



The State of Opioid Sales on the Dark Web

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1. Introduction

In 2016, LegitScript prepared a report for CSIP on the state of the internet pharmacy market, including market trends, challenges, and opportunities. That report found that about 96 percent of websites marketing pharmaceuticals on the open internet — somewhere between 30,000 and 35,000 — failed to adhere to applicable legal requirements. Of those, the vast majority (all but about five percent) were blatantly illegal and unsafe, selling prescription drugs without requiring a prescription.¹ However, our report also found that the voluntary efforts of internet and payment platforms such as Google, PayPal, and Bing, among other companies, to curb the online promotion of illicit products have disrupted these illicit businesses' operations, specifically by removing the options of paid advertising and the most common payment methods.

Despite these successes, illegal online drug sales persist by finding other corners of the internet, including the dark web. As discussed in Section 5.1 of this report, on the surface web — also called the open internet, or the part of the World Wide Web that is publicly accessible and searchable using standard search engines — illicit pharmaceutical dealers rely on search engine optimization (SEO) and third-party platforms in lieu of paid advertising. Drug vendors also take advantage of anonymous chat forums to find customers, but the most popular of these, reddit.com, has recently seen more scrutiny and enforcement by platform operators. Indeed, the surface web is the battleground of an ongoing struggle between drug vendors looking for outlets to market their wares and those trying to stop them, which makes it more difficult for rogue internet pharmacies to maintain a stable presence on the surface web.

These successes may have pushed illicit drug dealers to the “dark web.” This portion of the internet, which requires specialized software or configurations to access, is built for anonymity and privacy, and as such is the perfect haven for sellers of illicit products. There is a downside for illicit drug dealers, however: prospective customers may be discouraged by technical barriers to entry. The Pennington Institute, a government-backed nonprofit organization in Australia that studies drug use, stated in a February 2018 post that “knowing how to access the dark net and make purchases requires a level of technical competence.”² The article quotes

¹ Our ongoing research indicates that the findings of our 2016 report remain accurate. The number of illicit online pharmacies has held steady at about 35,000, and most of these are blatantly illegal.

² <http://www.pennington.org.au/anexbulletin/out-of-the-darkness-understanding-drugs-and-the-deep-web/>

Roderic Broadhurst, Professor of Criminology at the Australian National University: “You have to be reasonably confident that you can manage the ‘dark arts’ side of it ... Amateurs will not survive very long on there. You need to know how to use a TOR (The Onion Router), and how to use cryptocurrencies to buy drugs. I think it’s often used by middle class, recreational drug users; professionals in cities who might be looking to get cocaine, for example.”

As tighter scrutiny of illicit pharmaceutical dealers on the surface web destabilizes their operations, it is increasingly important not to view the problem of rogue internet pharmacies as solely a surface web problem. Indeed, on the surface web (and in the regulated payment ecosystem where credit card brands and payment providers such as PayPal reside), we know, collectively, how to leverage voluntary action in order to disrupt illicit pharmaceutical sales: domain name suspensions, merchant account terminations, illicit ad blocking, social media profile monitoring, and similar initiatives have proven effective. But different rules exist on the dark web: as more and more illicit pharmaceutical distribution moves to the dark web, what is the right strategy to combat it?

In response to that increasingly important question, this report provides an overview of the dark web, describes how it is used for illicit drug sales, and identifies key vulnerabilities.

1.1. Report Structure

Because many people are unfamiliar with the dark web and how it operates, this report first seeks to describe this portion of the internet and explain the ways in which it differs from the surface web. Our research will present what we call the Four Pillars of Dark Web Commerce — anonymity, cryptocurrency, marketplaces, and reputation — and explain the advantages and drawbacks of each. The analytical section of this report seeks to understand the extent of illicit drug sales on the dark web, the manner in which they are sold, the way in which they are purchased, and the locations from which they are shipped. Finally, we’ll look at the future of the dark web and whether it has the potential to become a significant mainstream outlet for illicit drug sales.

1.2. A Preview of Our Conclusions

Our review of 12 popular marketplaces on the dark web yielded more than 100,000 drug listings, including 8,164 listings for opioids, 6,428 for other prescription drugs, and 7,576 for psychedelics and designer drugs. Top shipping countries (as reported by the

vendors) include the US, Canada, the UK, and other countries in the European Union (EU). Top dark web drug vendors have completed thousands of successful transactions (as indicated by reputational information on the dark web), showing that the number of customers may be limited, but is nevertheless a significant part of the illicit ecosystem.

On one hand, it is important not to overstate the problem of the dark web and credit it with a disproportionately large role in the illicit sale of opioids. After all, the number of opiate transactions we counted on the dark web's primary marketplace amounted to hundreds of thousands over the past few years, which is only a fraction of the more than 11 million Americans who misused prescription pain relievers in 2016 alone, according to a survey by the Substance Abuse and Mental Health Services Administration (SAMHSA).³ Furthermore, the SAMHSA survey indicated that fewer than 5 percent of all opioids misused in the US were obtained via the internet (surface web or dark web).⁴

Even so, marketplaces selling illicit drugs on the dark web pose a real threat to those with the know-how to access it. There appears to be a significantly higher rate of actual delivery of opioids on the dark web as compared to the surface web — that is, many websites on the surface web that purport to be selling opioids are merely ripping people off and not delivering anything; we think this is less true on the dark web.

As the general public becomes more comfortable with specialized software and digital currencies such as Bitcoin, the dark web has the potential to reach larger segments of the population. New peer-to-peer services such as OpenBazaar may remove the middleman and afford illicit operations the best of both worlds: the privacy of the dark web on easily accessible and navigable software.

Although anonymity will continue to provide challenges to law enforcement, this anonymity becomes compromised as soon as physical goods enter into postal services. While domain name enforcement, online advertising restrictions, and traditional payment ecosystem rules will not have general applicability on the dark web, illicit dark web dealers cannot avoid using traditional shipping methods (such as the US Postal Service) to deliver goods to customers — a key vulnerability that must be better exploited.

³ <https://www.samhsa.gov/data/sites/default/files/NSDUH-FFR1-2016/NSDUH-FFR1-2016.pdf> (See page 1.)

⁴ Ibid. (See page 24, Fig 34.)

2. Dark Web Fundamentals

2.1. What Is the Dark Web?

To understand the dark web, it's important to understand all aspects of the World Wide Web, including the surface web and the deep web.

The surface web (also called the clear web and the open web) is what most of us navigate when we check social media, shop online, or read the news. Websites on the surface web are publicly accessible and indexed by search engines such as Google and Bing, permitting internet users to search for them. As of March 2018, this indexed web contains at least 4.52 billion webpages, according to worldwidewebsize.com.⁵ Although the surface web appears enormous, estimates are that it is only a fraction of the content on the web. A common metaphor is to think of the surface web as the tip of an iceberg.

FIG 1: THE WORLD WIDE WEB COMPRISES THE SURFACE WEB, DEEP WEB, AND DARK WEB.



⁵ <http://www.worldwidewebsize.com/>

The deep web comprises any content on the web that is not indexed for search engines and that is accessed by password or encryption, or through gateway software. This includes content such as medical records, legal documents, financial records, and government resources. Because this content cannot be searched and indexed, no one knows exactly how large the deep web is, but many estimates place it at 400 to 500 times larger than the surface web.⁶

The dark web is a subset of the deep web, which is also not indexed by traditional search engines. Unlike the deep web, the dark web functions not only for security but also for anonymity. Its content is intentionally hidden and requires special browsers to access. In addition to illegal activity, the dark web provides a secure space for private communication for people such as political dissidents, whistleblowers, and government agents sharing intelligence. Some estimates place the number of websites on the dark web at 30,000,⁷ though the Dark Web News stated in February 2018 that the number is possibly less than 5,000 after a hacking takedown of Tor webhost Freedom Hosting II.⁸ Wherever the accurate number falls within that range, it is a fraction of a percentage of the total number of websites on the World Wide Web.

2.2. Navigating the Dark Web

The dark web cannot be accessed through traditional web browsers such as Firefox, Chrome, and Safari. Instead, users access websites through software that enables anonymous communication such as Tor and I2P. Tor, the name of which is derived from the acronym of The Onion Router, the original project name, is the most common means of accessing the dark web. The software was first developed in the 1990s as a military project funded by the Defense Advanced Research Projects Agency (DARPA) in the U.S. Naval Research Labs (NRL) as a way for law enforcement to protect their identities on the internet.⁹ Tor consists of volunteer-operated servers that route users

⁶ <https://www.popsci.com/dark-web-revealed>
<http://www.businessinsider.com/difference-between-dark-web-and-deep-web-2015-11>
<https://quod.lib.umich.edu/cgi/t/text/text-idx?c=jep;view=text;rgn=main;idno=3336451.0007.104>

⁷ <http://news.softpedia.com/news/there-are-only-30-000-websites-on-the-dark-web-502725.shtml>

⁸ <https://darkwebnews.com/dark-web/hidden-services-decreased/>

⁹ <https://www.cs.tufts.edu/comp/116/archive/fall2016/cjacoby.pdf>

through randomized virtual tunnels instead of making a direct connection, which can compromise privacy.¹⁰

Tor uses what it calls an Onion Service Protocol, which helps connect users to content.¹¹ The service uses “.onion,” a special top-level domain suffix that directs users to content. It’s important to note that .onion addresses are not real domain name system (DNS) names, and the .onion extension is not in the internet DNS root.¹² Because .onion addresses do not go through the same registration process as traditional domain names, there is no Whois information or other DNS data that can help point to the operator of a website.

2.3. Dark Web Traffic

Because content on the dark web (often called “hidden services”) is not indexed by traditional search engines, and because there is no registration of domain names overseen by a single entity such as the Internet Corporation for Assigned Names and Numbers (ICANN), it’s impossible to give a specific, accurate snapshot of content and traffic. Indeed, this is part of what makes the dark web “dark.”

