FEDERAL RESEARCH PROGRAMME ON DRUGS

SUMMARY

CRYPTODRUG

From the alley to the web.

The rise of illicit drug trade on cryptomarkets and the involvement of Belgian buyers and vendors

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SUMMARY

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1. Background

Developments in technology may not only transform aspects of our daily life, but they may also impact the way in how illicit transactions are organised, such as illicit drug supply and demand. Instead of face to face drug trading interactions between two parties, these parties could also meet online, on the internet.

Although the trade of illicit drugs on the internet has only fairly recent come to the attention of academics and the general public (Martin, 2014), the online transaction of drugs is not new. The first transaction, involving cannabis, is assumed to have taken place in the 1970's (EMCDDA, 2017).

Talking about online drug transactions, we should roughly make a distinction between transactions on the visible clearnet and those on the hidden dark web. CRYPTODRUG focuses on illicit drug transaction on the dark web, an openly accessible, yet highly encrypted small part of the deep web. A dark web market place, in this report referred to as a 'cryptomarket', could be defined as an ''*online forum where goods and services are exchanged between parties who use digital encryption to conceal their identities*" (Martin, 2014, p. 356).

Indeed, cryptomarkets provide relative anonymity because of the required special network routing protocol on The Onion Router (Tor) network concealing amongst others the location of the website server and user identifiers like IP addresses, the use of automatic encryption of all communications through Pretty Good Privacy (PGP) cryptography and the payments with digital currencies such as Bitcoin or Monero (Roxburgh et al., 2017; Paquet-Clouston et al., 2018).

These cryptomarkets have grown rapidly since 2011, when one of the most popular drug cryptomarkets, Silk Road 1.0, was launched. Silk Road 1.0 was operational for more than two years and most listings concerned illicit drugs, besides pornographic material or false documents such as fake ID cards (EMCDDA, 2017). Today, there is no readily available exhaustive list (or a method to compile one) of the total amount of currently functioning cryptomarkets. Early May 2019, the widely used DeepDotWeb referred to 19 active cryptomarkets (DeepDotWeb, 2019). Just like Silk Road 1.0 most of these markets offer a wide range of (mainly illicit) products and services, but illicit drugs make up the large majority of products available (EMCDDA, 2017).

Cryptomarkets are dynamic and adaptive markets. While the majority of these markets do not last more than one year (EMCDDA, 2017), some dominate(d) the dark web for two years or longer, such as the aforementioned Silk Road 1.0 (founded in 2011 and ceased operations in 2013) or Dream Market (founded in 2013, ceased operations in 2019) (Dark web Stats, June 2018; ZDNet, March 2019). Once a leading cryptomarket closes (due to for example law enforcement interventions or exit scams), many of its users will migrate to remaining cryptomarkets or new cryptomarkets will emerge shortly afterwards. To illustrate this: when Silk Road 1.0 was shut down in October 2013, Silk Road 2.0 came online in November 2013, run by former administrators of Silk Road 1.0.

The existence of cryptomarkets offer an unprecedented opportunity to study a drug market in its totality and to monitor new trends in drug availability and use (Barratt & Aldridge, 2016; Rhumorbarbe et al., 2016). Since a couple of years, drug cryptomarkets have gained considerable

interest from researchers, producing data on the profile of consumers (Van Hout & Bingham, 2013), the substances trafficked (Broséus et al., 2016) and the structure of cryptomarkets (Duxbury & Haynie, 2017). Many of these studies focus on Silk Road 1.0 (Barratt et al., 2013) and their most known successors, such as Silk Road 2.0 and Alphabay (Tzanetakis, 2018). The available research indicates that drug cryptomarket participants come from all over the world but vendors in particular are mostly living in Western countries such as the United States, the United Kingdom, the Netherlands, Germany and Canada (Christin, 2013).

Some countries and federal institutions have rightly jumped on this bandwagon by producing trend reports, such as the National Drug & Alcohol Research Center (NDARC), shedding light on the phenomenon from an Australian involvement. Additionally, some national Ministries, such as The Netherlands Ministry of Security and Justice (Kruithof et al., 2016), commission scientific studies to get insight on the phenomenon in a particular country.

Despite the increasing academic and policy interest, much is still unclear. Until recently, no studies exist targeting Belgian buyers and vendors on more recent cryptomarkets, leaving a blind spot in cryptomarket research.

2. Research design and methods

In order to fill this blind spot, the research project, CRYPTODRUG, aimed to shed an exploratory, yet necessary, first light on Belgian buyers and vendors' behaviour on cryptomarkets. This study did not only focus on the Belgian vendors selling illicit drugs, but also aimed to get a first insight on Belgian consumers who are buying drugs from cryptomarkets (and using drugs themselves)[1]. As such, it aimed to gain insight in the drug-demand side by examining the ways in which the dark web is used by Belgian users and its possible influence on drug using careers. After all, while these cryptomarkets continue to grow, they might open the market up to a wider audience or affect the drug careers of individual users (EMCDDA, 2016, Eurotox, 2017).

In order to study this, a multidisciplinary team, including SSH and STEM researchers, was composed. This short-term research project, funded by the Belgian Science Policy Office (BELSPO) started in March 2019 and ended in February 2020. CRYPTODRUG was coordinated by prof. dr. Charlotte Colman (Ghent University). The other partners in the research team were prof. dr. Antoon Bronselaer (promoter Ghent University), prof. dr. Marie-Sophie Devresse (promoter, UCL Catholic University of Louvain) and dr. Tina Van Havere (subcontractor University College of Ghent).

