails, files, directories and whole disk partitions, and to increase the security of email communications.

A **Twitter handle** is a username selected by anyone using Twitter; it must contain fewer than 15 characters. Each Twitter handle has a unique URL, with the handle added after twitter.com (e.g. <http://twitter.com/username>).