Hidden services on the dark web are also notoriously slow and unreliable, frequently cycling online and offline multiple times in the same week, or even the same day. A primary reason for this instability is that the dark web is highly decentralized, relying on networks of private servers, which may be something as simple as a person’s old laptop. And because of the way Tor software works — routing users through multiple relays — the experience of navigating hidden services can be painfully slow. In fact, a study conducted at the Department of War Studies at King’s College London in 2016 found that terror- and extremism-related content is low on the dark web partly because it is too slow and frustrating to navigate.¹³

Despite these challenges, some organizations attempt to collect data that may shed at least some light on the dark web. Tor Metrics collects anonymized data on users,

¹⁰ <https://www.torproject.org/about/overview.html.en>

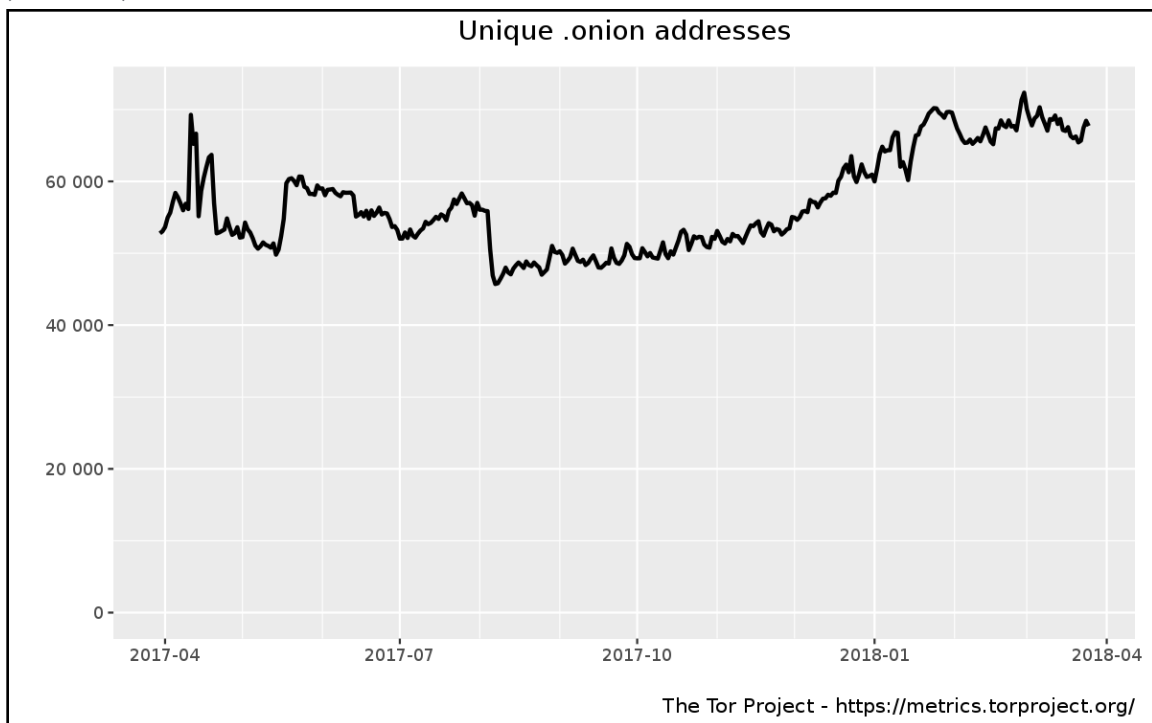
¹¹ <https://www.torproject.org/docs/onion-services.html.en>

¹² <https://www.deepdotweb.com/how-to-access-onion-sites/>

¹³ <https://qz.com/647143/turns-out-the-dark-web-isnt-that-useful-to-global-jihadis-bent-on-terrorism/>

services, and traffic operating through Tor software.¹⁴ Between April 2017 and March 2018, the number of .onion addresses ranged from about 45,000 to about 72,000. As of the writing of this report in late March 2018, the number was about 68,000. This number does not equate to actual websites on the dark web because hidden services often have multiple .onion addresses. (For example, the dark web marketplace Dream Market has 11 .onion addresses.) Many of these websites may also have no content. In early 2015, Tor Metrics estimated that there were about 30,000 hidden services.¹⁵

FIG 2: THE NUMBER OF .ONION ADDRESSES BETWEEN APRIL 2017 AND MARCH 2018 (SOURCE)



The volatility makes it difficult to tell if there is a trend upward. In 2016, .onion addresses spiked to 114,000. Kate Krauss, Director of Communications and Public Policy for the Tor Project, stated that “it’s not difficult for even one person—a researcher, for instance—to create a lot of new onion addresses—which is not the same

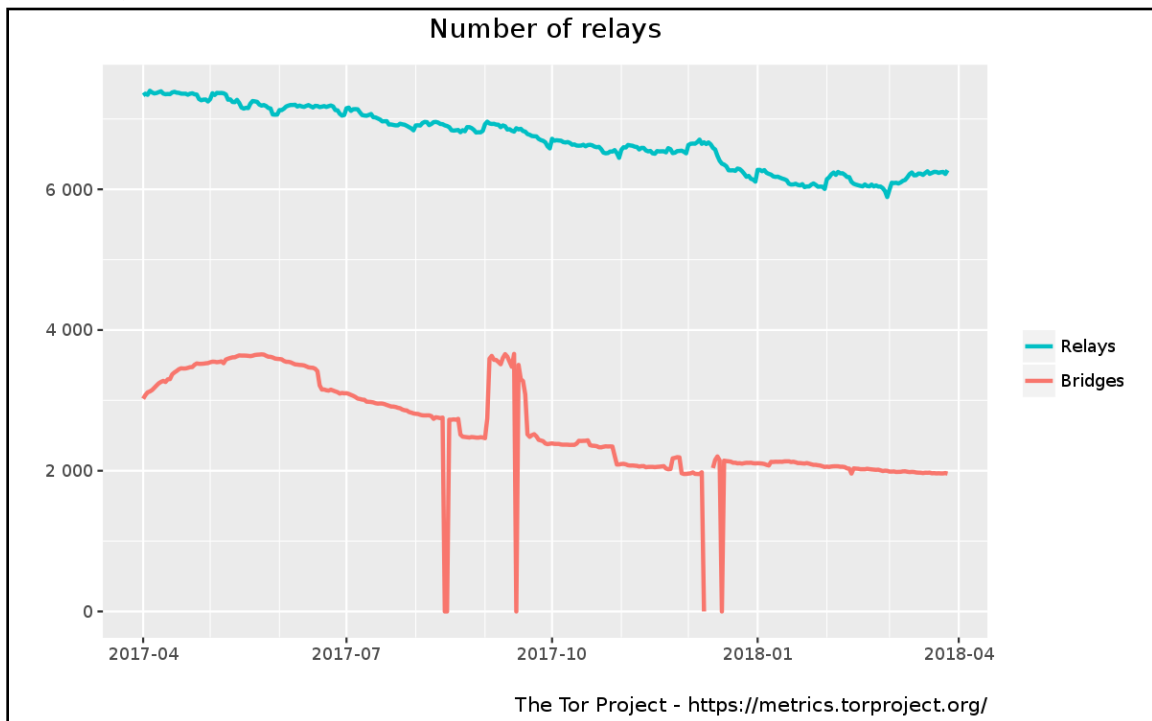
¹⁴ <https://metrics.torproject.org/about.html>

¹⁵ <https://blog.torproject.org/some-statistics-about-onions>

as actual websites or services. In fact, we want the process of creating onion addresses to be as easy as possible to encourage the creation of more onion services.”¹⁶

From April 2017 to March 2018, the number of relays has gone down from more than 7,000 to just above 6,000. A relay is a server or “node” in the Tor network that helps route traffic on behalf of clients.¹⁷

FIG 3: THE TOP LINE SHOWS TOR RELAYS BETWEEN APRIL 2017 AND MARCH 2018. (SOURCE)



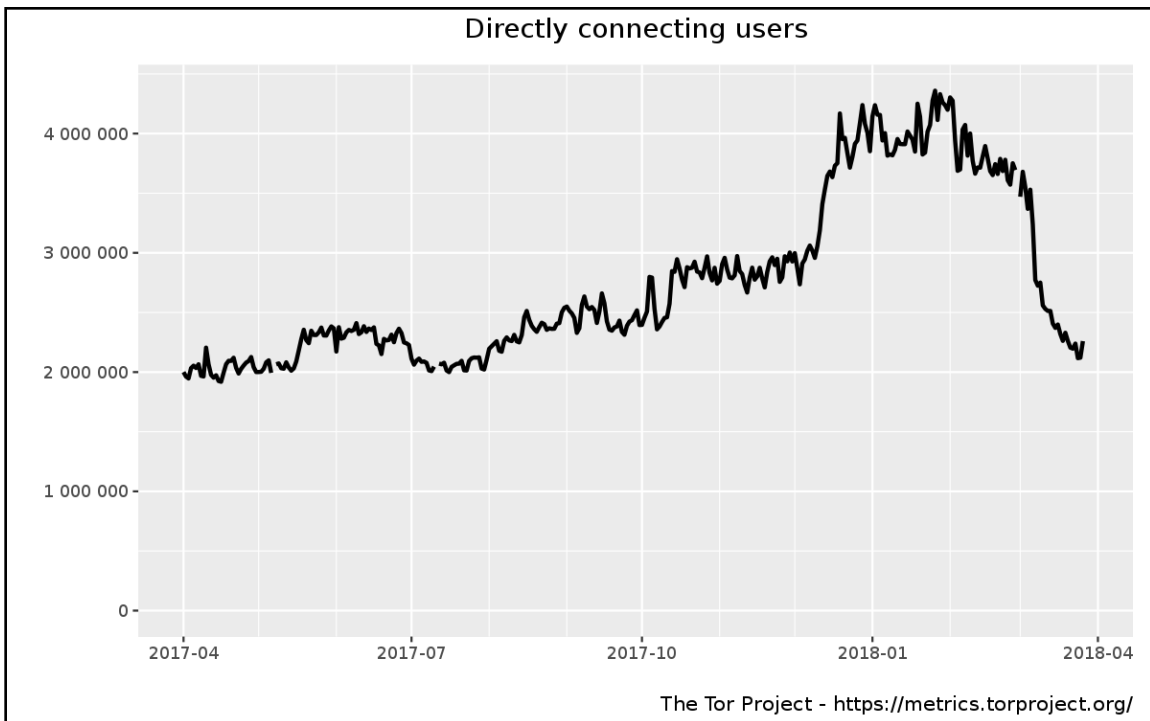
As for the number of users during this same period, Tor Metrics estimated daily usage of anywhere from about 2 million to close to 5 million. The graph on the following page shows the estimated number of directly connecting clients, which are not users in themselves but are nodes in the Tor network typically running on behalf of one user. This data estimates the number of concurrent users, but may not capture distinct users. It is based on an assumption that the average client makes 10 directory requests a

¹⁶ <https://arstechnica.com/information-technology/2016/03/whole-lotta-onions-number-of-tor-hidden-sites-spikes-along-with-paranoia/>

¹⁷ <https://metrics.torproject.org/glossary.html#relay>

day.¹⁸ Therefore, the real number of users may be higher or lower. It may be significant to note that, although volatile, the estimated number of average daily users has not changed significantly since 2014.¹⁹

FIG 4: THE NUMBER OF DIRECTLY CONNECTING CLIENTS (USERS) BETWEEN APRIL 2017 AND MARCH 2018 (SOURCE)



Furthermore, Tor Metrics estimated in 2015 that only about 3.4 percent of Tor traffic is for hidden services.²⁰ (Most users appear to use the Tor browser for privacy on the surface web.) Even if we take a number at the high end — say, 5 million unique Tor users every day — that would mean about 170,000 people accessing the dark web daily.