1 **Belgian users of cryptomarkets** and **Belgian buyers from cryptomarkets** were used interchangeably. With those concepts we mean persons who buy from cryptomarkets. During the survey and the interviews we verify whether these persons also use drugs themselves or whether they mainly buy from cryptomarkets to supply others.

This overall objective could be subdivided in **four sub-objectives:**

1. Gaining insight in the size and profile of Belgian vendors on cryptomarkets
2. Exploring the role of cryptomarkets in individual drug-using careers of Belgian buyers
3. Understanding the experiences, rationale and motives of Belgian buyers to buy illicit drugs from cryptomarkets.
4. Drafting recommendations for research, policy and practice based on the CRYPTODRUG results

The above-mentioned research objectives could be translated in the **following research questions:**

1. RQ 1: What is the size and profile of Belgian vendors on cryptomarkets?
2. RQ 2: What is the role of cryptomarkets on the drug using careers of Belgian buyers?
3. RQ 3: What are the experiences, rationale and motives of Belgians to buy illicit drugs from cryptomarkets?
4. RQ 4: What can policy, practice and research learn from the first results of CRYPTODRUG?

In order to answer the above-mentioned research questions, a mix of quantitative and qualitative methods was applied i.e. data-scraping, an online survey and semi-structured qualitative interviews.

Research question 1 targeted Belgian vendors on cryptomarkets.

The quantitative assessment was conducted through the **collection and analysis of scraped data from three cryptomarkets** (Dream Market, Wall Street Market, and Empire Market), in different time intervals, from November 2018 until November 2019.

Research questions 2 and 3 targeted Belgian buyers from cryptomarkets.

These research questions were answered by a multi-method approach consisting of both quantitative and qualitative measures. These included both online surveys (RQ 2) and semi-structured interviews (RQ 3).

First, **an online survey** was developed to gain a quantitative insight in the drug using career of Belgian buyers (N= 99) on cryptomarkets. Attention was paid to drug career variables (frequency, intensity, escalation, switching, expansion, substitution and recovery of drug use), the link with offline markets as well as general variables such as gender, age, educational attainment and employment status. Additionally, other questions focused on experiences and practices users have when buying their drugs on cryptomarkets and how they experience this online shopping in its whole (from entering the dark web until the delivery).

Second, **semi-structured interviews** took place to collect additional information on the user's perspective (N= 10) Therefore, respondents participating in the online survey (RQ2), were invited to take part in a semi-structured interview, aimed to explore the perceptions, rationale and motivations of Belgian users to buy drugs from cryptomarkets. Particular attention was paid to their involvement and experiences on offline markets.

Research question 4 focused on **the integration of the above-mentioned**

CRYPTODRUG is the first research to assess insights on illicit drug demand and supply on cryptomarkets from a Belgian perspective. It opts to collect evidence on the size and profile of Belgian vendors on cryptomarkets, improve our understanding on the attractiveness of cryptomarkets as well as its role in individual drug using careers of Belgian buyers from cryptomarkets.

3. Discussion and conclusions

In this section we focus on the main empirical results of the scraping, the survey and the interviews. For a detailed presentation of the data we refer to the overall CRYPTODRUG report.

A. What have we learned from the Belgian supply side on cryptomarkets?

Based on the results of the scraping targeting Belgian cryptomarket vendors, the following highlights could be distinguished.

1. Illicit drug trade on cryptomarkets is on a rise and Belgian vendors are jumping on the bandwagon

Dark web illicit drug trade could be considered as an evolution in criminal activities in general and in drug supply more specifically (Broséus et al., 2016). Nevertheless, illicit drug trade on cryptomarkets accounts for less than 1% of global drug trade turnover (Décary-Hétu & Giommoni, 2016). Figures from 2016 indicate that the turnover of cryptomarket market share is estimated to range from 170 million to 300 million USD a year (UNODC, 2018), while global drug trade turnover is estimated to range between 426 billion and 652 billion USD (May, 2017; Kowalski et al., 2019). Yet, research (eg. Winstock et al., 2016) shows that the supply of drugs via the dark web is still a very young phenomenon, that could potentially develop further (UNODC, 2018).

The number of Belgian product listings and vendors on Dream Market and Wall Street Market follows the global growth pattern up to a certain degree; The Belgian number of transactions

executed on these cryptomarkets between October 2018 and April 2019[2] clearly **shows a strong and consistent growth trend even though the scale of the Belgian market is a small fraction of the global total.** The development of cryptomarket turnover as seen on Empire Market from April 2019 until November 2019 indicates a similar steady upward growth trend.

Compared to other nationalities, Belgian vendors, listings, transactions, and total turnover are relatively rare, namely less than 1%. Similar patterns have been found on other cryptomarkets, studied by international researchers, as well. To compare, a longitudinal analysis of a market called 'Evolution' by Broséus et al. (2017) indicates that Belgians had a share of roughly 1.3% of the global amount of drug-related listings on this cryptomarket back in 2015. Tzanetakis (2018) analyzed 'Alphabay' in 2015- 2016 and estimated a lower Belgian share of around 0.4% (the most prevalent -25,3%- are packages shipped from the US), although Belgium was still in the top 15 of vendor's country of origin. In 2018, the EMCDDA commissioned a study to gain insight in European vendors, which collected regular snapshots from four dark web markets (Dream Market, Berlusconi Market, Valhalla and TradeRoute) during the period of July 2017 to August 2018 (EMCDDA 2018). The data collected showed that most transactions originating from the EU were sent from three countries: the United Kingdom (28.2 million euro in total sales), Germany (18.8 million euro) and the Netherlands (10.3 million euro). Sales originating from Belgium had much lower values i.e. 1.0 million. It must however be noticed that often -in around 25% of the cases- the vendor's country of origin is unknown or ambiguous (Tzanetakis, 2018).