¹⁸ <https://gitweb.torproject.org/metrics-web.git/tree/src/main/resources/doc/users-q-and-a.txt>

¹⁹ <https://metrics.torproject.org/userstats-relay-country.html?start=2014-04-01&end=2018-05-01&country=all&events=off>

²⁰ <https://blog.torproject.org/some-statistics-about-onions>

3. Four Pillars of Dark Web Commerce

E-commerce on the dark web may in some ways look like e-commerce on the surface web, but there are underlying principles that make transacting on the dark web unique. LegitScript thinks of these as the Four Pillars of Dark Web Commerce. These principles help to preserve anonymity and foster trust in an ecosystem rife with fraud. It's important to understand how commerce on the dark web functions to understand the benefits and drawbacks of buying and selling drugs on the dark web.

3.1. Anonymity

As we stated in Section 2.1, the dark web differs from the deep web in that its primary goals are to hide content and provide anonymity. In addition to Tor, which routes users through multiple relays in an effort to obfuscate a user's identity, most dark web users employ a virtual private network (VPN).²¹ The purpose of a VPN is to create a secure "tunnel" for sending and receiving data across shared or public networks by configuring their computing devices as if they were directly connected by a private network. These are only the most basic forms of security that users of the dark web employ; depending on a user's privacy needs, it can get much more complex.²²

Once on the dark web, users often maintain their anonymity by communicating through Pretty Good Privacy (PGP), a type of software that encrypts messages.²³ This makes it difficult for anyone who intercepts a message to read it unless they have a private key to "unlock" it. In this way, buyers and sellers can communicate without revealing their identities (that is, until a product must be physically mailed).

Finally, dark web customers can protect their identities by "tumbling" or "mixing" their cryptocurrencies. This form of money laundering uses a third-party service to sever the connection between a cryptocurrency address sending coins and the address to which they are sent.²⁴ This is particularly relevant for Bitcoin (BTC) and other blockchain-based cryptocurrencies, whose transactions are trackable.

²¹ <https://www.techradar.com/news/what-is-a-vpn>

²² <https://darkwebnews.com/vpn-anonymity-tool/>

²³ <https://ssd.eff.org/en/module/introduction-public-key-cryptography-and-pgp>

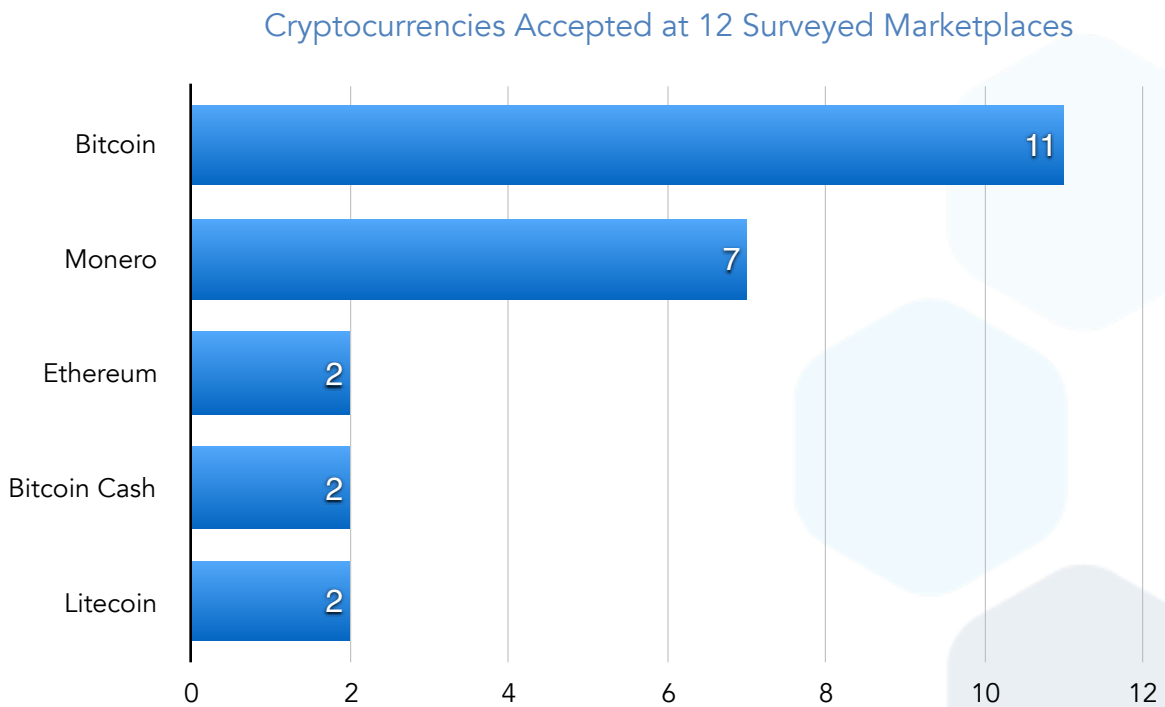
²⁴ <http://cryptocurrencytumbler.com/>

3.2. Cryptocurrencies

It’s impossible to divorce dark web commerce from cryptocurrencies. These digital assets allow buyers and sellers to transact online in ways that would otherwise be impossible. Sending cash through mail is not a viable option, and card brand rules make it a violation to use credit for the types of products and services sold on the dark web.

Bitcoin, the first decentralized digital currency, is currently the dark web standard (11 of the 12 marketplaces we surveyed accept it). This cryptocurrency works by using blockchain, a distributed public ledger that records Bitcoin transactions.²⁵ This safeguards against duplication or tampering with the currency, but it also creates a public record that can potentially compromise a buyer’s or seller’s anonymity. It’s for this reason dark web users sometimes launder or “tumble” their Bitcoins.

FIG 5: BITCOIN IS THE MOST COMMONLY ACCEPTED DARK WEB CRYPTOCURRENCY.



²⁵ <https://blockgeeks.com/guides/what-is-blockchain-technology/>

Scores of other cryptocurrencies (sometimes called “altcoins”) exist, but only a few are popular on the dark web.²⁶ Occasionally accepted altcoins on the dark web include Ethereum²⁷ (ETH) and Litecoin (LTC),²⁸ both blockchain-based digital assets, and Monero (XMR), which has become especially popular with dark web users because it offers privacy protection that is better than Bitcoin (but not absolute).²⁹ Bitcoin Cash (BCH) is an offshoot of Bitcoin created as a way to scale the currency.³⁰

Buying cryptocurrency is similar to a traditional money exchange in that it requires a third party that changes the money for a fee. Cryptocurrency exchangers such as Coinbase and Kraken allow users to create an account, link a credit card or bank account, and then make purchases of many different kinds of cryptocurrencies.³¹ Those who possess cryptocurrency must have a cryptocurrency wallet to store their purchases, and there are dozens of companies that offer this service for a minimal fee. According to a study by the University of Cambridge, the number of unique active users of cryptocurrency wallets in 2017 was estimated to be between 2.9 million and 5.8 million.³² This gives a rough estimate of the amount of people using (or at least storing) cryptocurrency.

3.3. Marketplaces

Dark web commerce operates largely on marketplaces that function similarly to surface web third-party marketplaces such as eBay and Amazon. Although there are scores of marketplaces purporting to offer drugs, weapons, counterfeit items, and other illegal products, the trend is for one marketplace to dominate dark web commerce. Silk Road became the central dark web marketplace in 2011.³³ When it was seized by the FBI in 2013, Silk Road 2.0 emerged as the dominating marketplace before being shut down in

²⁶ <https://coinmarketcap.com/all/views/all/>

²⁷ <https://www.ethereum.org/>

²⁸ <https://litecoin.org/>

²⁹ <https://www.wired.com/story/monero-privacy/>

³⁰ <https://www.bitcoin.com/info/differences-between-bitcoin-cash-bch-and-bitcoin-btc>

³¹ <https://lifehacker.com/how-to-buy-cryptocurrency-1821935329>

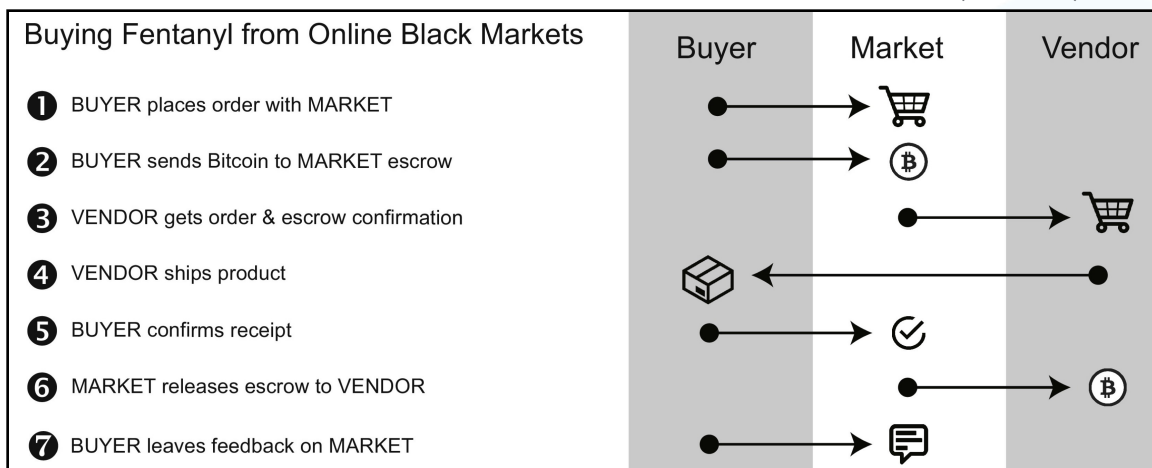
³² https://www.jbs.cam.ac.uk/fileadmin/user_upload/research/centres/alternative-finance/downloads/2017-global-cryptocurrency-benchmarking-study.pdf

³³ <https://blockonomi.com/history-of-silk-road/>

2014 in an international effort dubbed Operation Onymous.³⁴ Evolution then became the leading marketplace before engaging in an exit scam in 2015 (see Section 3.4),³⁵ and was then replaced by Agora, which halted operations as a result of attacks to de-anonymize its server locations. The rise and eventual capture by law enforcement of AlphaBay and Hansa³⁶ paved the way for the current leader, Dream Market.

Unlike the surface web, a primary function of these dark web marketplaces is to serve as escrow agents between the buyer and the seller, for which the marketplace collects a small fee. Escrow helps to prevent seller fraud (see Section 4.3 for more on this) and preserves the anonymity of purchases because marketplaces typically tumble the buyer’s cryptocurrency in the process. Most marketplaces use a technology called multi-signature transactions (usually called “multisig”) that requires the approval or “signature” of multiple parties in a transaction before payment is released from escrow.³⁷ 2-of-2 multisig requires both the buyer and seller to sign off before money is released. An increasingly popular option is 2-of-3 multisig, in which two of three parties engaged in a transaction (buyer, seller, and escrow agent) must sign off to release funds.