Studies on different cryptomarkets indicate that cannabis, synthetic drugs (MDMA and amphetamines) and cocaine are the most popular drugs sold online, representing about 70% of all sales (Paquet-Clouston et al., 2018; Soska & Christin, 2015). The above-mentioned EMCDDA study found out that in the top three countries generating most sales, UK, Germany and the Netherlands, the highest revenue-generating substances were cannabis, cocaine and other stimulants (EMCDDA 2018). **To compare, the Belgian drug offer on the studied cryptomarkets, Dream Market and Wall Street Market, does not show a marked specialization as a diversity of drug categories ranging from cannabis to ketamine are offered.** Nevertheless, synthetic drugs like MDMA and amphetamines are represented continually and in larger than average numbers. This may not be surprising given the fact that these products are easily accessed by Belgian vendors. That is, Belgium together with the Netherlands, are the top production countries of MDMA and amphetamines, distributing these products worldwide with high profits thanks to their location in the supply chain (Colman, De Middeleer et al., 2018; Tops et al., 2018). It deserves mention that **the Belgian side of Empire Market, nevertheless, seems to correspond more to the international patterns in terms of listings and turnover**: cannabis and cocaine are the most important, followed by heroin and MDMA / ecstasy.

[2] The data collection of Dream Market ended in March 2019, due to the market's exit

2. Belgian vendors ship across borders

Cryptomarkets facilitate cross-border drug trade. As a consequence, the most vulnerable aspect of online drug trade is the shipment of the products through regular mail services, especially when the illicit drugs are shipped beyond international borders (Décary-Hétu et al., 2016). After all, this is the first time that the virtual cryptomarket transactions enter the physical domain.

In line with studies on other countries (Broséus et al., 2016), our study found that **Belgian vendors on Dream Market and Wall Street Market generally ship international: across the EU and/or worldwide**. Although it was not possible in all cases to identify the specific shipping destinations, it indicates that Belgian vendors are capable and willing to ship across borders. Only one Belgian vendor (5 listings, visible on Dream Market) indicates that he is willing to ship all his listings *only* domestically, possibly to lower the chances to be seized by law enforcement. As mentioned by Norbutas (2018), domestic drug trade in cryptomarkets could be underestimated due to a lack of information on the seller's origin country making calculations on the fraction of international shipments from cryptomarkets difficult. Norbutas (2018) further indicates that although cryptomarkets imply the possibility to access worldwide markets, rational cost and benefit calculations (regarding detection by law enforcement, or shipping time) could enforce geographical clustering of vendors and buyers and as such, especially domestic shipping. Furthermore, the research by Dittus et al. (2018) suggests that there are other geographical restrictions as well: the bulk of cryptomarket drug sales and revenues for different plant-based drugs is mostly made in countries where that specific drug is highly consumed (and not in the countries where the drugs are produced).

Recent research has indeed indicated that vendors become increasingly concerned about the risk of detection, possibly influencing online market developments (Bakken & Demant, 2019). As such, **equally interesting to notice are the destinations Belgian vendors will not ship to and the changes in shipping origins.** Some Belgian vendors indicate for example that they will not ship to North America or the Netherlands. This could be due to the more severe sanctions towards illicit drug trade in the Americas and the increased attention of the Dutch government to tackle illicit drug trade leading to a perceived increased risk of detection. Dutch mail stamps on international packages might furthermore raise suspicion with any foreign customs service, as the Netherlands has a reputation as one of the main global suppliers of illicit drugs (Tops et al., 2018)

Although the majority of Belgian vendors on Dream Market and Wall Street Market ships exclusively from Belgium, some vendors have different shipping origins besides Belgium, most commonly the Netherlands. During our measurement, some vendors have additionally changed their shipping origins to Germany or to solely Belgium instead of both Belgium and the Netherlands. This too, could be a result of the perceived effectiveness of law enforcement to detect postal drug packages in the vendor's own jurisdiction (Décary-Hétu et al. 2016), but this couldn't be confirmed based on the study's research design.

3. Belgium and the Netherlands: one playground?

Recent research has acknowledged the connection between Dutch and Belgian drug markets, particularly the cannabis market and the synthetic drugs market (Colman et al., 2018). Professional cannabis cultivation and the production market for synthetic drugs in Belgium have evolved mainly under the influence of an integration of Belgian and Dutch organized crime groups. This integration occurred much earlier in the synthetic drug market than in the cannabis market. In the nineties, Dutch criminal organizations in the South of the Netherlands started to focus on synthetic drug production in the Belgian-Dutch border area. Over time, this Belgian-Dutch cooperation extended to the entire chain of synthetic drug and cannabis production and trafficking.

Given the shared role of Belgium and the Netherlands in the production and trafficking of cannabis and, especially, synthetic drugs, it would be interesting to verify whether this connection could also be found on online drug markets. In fact, there is some evidence for this connection found in the CRYPTODRUG study. As mentioned earlier, some of the vendors shipping from Belgium, also ship from the Netherlands. Approximately 45% of the Multiple Origin Vendor's[3] listings on Wall Street Market are shipping from both Belgium and the Netherlands. The handful of Multiple Origin Vendor's listings that are visible on Dream Market are all, with one exception (Germany), shipping from the Netherlands and Belgium. An individual case that deserves mention in this respect, is a vendor shipping from Luxembourg, who indicates to ship worldwide with the exception of Luxembourg, Netherlands, and Belgium.