FIG 6: PROCESS OF BUYING DRUGS THROUGH A DARK WEB MARKETPLACE (SOURCE)



Marketplaces are notoriously unstable, in part because of what may be subpar technology (as we talk about in Section 2.3) and in part because of distributed denial-

³⁴ <https://www.europol.europa.eu/newsroom/news/global-action-against-dark-markets-tor-network>

³⁵ <https://krebsonsecurity.com/tag/evolution-exit-scam/>

³⁶ <https://www.bbc.com/news/technology-40670010>

³⁷ <https://99bitcoins.com/multisig-a-beginners-guide/>

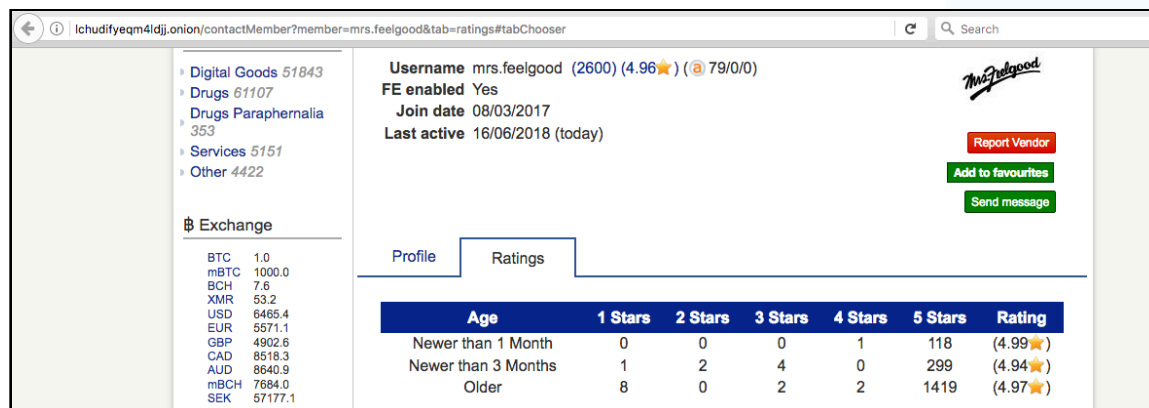
of-service (DDoS) attacks that can often take large portions of the Tor network offline.³⁸ There are many surface web websites devoted to tracking the status of whether marketplaces are up or down.³⁹ Most marketplaces offer multiple .onion addresses that mirror the main website in the event it goes down.

In the absence of search engines on the dark web, marketplaces turn to the surface web for visibility. Websites such as Reddit and The Hidden Wiki list popular .onion addresses,⁴⁰ and informational websites such as Dark Web News and DeepDotWeb list popular marketplaces and give instructions about how to navigate them.⁴¹

3.4. Reputation

The anonymity of the dark web makes it ripe for scams, which is why vendor reputation is another pillar of dark web commerce. Customers leave vendor reviews in the same way they might on clear web e-commerce websites such as Amazon or eBay. However, reputation scores take on additional relevance because there is little recourse in the event of fraud. Buyers who receive illegal substandard products do not typically turn to law enforcement or other regulatory agencies; their one course of action is to leave a poor review and hope it damages the vendor's reputation.

FIG 7: A REVIEW DIGEST FOR VENDOR MRS.FEELGOOD ON DREAM MARKET



³⁸ <https://darkwebnews.com/darknet-markets/ddos-attacks-on-tor/>

³⁹ <https://www.deepdotweb.com/dark-net-market-comparison-chart/>

⁴⁰ <https://www.reddit.com/r/DarkWebLinks/>
<https://thehiddenwiki.org/>

⁴¹ <https://www.deepdotweb.com/2013/10/28/updated-list-of-hidden-marketplaces-tor-i2p/>
<https://darkwebnews.com/dark-web-market-list/>

It's not only vendors who earn a reputation, but the marketplaces themselves. Former marketplaces have engaged in "exit scams" in which marketplace operators collect escrow funds and then shut down their marketplaces and disappear with the money, sometimes worth millions of dollars.⁴² The largest known exit scam is Evolution marketplace, which abruptly shut down in 2015 and whose operators absconded with \$15 million worth of Bitcoins.⁴³ When AlphaBay, the dominate marketplace at the time, was shut down by law enforcement in July 2017,⁴⁴ there was wide speculation that its operators had engaged in what would have been a massive exit scam.⁴⁵

Some surface web websites track and review dark web marketplaces, rating them by factors such as whether they have had security issues or active warnings, whether they offer security technology such as multisig and two-factor authentication, and whether they have proven reliable and trustworthy.

FIG 8: A DARK WEB MARKETPLACE COMPARISON CHART (SOURCE)

Market	Uptime Status	URL	Open registration?	Offers Multisig?	Had Security Issues?!	Active warnings	Commission	Vendor Bond	2FA	Forced Vendor PGP	FE Allowed?	Type	Ratings	Created
Dream Market	98.14% ↑	http://5gc3hz66ulfzgwu.onion/?ai=1675	Open	✗	⊖	None	4%	300\$	✓	✗	Yes	Market	★★★★☆ 4.03 (1674 REVIEWS)	15-11-13
Wall Street Market	97.43% ↑	http://wallst4qihu6lvs.a.onion/signup?ref=276	Open	✓	⊖	None	2-5% -5%	80\$ - Free For Trusted	✓	✓	lvl3 Vendors	Market	★★★★☆ 4.25 (152 REVIEWS)	19-10-16
Tochka	91.12% ↑	http://pointgg344ghbo2s.onion/auth/register/563636d36ab740e4720f44e8328441d3	Open	✓	⊖	None	2% - 10%	?	✓	✓	Yes	Market/Local	★★★★☆ 3.75 (160 REVIEWS)	30-1-15
Olympus Market	99.63% ↑	http://xc7oyzq4cz3k17sa.onion/signup/MATQP3	Open	✓	⊖	None	4%	250\$	✓	✓	Partially Allowed	Market	★★★★☆ 3.89 (19 REVIEWS)	1-1-18
Rapture Market	93.94% ↑	http://zslonvz2kftt1pv3.onion/?r=9p485	Open	✓	⊖	None	4%	200\$	✓	✓	Trusted Vendors Only	Market	★★★★☆ 3.98 (20 REVIEWS)	18-1-18
The Majestic Garden	96.07% ↑	http://talismanrestz7mr.onion/	Open	✗	⊖	None	Donations	By invite	✗	✗	Yes	Forum	★★★★☆ 3.50 (13 REVIEWS)	?
CGMC	94.87% ↑	http://cgmcoopwhe1mpo6a5.onion/	Invite Only	✓	⊖	None	2% - 3%	None	✓	✓	No	Market	★★★★☆ 4.69 (67 REVIEWS)	7-6-2016

⁴² <https://darkwebnews.com/?s=%22exit+scam%22>

⁴³ <https://www.deepdotweb.com/2015/03/18/evolution-marketplace-exit-scam-biggest-exist-scam-ever/>

⁴⁴ <https://www.theverge.com/2017/7/14/15975140/alphabay-dark-web-drug-marketplace-police-shutdown-silk-road>

⁴⁵ <http://nymag.com/selectall/2017/07/alphabay-exit-scam-may-be-the-biggest-one-yet.html>

4. Sector Analysis

4.1. Methodology

By its nature, collecting reliable data on the dark web is difficult. There are no search engines reliably indexing dark web content; there is no Whois data or other DNS information to unveil operators and detect networks; and there are no visible IP addresses to help determine the locations of marketplace operators. For this report, LegitScript collected data on top dark web drug marketplaces, as determined by the frequency with which they appeared on surface web directories such as Dark Web News, DeepDotWeb, and Reddit (see Section 3.3). We compiled a list of about 240 marketplaces selling drugs on the dark web, but we note that many of these marketplaces were either offline at the time of our research in February 2018 and March 2018 or were extremely limited in their product offerings.

LegitScript focused on 12 top marketplaces that sold drugs, including opioids, and were generally online during our research. From these marketplaces we collected data by hand, counting the number of drug listings, the types of drugs sold, the number of vendors for certain opioid products, and the locations from which vendors state they are shipping. **Our data and analysis indicate that dark web commerce is concentrated in a handful marketplaces and that one in particular, Dream Market, currently dominates dark web drug commerce.**

FIG 9: THE 12 DARK WEB MARKETPLACES SURVEYED BY LEGITSCRIPT

Marketplace	Primary .onion Address	Drug Listings	Opiate Listings
Dream Market	http://lchudifyeqm4ldjj.onion	58,382	4,204
Valhalla	http://valhallaxmn3fydu.onion	13,176	1,008
Tochka	http://tochka3evlj3sxdv.onion	8,934	1,691
Berlusconi Market	http://hky3mzk3jtm4zt4.onion	6,389	244
Wall Street Market	http://wallstyizjhkrvmj.onion	3,934	338
Olympus Market	http://olyymm2ravxnnf2hm.onion	2,988	139
Zion Market	http://zionshopusn6nopy.onion	2,546	173

Marketplace	Primary .onion Address	Drug Listings	Opiate Listings
Drug Market	http://4yjes6zfcuh7vcj.onion	2,303	83
Libertas Market	http://libbyxh6som2twgp.onion	1,836	71
Empire Market	http://empiremktxgjobvm.onion	1,748	209
Silk Road 3	http://silkroad7rn2puhj.onion	~1,700	~233
Apollon Market	http://apollionih4ocqyd.onion	149	1
Total		104,085	8,394

Of the marketplaces we surveyed, Dream Market had 56.1 percent of the total drug listings and 50.2 percent of the total opiate listings. The next closest marketplace, Valhalla, had 12.6 percent of the total drug listings and 12 percent of the total opiate listings. Because Dream Market has such a dominating influence — controlling more than half of the listings on these top 12 marketplaces — we focused our research there.

In addition to opioids, LegitScript collected data for listings on other prescription drugs, psychedelic and designer drugs, cannabis products, and ecstasy and empathogens.