These data might imply **the use of the Dutch-Belgian border in illicit drug trade**. However more research, especially through other methods, is required to study this (possible) link. For instance, it is uncertain whether the tactics of organized crime groups (making use of the differences between the two jurisdictions) are related in any way to the practices that have been observed during the CRYPTODRUG project (where vendors might for instance change location to avoid a suspicious stamp on their packaging).

4. Linking Belgian vendors with retail level suppliers?

Some research indicates that, although absolute numbers of transactions tend to be completed mostly on the retail or user level (hence the common trope of 'Ebay for drugs' (Barratt 2012)), a substantial share of turnover actually comes from wholesale transactions (Kruithof et al. 2016; Aldridge & Décary-Hétu 2016). There might be competing interests at stake: on the one hand it can be attractive for vendors to sell their goods in large quantities, as this raises their overall sales volume and turnover. Yet on the other hand, as concluded by Décary-Hétu et al. (2016) it is less likely for a package or letter to be intercepted if it is as small and thereby as inconspicuous as possible.

[3] A Multiple Origin Vendors is a single vendor who indicates to ship different products from different locations

The results from Empire Market suggest that Belgian vendors are not too eager to send their goods in bulk. No wholesale transactions were recorded upward of €1.000, and more than 90% transactions had a value of less than €200. It is hard to decide upon a cut-off point to separate user or retail amounts from wholesale, due to for instance the price differential between different drugs or differences in use habits. Yet the pattern noted in Kruithof et al. (2016) is replicated: a substantial amount of the income, over one third in the current case, of Belgian cryptomarket vendors is likely to be earned through larger transactions.

5. Belgian migration to other cryptomarkets after market shocks

Ever since the current system of dark web illicit drug trading emerged, estimates of the turnover and amount of users have grown incessantly. User-friendliness and the perception of cryptomarkets as ways to procure drugs with limited risk, among other motivations, might guide more and more consumers to these markets (EMCDDA, 2017).

Although large scale disruptive actions by law enforcement, like Operation Bayonet, have marked short term effects, market gaps are rapidly filled by new or existing markets and vendors. Technical security updates are often put in place, after which the process starts over (Ladegaard, 2019). Oftentimes, what is observed in the period after a disruption by law enforcement, can be seen as an example of participant displacement, if one compares different cryptomarkets in the online world to different geographical areas in the offline world (Décary-Hétu & Giommoni, 2016). Such law enforcement operations may have eroded consumer confidence in the security of these marketplaces. Nevertheless, an EMCDDA and Europol analysis shows that revenues and trade volumes associated with drug sales across the darknet had returned to pre-enforcement levels one year later (EMCDDA, 2017)

The growth pattern observed before and after the cessation of Dream Market implies support for these patterns observed before. First of all there is the overall line of growth of Belgian sales and numbers of vendors observed on both Dream Market and Wall Street Market. But secondly, right after Dream Market ended its operations, the Belgian part of Wall Street Market saw a large boost in activity. Combined with the observation that several Belgian vendors start with listings on Wall Street Market right after, using a name that could be found before on Dream Market, we could suspect that a displacement effect amidst an existing growth pattern may provide an explanation.

B. What have we learned about Belgian buyers from cryptomarkets?

Based on the results of the online survey (N 99) and the interviews (N 10) with Belgian cryptomarket buyers[4], the following highlights could be distinguished.

Before presenting the main results, we would like to stress **the limitations of our survey results**. It is important to note that all 99 respondents had the choice whether to reply to a certain survey question or not. As such, some respondents opted to skip some questions. The number of missing values (sometimes around 60%), is however an important limitation of this study. After all, these missing values reduce the representativeness of our sample and could lead to inaccurate associations between variables. Rather than completely deleting the variables, we chose to limit the analysis to a univariate description of the data (with a few exceptions). As such, we would like to stress the **exploratory** nature of the data found and encourage the readers not to generalize the findings to "all Belgian cryptomarket users".

1. Profile of the CRYPTODRUG respondents: Young males, working full time

Despite national differences some overarching patterns in international literature on cryptomarket buyers can be discerned. Cryptomarket buyers are **mostly young, working males**. The latest Global Drug Survey (Winstock et al., 2019) found out that over 60% of those who had bought from cryptomarkets were aged 30 or below. 65% of their dark web buyer sample consisted of males, which was even slightly higher than the overall rate of males among GDS participants. In a similar gist, the Australian sample from Van Buskirk et al. (2016) indicates that cryptomarket users were younger and more likely to be male relatively to the rest of their drug user sample. Furthermore, the respondents in the study of Bancroft and Reid (2016) were male, between 20-25 years old, holding a college degree and considered themselves as recreational users. A similar sample was used in the study of Bancroft & Masson (2018) which consisted of young working or studying males.

The CRYPTODRUG respondents specifically turn out to be relatively similar to other cryptomarket user samples with regards to demographics. Our sample, in both the survey and the interviews, consists solely of males, who are mostly in their twenties or early thirties and who have a professionally active life. The participants' principal reasons for drug use are recreational, although some do report functional use.