FIG 10: DRUG LISTINGS BROKEN DOWN BY DRUG TYPE

Total Listings	Opioids	Prescription	Psychedelics	Cannabis	Ecstasy
104,085	8,394 (8.1%)	6,588 (6.3%)	7,697 (7.4%)	26,887 (25.8%)	17,724 (17%)

Opioids, prescription drugs, and psychedelics comprise a small share of the listings we surveyed (21.8 percent combined). Cannabis and ecstasy products had the greatest number of listings. These numbers are consistent with a 2015 survey that showed cannabis and MDMA as the drugs most frequently purchased on the dark web.⁴⁶

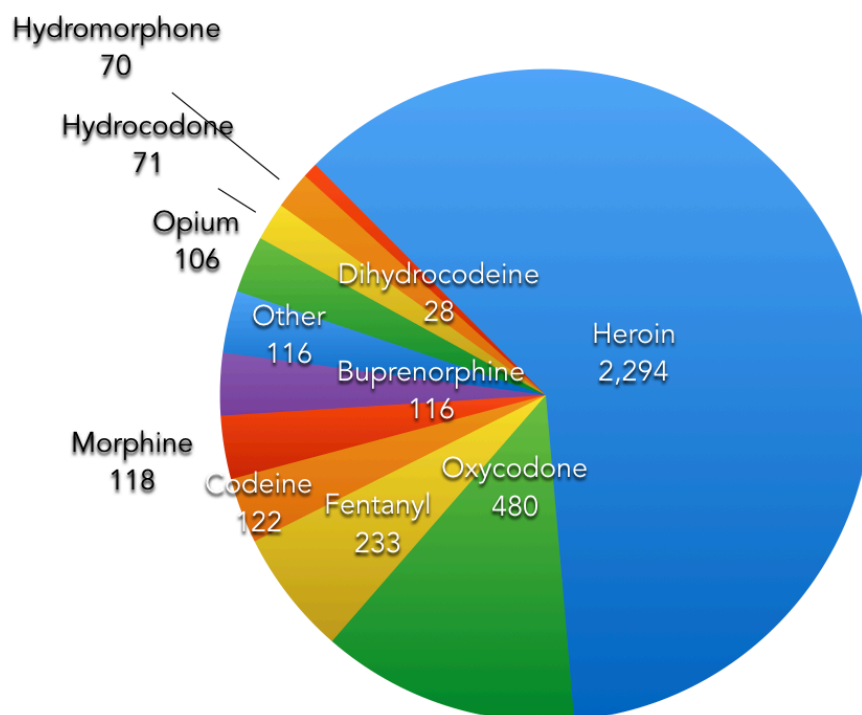
Other categories included benzodiazepines, dissociatives, steroids, and stimulants. Not all surveyed marketplaces offered these products, and we did not analyze their listings.

⁴⁶ <https://www.theguardian.com/society/datablog/2015/jun/08/global-drug-survey-2015-buy-online-darknet-silk-road>

4.2. Product Statistics

On most marketplaces, the opioids category is broken down into subcategories. In March 2018, Dream Market offered 11 subcategories, the largest of which was heroin:

FIG 11: OPIATE LISTINGS ON DREAM MARKET BY SUBCATEGORY

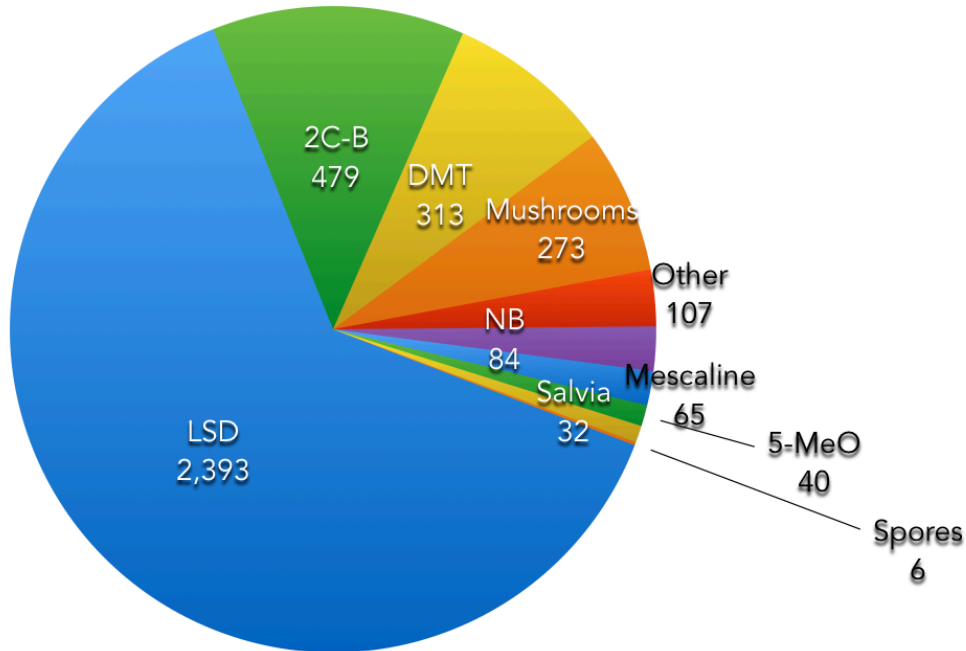


Heroin comprised 54.6 percent of the opiate listings on Dream Market. The next two largest subcategories, oxycodone and fentanyl, comprised 11.4 percent and 5.5 percent, respectively. Nine of the 12 marketplaces we surveyed broke opioids into subcategories. Of these, heroin was the most prevalent opiate listing in seven. Oxycodone was the second most prevalent opiate listing in four of these nine marketplaces, and was first in one. However, we note that all these numbers are small in comparison to Dream Market.

Prescription drugs on Dream Market are divided into only two subcategories: relaxants and stimulants. Of 2,468 prescription drug listings, 837 (33.9 percent) were classified as stimulants and 213 (8.6 percent) were classified as relaxants. Those not sub-classified fell into neither category, such as erectile dysfunction drugs.

Of the 3,935 psychedelic drug listings, 2,393 (60.8 percent) were listed as LSD. Please see the pie chart on the following page.

FIG 12: PSYCHEDELIC DRUG LISTINGS ON DREAM MARKET BY SUBCATEGORY



Although Dream Market has thousands of opiate listings, the number of vendors appears to be considerably smaller. We reviewed all fentanyl listings (233) on the marketplace and counted 34 vendors selling the product. Most of these vendors had only one or two listings. The top five vendors had 133 (57 percent) of the listings.

FIG 13: TOP FENTANYL VENDORS ON DREAM MARKET BY NUMBER OF LISTINGS

Vendor Username	Fentanyl Listings	Alleged to Ship From	Successful Transactions	Customer Rating (out of 5)
cdnven	45	Canada	1,400	4.88
HappyDrugs	29	EU	1,550	4.86
mafision	24	Slovakia	80	4.69
The-Wired	19	China	480	4.80
TheDarkHorse	16	Hong Kong	210	4.72

LegitScript identified eight fentanyl vendors on Dream Market who had 1,000 or more successful lifetime transactions. We note that not all vendor transactions are for opioids.

FIG 14: TOP FENTANYL VENDORS ON DREAM MARKET BY NUMBER OF TRANSACTIONS

Vendor Username	Transactions	Ships From	Customer Rating
A1CRACK	6,000	UK	4.92
MR.HOTSAUCE	2,450	Canada	4.95
MH4Life	1,900	US	4.91
TRAPGOD	1,700	US	4.82
ELHEFE	1,700	US	4.87
HappyDrugs	1,600	Europe (country unspecified)	4.86
HeinekenExpress	1,600	Europe (country unspecified)	4.82
cdnven	1,600	Canada	4.88

We counted about 300 vendors purporting to sell opioids on Dream Market, and the majority of these marketed heroin. As of early May 2018, the number of transactions for these vendors totaled about 375,000 since the inception of Dream Market, which has been active since late 2013.⁴⁷ We note that many vendors purport to sell other drugs in addition to opioids, and Dream Market does not parse transaction data by product type, so the total opiate transactions on Dream Market may be less than 375,000.

4.3. Dark Web Schemes

In addition to exit scams (see Section 3.4), we sought to determine whether there were other common dark web schemes to defraud. Phishing — an attempt to obtain and exploit sensitive information — is common enough on the dark web that most marketplaces list notices on their homepages, warning users not to follow links posted in customer reviews or in forum comments. One technique scammers employ is to direct users to websites designed to look like well-known marketplaces to trick users into entering their login information.⁴⁸

⁴⁷ <https://www.deepdotweb.com/marketplace-directory/listing/dream-market/>

⁴⁸ <https://darkwebnews.com/darkwebmarkets/dream-market/dream-market-a-hotbed-of-scammers/>

Illicit e-commerce frequently draws vendors who engage in nondelivery schemes, in which sellers receive payment for products they never send. Although this appears to be less of a problem than on the surface web, nondelivery can still occur on the dark web, particularly from vendors targeting inexperienced buyers and from scammers collaborating with operators of the marketplaces themselves.⁴⁹ We found only anecdotal evidence of nondelivery in customer reviews.

FIGS 15 AND 16: TWO CUSTOMERS ACCUSE A DREAM MARKET VENDOR OF NONDELIVERY.



Highly rated vendors have occasionally been accused of “selective scamming” in which they send products to most customers but intentionally don’t deliver to some. We were unable to confirm whether this is an actual scheme or whether products may be getting intercepted in the mail.

FIG 17: DREAM MARKET VENDOR TRAPGOD ACCUSED OF SELECTIVE SCAMMING



The use of escrow appears to significantly reduce the likelihood of nondelivery schemes on the dark web. Marketplace operators are motivated to remove scammers from their platform to build trust and maintain a good reputation. Dream Market states a no-tolerance policy for scammers in its buyers guidelines:

“Scammers are not tolerated and are quickly identified as such. As a buyer you can look out for a ‘trusted vendor’ label. Vendors with this label have an advanced trusted status, which means they have proven to be trustworthy and they have a long history of successful transactions and positive buyer relations.”

⁴⁹ Ibid.

Trusted vendors on Dream Market have the option of requesting “finalize early” (FE) transactions, in which they can ask for payment to be released from escrow before customers have received their packages.

The most common complaints in customer reviews appeared to be for substandard products. Customers complained about poor pill pressing and indiscreet packaging, but the most common complaints we viewed were about weak potency. Buyers typically appear to know that the products they purchase are not name brand.