[4] Belgian users of cryptomarkets and Belgian buyers from cryptomarkets were used interchangeably in this report. With those concepts we mean persons who buy from cryptomarkets. During the survey and the interviews we verified whether these persons also use drugs themselves or whether they mainly buy from cryptomarkets to supply others.

2. Drug using careers: looking for a different menu

Data from the Global Drug Survey (2016) indicated that the majority of cryptomarket drug buyers are recreational drug users who have used drugs before they started buying from cryptomarkets. However, 5% of those accessing cryptomarkets did not consume drugs prior to accessing them, and 32.1% reported accessing a wider range of drugs than they had previously. Therefore, we might suspect that cryptomarkets could influence individual drug careers, including onset, frequency, intensity, escalation, switching, expansion, substitution and recovery.

CRYPTODRUG respondents tried illicit drugs for the first time between their mid-teens and early twenties. Their main onset drugs was marihuana, supplied by friends. Today, most CRYPTODRUG buyers use drugs to party, to relax or as experimentation. The most frequently used drugs in the past 12 months, mentioned by the respondents in the interviews, is XTC. The respondents who answered this question in the survey, indicated that cannabis is the most frequent and most intense drugs used in the past 12 months. However, most of the CRYPTODRUG respondents are polydrug users, combining cannabis, XTC, cannabis, ketamine, amphetamines, LSD and/or 2C-B. Yet, they perceive themselves as recreational users, non-problematic users, associating drug use with leisure time activities.

It also seems that the **frequency** of drug use by the CRYPTODRUG respondents does not change once cryptomarkets are accessed. This is the case for participants' reported use patterns over the years, as well as when asked for their own assessment of how their use patterns had changed.

95% of the CRYPTODRUG respondents who have filled in the survey question, **have bought drugs offline before buying it from cryptomarkets**. This finding is in line with other research stating that users have mostly consulted offline markets before turning to cryptomarkets (Bancroft & Reid, 2016; Kruithof et al, 2016; Barratt, Lenton, Maddox & Allen 2016; Winstock et al., 2016). Furthermore, 38% of the CRYPTODRUG respondents indicates in the survey that they have at some point in their lives bought illicit drugs over the clear net.

In contrast, the survey and interview results indicate that the **range of substances taken by the CRYPTODRUG respondents did increase**. Based on the results of the survey, we know that respondents, who filled in this question, used an average of 2.65 new drugs since discovering cryptomarkets. The principal drug categories are LSD, 2C-types and to a lesser extent ketamine and cocaine. Around or over half of the respondents had accessed these products, in particular LSD and 2C-types, for the first time when they bought it from cryptomarkets. These results are comparable to the data from the Global Drug Survey (Winstock, et al.,2019) in which the consumption of a wider range of drugs was reported by 31,31% of the sample. Similarly, the study of Barratt, Ferris & Winstock (2016) revealed that a 'greater range' was key in their decisions to source drugs from cryptomarkets. In their narrative review of the emerging literature connected to drug cryptomarkets, Aldridge et al. (2018) therefore conclude that cryptomarkets are likely to provide a new mechanism for the diffusion of specific drugs into new locales in which they were previously unavailable.

The CRYPTODRUG participants' drug using careers cannot be compared sufficiently to any statistics of drug use in the overall Belgian population. For one, it is uncertain to what degree the

CRYPTODRUG sample contains a representative image of all Belgian cryptomarket users. Indeed, there is evidence that suggests purposive sampling surveys can give an approximation of the results given by classical household surveys (Barratt et al. 2017). Notwithstanding there is research available on drug use in Belgian society (Gisle & Drieskens 2019; EMCDDA 2018), there is no such information on the degree of cryptomarket use within wider Belgian society. Without this connecting parameter, no sensible comparison can be made.

Also, whereas 'availability' of a substance has a somewhat passive connotation, the availability through cryptomarkets seems to be mediated by an active attitude in our CRYPTODRUG respondents. "*Knowing that cryptomarkets exist*" does not equate to "*being able to order drugs efficiently and swiftly through cryptomarkets*." As this pro-activeness in making substances available is a common trait in cryptomarket users and seems related to a more responsible form of drug use (Van Hout & Bingham 2013), it should not be too surprising that "*mere availability of cryptomarkets for illicit drug transactions does not determine an increased use*" (Barratt et al. 2016, pg. x).

3. Belgian buyers: buying for personal consumption, but willing to share

The median amount spent on cryptomarket drug transactions by CRYPTODRUG respondents who have filled in this particular survey question, is **100 to 250 euros over the last 12 months.** However, more than half of the respondents spent more than 250 euros and more than 20% of the respondents spent more than 1000 euros in the last 12 months. Less than a quarter of the CRYPTODRUG respondents indicate that they have bought on a monthly basis or more frequent over the last 12 months**. Most of the respondents indicate that they have only purchased a few times from cryptomarkets in the past 12 months.**

Almost all CRYPTODRUG respondents (97%) who have filled in this survey question, buy (also) for their **own use**. More than half of the respondents indicate to (also) buy for friends; 6% buys for clients. **2 out of 4 respondents who have indicated to buy for clients, have spent between 1000 and 5000 euros in the last 12 months.**

During the qualitative interviews, nine out of ten respondents revealed they are reluctant to transition to commercial supply. Sharing their supply with friends, primarily when going out, seem to originate in a certain protective attitude towards their social circle i.e. providing the drugs in a (perceived) safer way, and in the fact that they would not like to interact with the riskier social environment that offline drug dealers are thought to participate in. The friends they share their drugs with are mostly not aware of their source of supply even though the respondents are not actively hiding this from their peers. Only one CRYPTODRUG respondent shares his experiences with cryptomarket buys with friends, although these friends don't seem to be interested in this. Some interviewees, however, make joint purchases from time to time with a group of peers. This might be said to be an alternative form of social supply, whereas instead of one person supplying others, a group of people pools resources and risks.

These results are consistent with findings from international research. For example, the study of Demant, Munksgaard and Houbourg (2018), who have crawled Agora Marketplace and Silk Road 2.0, indicates that cryptomarkets cater for a specific group of customers who purchase drugs for themselves and their social networks.

4. Discovering cryptomarkets with a little help from a friend?

While the onset of drug use of our CRYPTODRUG respondents (principally in their mid-teen to early-twenties) was mainly influenced by peers in offline settings, purchasing from cryptomarkets is less influenced by their offline peers. CRYPTODRUG respondents indicated in the survey that **they learned about cryptomarkets mainly through online media** such as online fora on the clear web (45%), mass media (17%), online fora on the dark web (12%) and social media (5%), making them curious to discover this phenomenon. Only 21% of the participants were introduced to the cryptomarkets by real life friends.

These results slightly differ from the results gathered during the Global Drugs Survey (GDS) in 2019. In contrast to the CRYPTODRUG respondents, the main part of the sample (57,9%) from the Global Drugs Survey 2019 reported to learn about cryptomarkets by real life friends.

5. Belgian cryptomarket users are only interested in the transaction itself , not in becoming part of the dark web community

In general, the interviews with CRYPTODRUG respondents revealed that their cryptomarket purchasing process is primarily **a solitary endeavor.** Similarly, they are not active in the dark web community and/or forums. They indicate that they read posts on these forums from time to time, but they rarely actively engage in any discussions due to a lack of interest.

Other studies, interviewing cryptomarket users, found out different results regarding the conceptualisation of these dark web spaces. Based on interviews with nine cryptomarket users, Masson and Bancroft (2018) found that cryptomarket buying is much more than a transaction between vendors and buyers, rather it is a social, community-building activity. Cryptomarkets serve as constructive communities negotiating and exchanging information on drug use and supply such as sharing harm-reduction information. As such, dark web communities may act as forums enabling information sharing for reducing the drug risk and harms (Aldridge et al., 2018; Bancroft, 2017).

Only one CRYPTODRUG respondent says he actively participates in dark web communities and advocates the free exchange of drug-related knowledge and experiences.

Yet, for most of the CRYPTODRUG respondents, who simply use the dark web for transactions, the **potential of those communities acting as a platform to share harm-minimizing information seems to be nil.** Yet, during the online survey, all of our CRYPTODRUG respondents said that they looked up information online and/or offline on how to use drugs (safely). That is, **more than 60% of them**

obtained this (harm reduction) information from online forums, followed by real life friends (21%). Hence, depending on the perspective one takes, there might be potential for these online user-generated discussion platforms to play a role in harm-minimisation.

It could be possible that the information exchange taking place in cryptomarket-related communities only represents a limited share of total cryptomarket drug users. To what extent this is random or biased might deserve further research.

6. Motivation to buy from cryptomarkets: the offer is key

80% of the CRYPTODRUG respondents who have filled in this particular survey question, have recently bought drugs offline, indicating that cryptomarket purchases are not their single source of supply. Also the interviews revealed that most of our participants considered **the option of cryptomarkets only after they had a certain demand that they wanted to fulfil.** That is, they either had already tried a substance and wanted easy access through cryptomarkets, or they had read about a substance and wanted to try it but were unable to purchase it in the offline world. CRYPTODRUG respondents who have filled in this particular survey question, **evaluate their cryptomarket purchases more positive than their offline purchases**, although they don't seem negative about their offline buys i.e. 13% evaluate their offline purchases mostly negative to very negative. 51% of the CRYPTODRUG respondents evaluated their offline drug purchases as mostly positive to very positive, while 84% of the CRYPTODRUG respondents evaluated their cryptomarket drug purchases as mostly positive to very positive.

The principal reason to start buying from cryptomarkets is because of the offer (60% of the respondents who filled in this question), followed by curiosity (52% of the respondents who filled in this question) and the price (52% of the respondents who filled in this question) of the products. In contrast, anonymity from law enforcement was only a prime consideration for 31% of respondents, and anonymity from others only 23%. Security concerns, in other words, do not seem to be a principal drive for respondents to start buying drugs on cryptomarkets (see also infra 9). This result is also reflected in the interviews: the large offer of different drugs as an important reason to start buying from cryptomarkets.

CRYPTODRUG respondents state that they started to use cryptomarkets because they wanted to use substances like LSD, ketamine or 2C-B. Yet, these substances were hard to find outside of cryptomarkets. Participants' offline channels were mostly used for cannabis, and to some extent for other "traditional" illicit drugs like ecstasy, cocaine, or amphetamines.

The CRYPTODRUG interviewees also mentioned **the reason to continue their cryptomarket purchases**, namely: 1) the high drug quality (mostly expressed in terms of drug purity), 2) the competitive prices (particularly for MDMA / ecstasy), and, just like the reason for the onset of cryptomarket use, 3) the large offer of different drugs that are less easy to find in real life, according to our participants.