FIG 18: DREAM MARKET VENDOR OXYGOD ACCUSED OF SELLING A WEAK PRODUCT

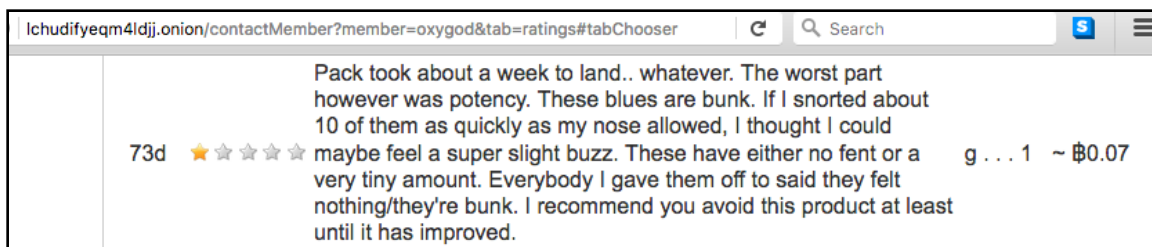
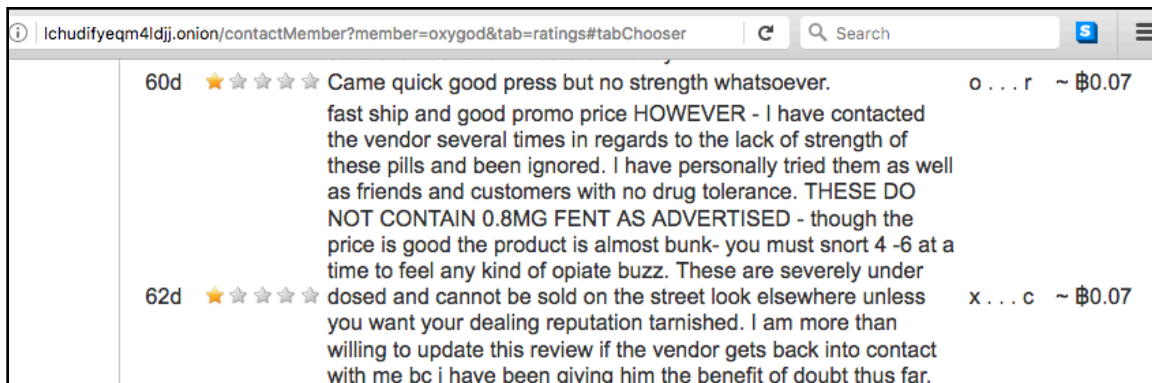


FIG 19: VENDOR OXYGOD ACCUSED OF SELLING A WEAK OR COUNTERFEIT PRODUCT



It is unclear to LegitScript whether products such as these are intentionally weak or counterfeit, or if the vendor has unintentionally produced a substandard product.

In 2016, the DEA made purchases from four vendors on Dream Market and received verified controlled substances from each, all of which were shipped through United States Priority Mail, according to a criminal complaint filed by the DEA in August 2017.⁵⁰ This supports the idea that purchases made from the dark web are more likely to result in the shipment of actual products than the surface web.

⁵⁰ <https://www.courtlistener.com/recap/gov.uscourts.flstd.513308.1.0.pdf> (See pages 9 and 10.)

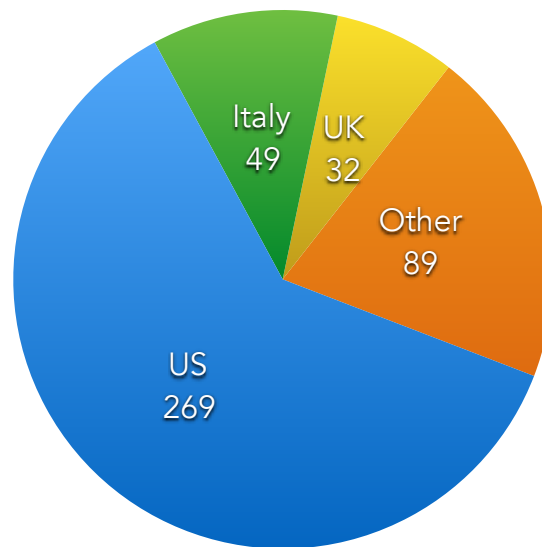
4.4. Source of Shipping

Most Dream Market vendors list the jurisdiction from which they ship. We were unable to independently verify this information.

Of 4,204 opioid listings, 3,411 state that shipping is available to the US. We collected a sampling of these listings (438, or 12.8 percent) to see where the drugs are shipping from. Of our sample set, 181 (41.3 percent) of the listings stated they shipped from The Netherlands. The second-largest shipping country was the US, with 131 listings (29.9 percent). Other major shipping jurisdictions include the UK with 7.7 percent, the EU (no country specified) with 6.4 percent, and Canada with 5 percent. We note that the vast majority of listings from The Netherlands appear to be for heroin.

We looked at shipping for three top opioids aside from heroin: oxycodone, fentanyl, and morphine. Out of 482 oxycodone listings, 439 offered US shipping. The top countries offering US shipping (as reported by vendors) were the US, Italy, and the UK.

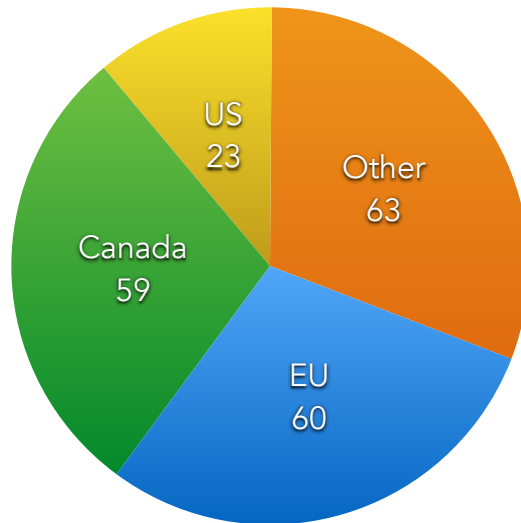
FIG 20: DREAM MARKET VENDOR SHIPPING ORIGINS FOR OXYCODONE



Of 233 fentanyl listings, 205 offered shipping to the US. The top three jurisdictions offering shipping to the US were the EU (country unspecified), Canada, and the US. We were unable to verify the source of supply, but federal research indicates that most

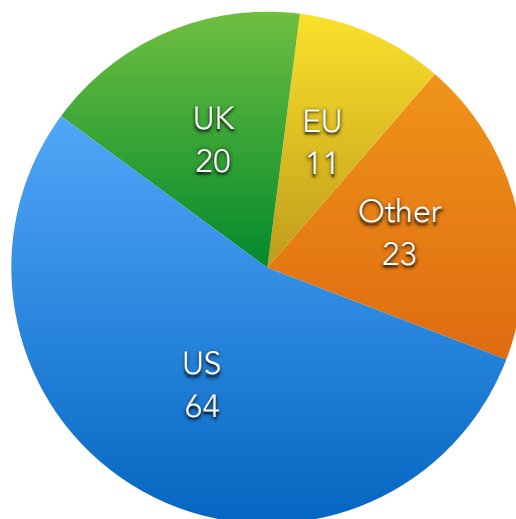
fentanyl and fentanyl analogues originate from China, often entering the US directly or through Mexico, and less frequently through Canada.⁵¹

FIG 21: DREAM MARKET VENDOR SHIPPING ORIGINS FOR FENTANYL



Of 118 morphine listings, 106 offered shipping to the US. The top three jurisdictions offering shipping to the US (as reported by the vendors) were the US, the UK, and the EU (country unspecified).

FIG 22: DREAM MARKET VENDOR SHIPPING ORIGINS FOR MORPHINE



⁵¹ https://www.uscc.gov/sites/default/files/Research/USCC%20Staff%20Report_Fentanyl-China's%20Deadly%20Export%20to%20the%20United%20States020117.pdf (See pages 5-8.)

Consistent with the table in Figure 13, it appears that the US, UK, EU, and Canada are primary shippers of non-heroin opioids.

One of the greatest challenges in studying dark web drug sales is in determining the source of supply. Aside from anecdotal descriptions in listings (e.g., “the best Turkish heroin”), we were unable to identify where products are manufactured. Some of the vendors we researched stated that they press their own pills, but they did not state where they source their raw ingredients. A 2017 DEA report indicates that illicit opioid dealers in the US source their materials from China or Mexico and press it into counterfeit pills.⁵² Some raw materials may be obtained in bulk through surface web B2B platforms (see Section 5.3.2).

For this report, we did not conduct test buys (purchases of drugs from the dark web). Product packaging and mailing information can sometimes give clues to not only the shipping origins but also the sources of supply.

4.5. The Changing Dark Web Landscape

The dark web marketplace landscape is dynamic and turbulent, in part a result of external factors (e.g., law enforcement raids, DDoS attacks) and in part because of internal factors (e.g., exit scams, policy changes).⁵³

In mid-May 2018, after LegitScript’s period of research, Dream Market began banning the sale of fentanyl and fentanyl analogues.⁵⁴ The category listing for the drug disappeared from the navigation sidebar, though other opiate categories remained, including heroin and oxycodone. Despite the policy change, we were able to identify fentanyl products still being sold on the platform by performing a search for fentanyl or its analogues. See the image on the following page. Furthermore, we note that The Partnership for Safe Medicines and the Centers for Disease Control and Prevention reported an increase of fentanyl appearing in non-fentanyl opioids as well as non-opioid

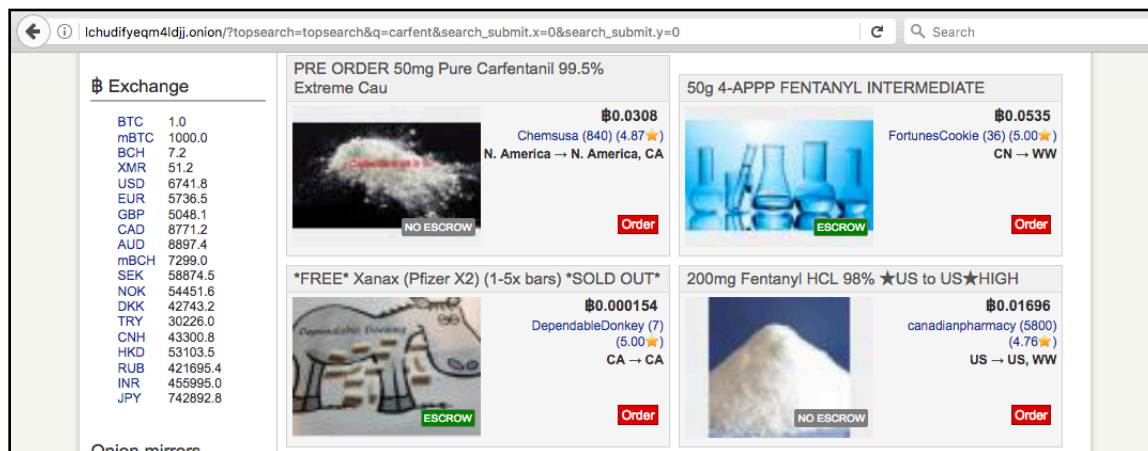
⁵² https://www.dea.gov/docs/DIR-040-17_2017-NDTA.pdf (See page vi.)

⁵³ <https://www.cyberscoop.com/dark-web-ddos-attacks-dream-market-wall-street-market/>

⁵⁴ <https://www.deepdotweb.com/2018/05/30/will-dream-markets-fentanyl-ban-save-lives/>

recreational drugs.⁵⁵ Therefore, a ban on fentanyl products may not eliminate the drug from a platform offering other illicit drugs.