Research indicates that there are several benefits that make people turn to cryptomarkets. Customers can compare information about the quality and the type of drugs, prices and vendors

thanks to the transparency of cryptomarkets (Tzanetakis, 2018). The number one reasons for people buying from cryptomarkets are the price (Ormsby, 2016), product quality (Kowalski, 2019) and – as mentioned earlier - the wide range of products (Van Hout & Bingham, 2013; Barratt et al., 2013), including the availability of their drug of choice (Ormsby, 2016). Also the study of Barratt, Ferris & Winstock (2016) revealed that a 'greater range' was key in their decisions to source drugs from cryptomarkets. Participants from samples across Australia, the UK and the USA indicated the wide range of products as their main reason for purchasing drugs on cryptomarkets among other motivations such as the convenience of purchasing drugs online and the quality of the products.

It is however important to keep in mind that "**product quality**" can have multiple meanings such as chemical purity, the experience of taking the drugs, financial security or reliability. Nevertheless, all participants in the study of Bancroft & Reid agreed that the product quality on dark web markets is reliably good. One of their interviewees for example stated that it is possible to obtain a good quality product offline but not as cheaply and reliably as on cryptomarkets. Research conducted by Barratt et al. (2016) reported a higher chance of purchasing a low purity product or a product that doesn't contain the expected substance on alternative drugs sources such as in-person dealers or open markets.

7. What makes a cryptomarket vendor a reliable vendor according to the Belgian cryptomarket buyers?

Aldridge & Decary-Hétu (2016) characterise cryptomarkets as anonymous open marketplaces, allowing the diffusion of drugs across locales. In contrast to offline transactions, mostly taking place in closed marketplaces in which dealers sell primarily to customers they know, anonymous cryptomarkets vendors need to incorporate some strategies in order to be attractive to buyers. These strategies have been acknowledged in different studies, stating that the anonymity of vendors on cryptomarkets can indeed function to make cryptomarket vendors less accountable for the products they sell. The review systems partly resolve this problem by providing reviews from previous buyers and aggregated sales feedback metrics that guide new users to reliable sellers (Aldridge, 2019). Bad ratings lead to significant sales reductions and market exits (Bhaskar, Linacre, & Machin, 2019).

When looking for a vendor to buy from, the interviewed CRYPTODRUG respondents pay attention to the following basic criteria: 1) the vendor's amount of transactions 2) their reputation marker and 3) his/her reviews. As found in other studies as well, these review systems are used by the CRYPTODRUG participants for the selection of suitable and reliable vendors and for the detection of so-called "malicious vendors".

Furthermore, **CRYPTODRUG users prefer buying from a vendor, shipping from Belgium or from one of our neighboring countries such as the Netherlands or Germany**. Other selection criteria that CRYPTODRUG respondents use, specifically applicable to cryptomarkets are: a detailed, professional description of the product (often including harm reduction information) and a vendor who specializes in one type of drugs, rather than someone who offers a broad range of products. These criteria equals **the CRYPTODRUG respondents definition of a "reliable" vendor**. This strategy could

be confirmed by the research of Tzanetakis, et al. (2018), who indicates that vendors try to attract new customers by mobilizing trust on their side. The profile page of a vendor plays a crucial role as it is the first source of information a customer can consult. The vendor profile displays amongst others the overall numerical satisfaction ratings, the number of completed shipments.

8. A rather careless attitude towards risks

Thanks to their potential to distribute illicit drugs beyond vendors' physical environment, cryptomarkets could provide a (relatively) anonymous and (perceived) safe platform for illicit drug trades in comparison to offline trade (Aldridge et al., 2017).

Although different types of risks could occur on cryptomarkets such as loss of money, exit scams, seizure by customs or types of violence such as doxxing, research indicates that there is a perceived lower level of risk associated with illicit drug trade on cryptomarkets (Barratt et al., 2016).

A narrative review conducted by Aldridge, Stevens and Barratt (2018) indicated that cryptomarket buyers reported fewer threats to personal safety and violence than reported in connection to offline sourcing through known dealers, strangers and even friends. Research conducted by Barratt, et al. (2016) presented that a high number of participants reported more threats to their personal safety when they obtained drugs through alternative drug sources such as in-person dealers or open markets. The study also showed that respondents experience higher levels of physical violence while obtaining drugs through alternative resources.

CRYPTODRUG respondents indicate to be well aware of the diverse range of risks, yet, they perceive **the risk as low.** The perceived risks identified by the CRYPTODRUG respondents could be classified in three categories: risks from market vendors, risks from market administrators and risks from law enforcement. Just like mentioned in other studies, to them, the main risk is losing money, yet this is perceived as part of the system, a price they pay for the convenience of ordering from home. **Threats from law enforcement are seen as minimal.** Specifically, they feel that police forces in Belgium don't prioritize this type of offense. They also state that law enforcement actors are not sufficiently resourced to effectively tackle this phenomenon.

The CRYPTODRUG participants **prefer to buy from local vendors,** as they perceive an higher risk of interception if the shipment passes too many international borders. As such, they prefer buying from a vendor that ships from Belgium or from one of Belgium's neighbouring countries such as the Netherlands or Germany. These results confirm the geographical constraints of international transactions on cryptomarkets as described in scientific literature (Tzanetakis, 2018; Dittus et al. 2018). Possible explanations are risk-aversion strategies and the fact that cryptomarkets are capable of satisfying local demand (Demant, Munksgaard, Décary-Hétu, & Aldridge, 2018).

9. No particular interest in being up to date about the latest dark web security development

Traditionally, online drug sales have occurred in chat rooms and discussion forums. Only recently, a second generation of online market places emerged, known as cryptomarkets (Martin, 2014). The security and anonymity built into cryptomarkets are a defining feature of cryptomarkets, distinguishing these from other online (Decary-Hétu, Paquet-Clouston, & Aldridge, 2016).