FIG 23: FENTANYL PRODUCTS LISTED ON DREAM MARKET AFTER THE FENTANYL BAN



In September 2017, the DEA arrested Gal Vallerius, a French national suspected of being the Dream Market vendor OxyMonster, who also operated as an administrator and forum moderator on the platform. In June 2018, Vallerius pled guilty to narcotics trafficking and money laundering, and faces up to 20 years in prison.⁵⁶ The quantity of drugs in the offense included more than 90 kilograms of heroin, more than 450 kilograms of cocaine, more than 25 kilograms of cocaine base (crack), more than 45 kilograms of methamphetamine, more than 13.5 kilograms of oxycodone, more than 900 kilograms of Ritalin, and more than 36 kilograms of fentanyl.⁵⁷

Other suspected Dream Market vendors were arrested in mid-2018, including four men in Canada accused of operating the fentanyl vendor account Mr.Hotsauce, which is referenced in this report.⁵⁸ Three men in the UK admitted to operating the fentanyl vendor profile UKBargains, which operated first on AlphaBay and then on Dream Market.⁵⁹

⁵⁵ <https://www.safemedicines.org/policymakers-media/fentanyl-pills-ravaging-american-communities>
<https://www.cdc.gov/media/releases/2017/s1027-fentanyl-deaths.html>

⁵⁶ <https://www.courtlistener.com/recap/gov.uscourts.flstd.513308/gov.uscourts.flstd.513308.49.0.pdf>

⁵⁷ Ibid. (See pages 3 and 4.)

⁵⁸ <https://www.deepdotweb.com/2018/06/11/canadian-police-bust-massive-dream-vendor-mr-hotsauce/>

⁵⁹ <http://www.nationalcrimeagency.gov.uk/news/1367-organised-crime-group-mixed-potentially-lethal-drug-fentanyl-and-posted-it-around-the-world>

5. Surface Web Drug Sales

Although individual websites may go offline or come online at any given time, LegitScript estimates that the total number of active illicit online pharmacies operating on the surface web has held steady at about 30,000 to 35,000. We consider online pharmacies to be illicit when they fail to require a prescription for prescription-only drugs, dispense drugs in jurisdictions in which they are not licensed, or sell or purport to sell drugs that are unapproved for sale in the jurisdictions where they offer shipping. Our 2016 report found that about 9 percent of these illicit pharmacies purport to sell controlled substances. Of these, a minority are selling opioids.

5.1. Paid Services

In March 2018, LegitScript conducted a sweep of paid advertising on Google and Bing using more than 20 search terms related to the purchase of opioid products (e.g., “buy fentanyl” and “buy oxycodone”). Over a two-day period, the sweep collected 49 URLs, many of which were repeats or similar webpages of the same website. Once we removed these, 16 websites remained. Most of these were either verified legitimate pharmacies or informational healthcare-related websites, such as CSIP’s verifybeforeyoubuy.org. Two websites were not certified by LegitScript, but did not appear to us to be operating illicitly. One was a US pharmacy that appeared in a keyword search for methadone, though it did not appear to be selling the drug. The other US pharmacy appeared in a keyword search for codeine, and the link directed to a webpage for a non-codeine cough medicine that is legal to sell in the US. From a review of these two websites, we were unable to identify the illicit sale of opioids or other prescription drugs. In short, the paid advertising space remains clean.

Some of the sweep results included URLs to products listed on Amazon and eBay. These linked to legal, non-drug products, such as medical accessories or pharmaceutical reading materials. The results of our sweep indicate that the amount of advertising for illicit opioids on major search engines is functionally zero.

5.2. Organic Searches

In the absence of paid services, operators of illicit online pharmacies may look for other ways to market their businesses. LegitScript regularly searches the internet for illicit

online pharmacies and sometimes performs “test buys” in an attempt to see if a transaction from a website will process. In the past year, LegitScript has conducted approximately 600 test buys, 33 of which were from websites selling opioids (5.5 percent).

Of the 33 opioid-related test transactions, the most common product for which we completed a transaction was tramadol, but we also successfully completed transactions for oxycodone.⁶⁰ Thirty-two of these 33 websites appeared to be engaged in transaction laundering, which involves the use of a merchant account of a seemingly innocuous business to process payments. There were 18 different merchant category codes (MCCs) used by these 33 illicit online pharmacies for transaction laundering. Top categories included management and consulting, cosmetics stores, computer programming and design, and health and beauty spas. Because we used a credit card set to decline and did not actually receive products, it is difficult to tell how many may be nondelivery schemes. However, based on our experience with the networks to which these websites are connected, as well as some website characteristics that are common to nondelivery schemes, we believe many may not actually ship products. This is different from the dark web, where we believe both the use of escrow and the emphasis placed on vendor reputation yield a higher percentage of actual product delivery.

From our own research, LegitScript is aware of dozens of surface web networks operating (collectively) hundreds of illicit online pharmacy websites that market opioids.

FIG 24: TOP NETWORKS LEGITSCRIPT HAS IDENTIFIED AS PURPORTING TO SELL OPIOIDS

Network	Possible Operations	Delivery
bulk2usa	Pakistan, Bangladesh	Appears to deliver an actual product
Store Pills Network	Eastern Europe	Appears to deliver an actual product
RxAff	Unidentified	Appears to deliver counterfeit drugs
Discount Pharmacy	Russia	May send counterfeit drugs or no drugs
Farma Glow	India	Unknown

⁶⁰ (Note: in order to comply with federal regulations involving the possession of controlled substances, we did not take possession of the products.)

We were unable to identify whether any of these large networks operate on the dark web also. We note that most dark web operators appear to be individuals or small groups. For example, three men in Southern California were arrested in April 2018 on suspicion of being the operators behind the Dream Market vendor “Oxygod.”⁶¹ In February 2018, a man in the UK was arrested on suspicion of being the sole operator behind the dark web vendor “Soviet Bear.”⁶²

5.3. Third-Party Websites

5.3.1 Anonymous Forums

Anonymous forums on the surface web provide outlets for people to discuss drug use and potentially engage in illicit commerce. Some users on Reddit, one of the most popular surface web forums, have stated that they have successfully purchased opioids from both the dark web⁶³ and the surface web,⁶⁴ though we were unable to verify their comments. Others have posted about getting opioids through doctors or friends.⁶⁵

In 2016, the subreddit (forums on Reddit are called “subreddits”) OpiateRollCall was banned after at least two women who posted there died soon after from opiate overdoses.⁶⁶ At the time of our research, Reddit has the active subreddits Opiates, Heroin, Oxycodone, Carfentanil, Codeine, and more. Most of these forums state that sourcing is strictly prohibited,⁶⁷ and LegitScript was unable to determine whether commerce takes place surreptitiously through these subreddits. In March 2018, Reddit banned the subreddit for Dream Market because it was “a violation of Reddit’s policy against transactions involving prohibited goods or services.”⁶⁸ A secondary Dream

⁶¹ <http://www.latimes.com/socal/daily-pilot/news/tn-dpt-me-drug-investigation-20180405-story.html>

⁶² <http://www.bbc.com/news/uk-wales-south-east-wales-42943114>

⁶³ https://www.reddit.com/r/DarkWebMarket/comments/8hojbl/any_safereliable_markets_online_on_the_dw_have/
https://www.reddit.com/r/DarkWebMarket/comments/7uv75l/wall_street_market/

⁶⁴ https://www.reddit.com/r/askdrugs/comments/708ahx/anyone_try_furanylfentanyl_powder_online_from/
https://www.reddit.com/r/opiates/comments/6rion5/so_ive_been_buying_my_prescription_drugs_online/

⁶⁵ https://www.reddit.com/r/opiates/comments/8iea2g/30s_or_pandas/
https://www.reddit.com/r/opiates/comments/8h1qwz/oxy_10_325_paradise/dygii0w/?context=1

⁶⁶ <https://www.nytimes.com/2017/07/20/us/opioid-reddit.html>

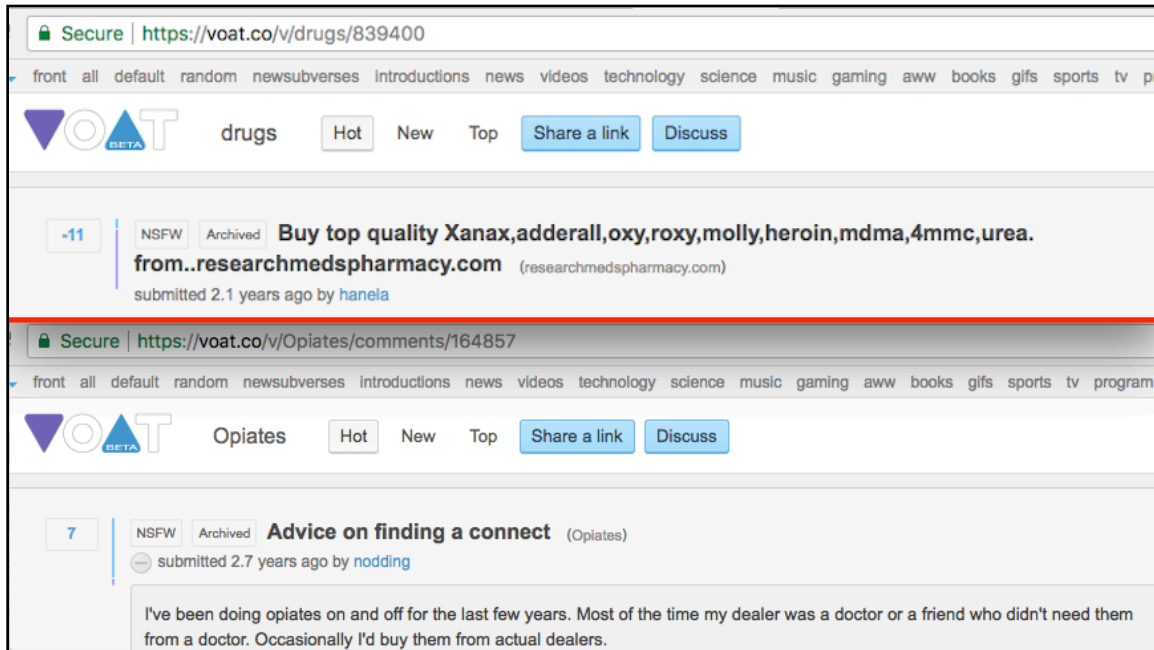
⁶⁷ <https://www.reddit.com/r/opiates/> (See column on right side.)

⁶⁸ <https://www.deepdotweb.com/2018/03/21/reddit-just-banned-r-darknetmarkets-biggest-darknet-subreddit/>

Market subreddit was subsequently banned as well, as was the subreddit DarkNetMarkets.

Other anonymous surface web forums include Voat⁶⁹ and Drug Buyer’s Guide.⁷⁰

FIG 25: AN ONLINE PHARMACY MARKETING DRUGS ON VOAT (TOP) AND A VOAT USER ASKING ABOUT WHERE TO BUY OPIATES (BOTTOM).