Based on other research (Van Hout & Bingham, 2013; Gehl, 2018), we would expect that operational security is a major focus for cryptomarket users. Yet, the observed minimal use of security enhancing features by most of the CRYPTODRUG respondents was surprising, although they are quite aware of different possibly malicious actors, about what strategies these actors might apply, and about the occurrence of such negative events in the past. Surveys with drug using individuals, both in the case of CRYPTODRUG and in other cases like the research of Van Buskirk et al. (2016), indicate that **security is of much less interest to them.**

Most of the CRYPTODRUG respondents turn out to merely abide by the minimal security rules posed by the mechanics of cryptomarkets and any additional procedures given by vendors themselves. This casual attitude furthermore corresponds to findings that, when users select a cryptomarket, the amount of security features put in place by the market administrators does not matter either. Evangelista et al. (2018), for instance, has shown that differences in security features exhibited by cryptomarkets, is not linked to the specific market's size or growth. The same apparently applies to the implementation of security measures once a buyer has entered a cryptomarket, as suggested by our interviews.

Nevertheless, evidence does suggest that there are differences in the perspective on security of participants: such as North America or Oceania (Barratt et al. 2014). The stringency of the Australian border protection, for example, creates an additional risk and uncertainty for local users buying from foreign cryptomarkets. This results in higher drugs prices due to the perceived risk of interception at the Australian border (Cunliffe, Martin, Décary-Hétu, & Aldridge, 2017). Therefore, it might be interesting to test in future research whether the focus on OPSEC for cryptomarket users differs by their region's drug policy or other regionally diverging factors.

C. Will cryptomarkets continue to grow?

Ever since the current system of dark web illicit drug trading came into existence in the early 2010's, estimates of the turnover and amount of users have grown. User-friendliness, the large range of substances on offer and the perception of cryptomarkets as ways to procure drugs with limited risk, among other motivations, might guide more and more consumers to these markets (EMCDDA, 2017).

Although large scale disruptive actions by law enforcement like Operation Bayonet have marked short term effects, market gaps are rapidly filled by new or existing markets and vendors. Oftentimes, what is observed in the period after a disruption by law enforcement, can be seen as an

example of **participant displacement**, if one compares different cryptomarkets in the online world to different geographical areas in the offline world (Décary-Hétu & Giommoni, 2016). The results of the scraping (Chapter 3) observed the growth pattern before and after the cessation of Dream Market. It implies support for these two patterns observed before. First of all there is the overall line of growth of Belgian sales and numbers of vendors observed on both Dream Market and Wall Street Market. But secondly, right after Dream Market ended its operations, the Belgian part of Wall Street Market saw a large boost in activity. Combined with the observation that several Belgian vendors arrive with listings on Wall Street Market right after, with a name that was before to be found on Dream Market, the displacement effect amidst an existing growth pattern seems to provide an explanation.

During the survey and interviews, CRYPTODRUG respondents were asked about the impact of market shocks such as exit scams or shutdowns. **The negative impact appears to be minimal**. 62% of the respondents who have filled in the survey question, continued to buy from cryptomarkets, others migrated to clearnet or offline dealers or haven't purchased anymore. Furthermore, on the long-term, 80% of the respondents, completing the question, estimate that they would continue to buy (also) from cryptomarkets. These results correspond to findings from international research (Bhaskar, Linacre, & Machin, 2019), suggesting that the deterrent effect of exit scams seems to be limited as cryptomarkets rebound quickly after a shutdown or exit scam.

4. Recommendations for practice, policy, and research

The primary goal of CRYPTODRUG is to provide evidence on the phenomenon of cryptomarket drug trade. The results that are discussed so far should provide researchers, policy makers, and practitioners with valuable input to address this phenomenon.

As such, this section describes some recommendations for policy, practice and research.

In line with our integral and integrated Belgian drug policy, **recommendations for policy and practice** will be included addressing both the **drug demand and drug supply** side related to online drug trade via cryptomarkets. Both drug demand and drug supply recommendations should not be considered as opponents, but rather as complimentary actions in our integral and integrated drug policy.

Afterwards, we will include **recommendations for future research**. Starting from our experiences in conducting research online, we will share some practices and recommendations that might be helpful in improving research in the realm of cryptomarket-related drug trade and related fields of research.

Drug supply recommendations

a) Invest in the systematic monitoring of cryptomarket drug trade
b) A need to invest more in traditional investigation in addition to online detection techniques, as well as in composing multidisciplinary investigation teams
c) Further explore the possibilities to enhance the public-private partnerships
    i) Enhance the cooperation with postal and courier services and monitor new trends in shipments
d) Enhance the international exchange of information
e) Target trust in drug cryptomarkets
f) Invest more in financial and money laundering investigations as well as the confiscation of proceeds

Drug demand recommendations

a) The potential of sharing harm reduction information on dark web forums and beyond
    i) Further invest in sharing harm reduction information on dark web and clear web forums
    ii) Encourage vendors to share harm reduction related information and ban malicious vendors causing potential harm
b) Further invest in evidence-based prevention and treatment interventions

Recommendations for research

a) Systematic monitoring of and research into drug-related activity on cryptomarkets
    i) Development of a crawling tool
    ii) A holistic approach to study cryptomarkets
b) Establish structural partnerships, combining SSH and STEM researchers, to study drug-related activity on cryptomarkets

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