5.3.2 B2B and B2C Websites

Opioids make up what appears to be a small niche of the overall open web internet pharmacy market. The most prominent marketing of popular opioids such as fentanyl is on B2B and business-to-consumer (B2C) wholesaler platforms. Websites such as lookchem.com, exportersindia.com, diytrade.com, forbuyers.com, weiku.com, and toocle.com enable manufacturers and importers (primarily from China, India, and Pakistan) to supply large quantities of fentanyl and other controlled substances to buyers worldwide.

⁶⁹ <https://voat.co/v/Opiates>

⁷⁰ <http://www.drugbuyersguide.net/>

FIG 26: FENTANYL PURPORTEDLY SOLD IN “MINIMUM QUANTITIES AND LARGE ORDERS TOO” (SOURCE)

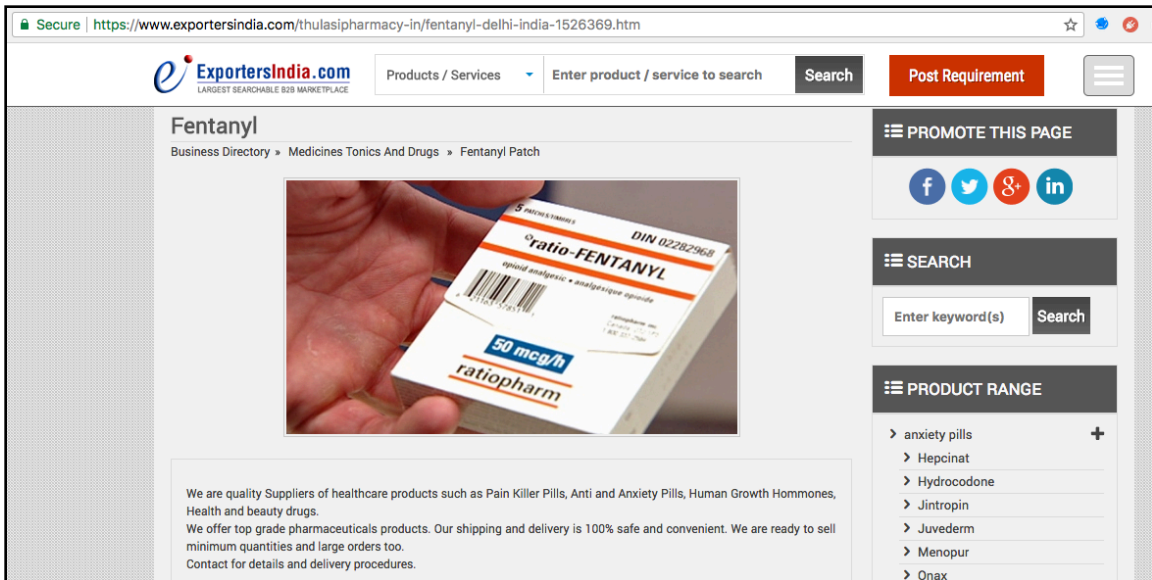
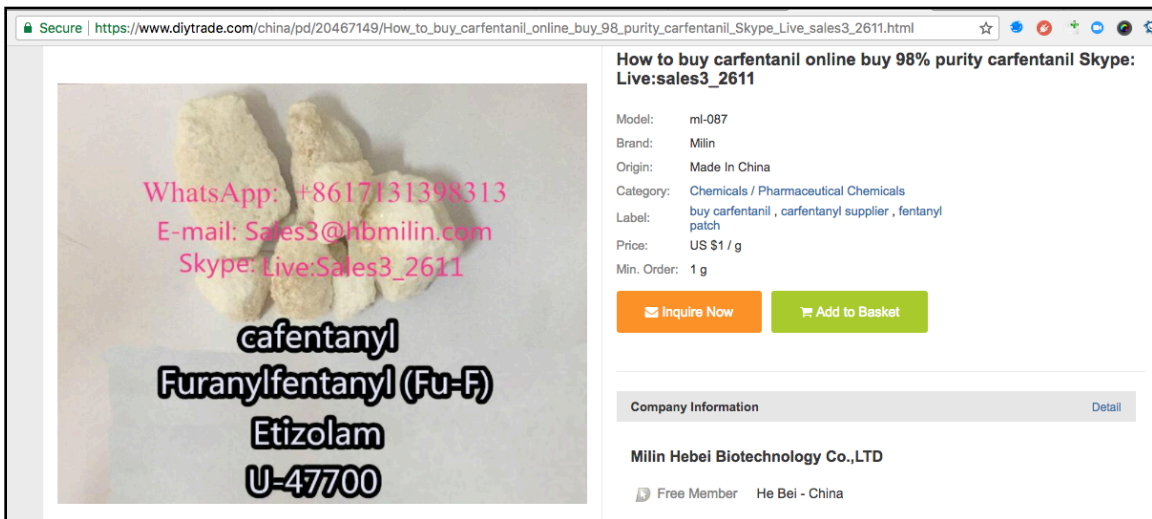


FIG 27: A CHINESE CARFENTANIL VENDOR ON DIYTRADE.COM (SOURCE)



Although LegitScript interacted with no B2B suppliers for this report, we have previously communicated with them for other research and have found that B2B vendors often agree to sell to private individuals.

Payment options for opioids marketed on B2B websites frequently include Western Union, MoneyGram, Bitcoin, and bank transfers. Vendors often describe these orders as being shipped in “discreet packaging” via international mail.

5.3.3 Social Media

Illicit online pharmacies frequently turn to social media to market their websites. Some, but not all, social media platforms have monitoring programs in place to prevent and detect illicit activity, so online pharmacies may favor less-regulated platforms or those that seem unlikely to host violative content. However, even platforms that have monitoring processes in place can find it difficult to quickly identify and remove violative content. LegitScript has viewed illicit drugs marketed on many types of platforms, such as websites for job networking, blogging, photography, and news. Some of these promote illicit online pharmacies; others list only phone numbers or email addresses, suggesting they may be operating as individuals. We note that illicit e-commerce frequently attracts nondelivery schemes.

FIG 28: THE JOB-NETWORKING WEBSITE LINKEDIN HOSTS A COMPANY PAGE FOR TRUSTEX CHEMICALS, WHICH OFFERS "DISCRETE PACKAGING" FOR OPIOIDS AND MORE.

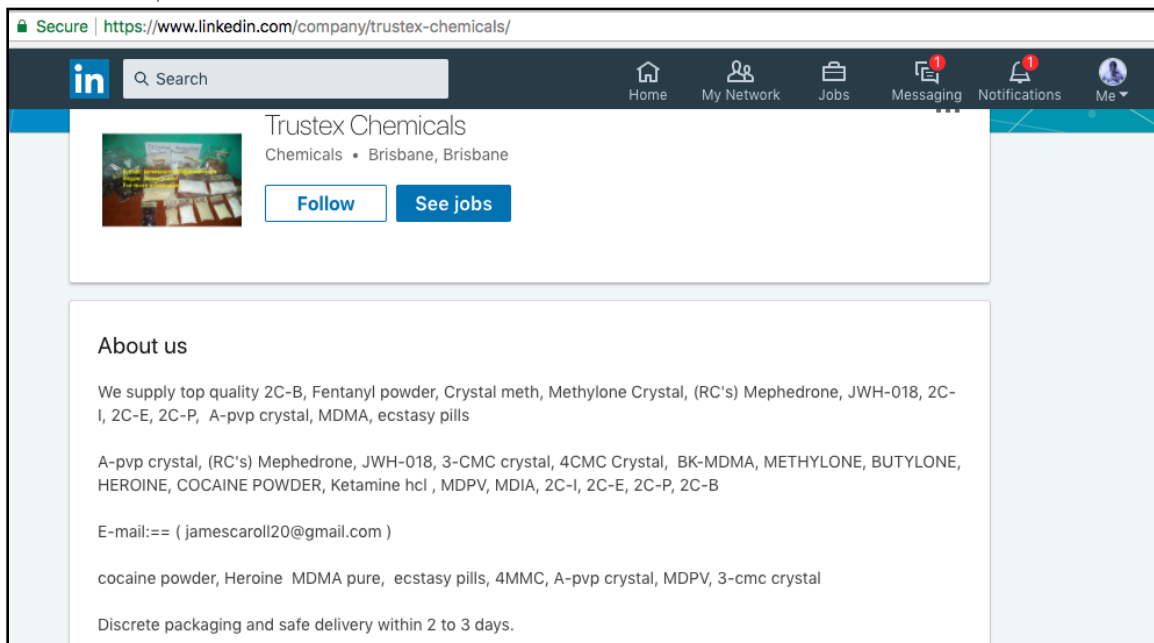


FIG 29: A USER ON THE PHOTO-SHARING WEBSITE FLICKR MARKETS OPIOIDS WITHOUT REQUIRING A PRESCRIPTION.

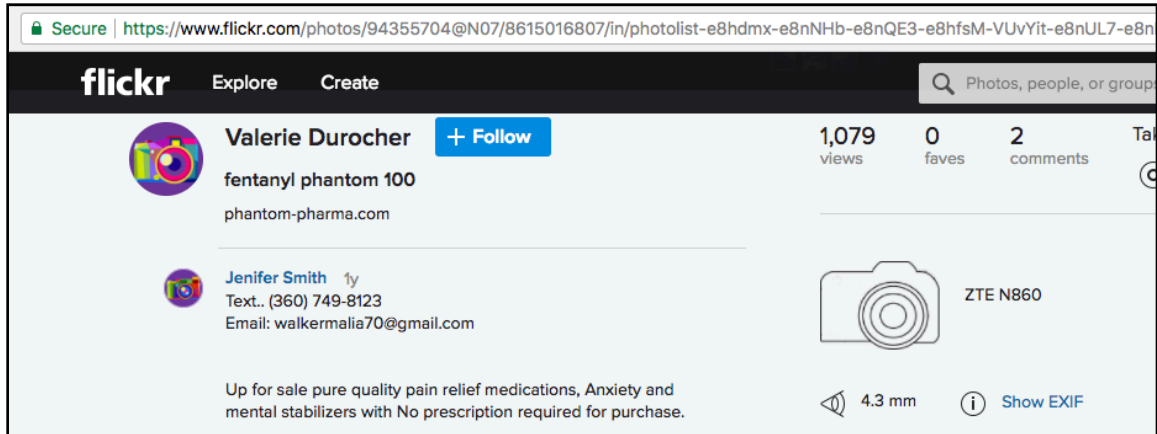


FIG 30: USER VAPOUR001, ON THE MICROBLOGGING WEBSITE TUMBLR, COMMENTS ON OTHER USERS' POSTS WITH CONTACT INFORMATION TO PURCHASE OPIOIDS.

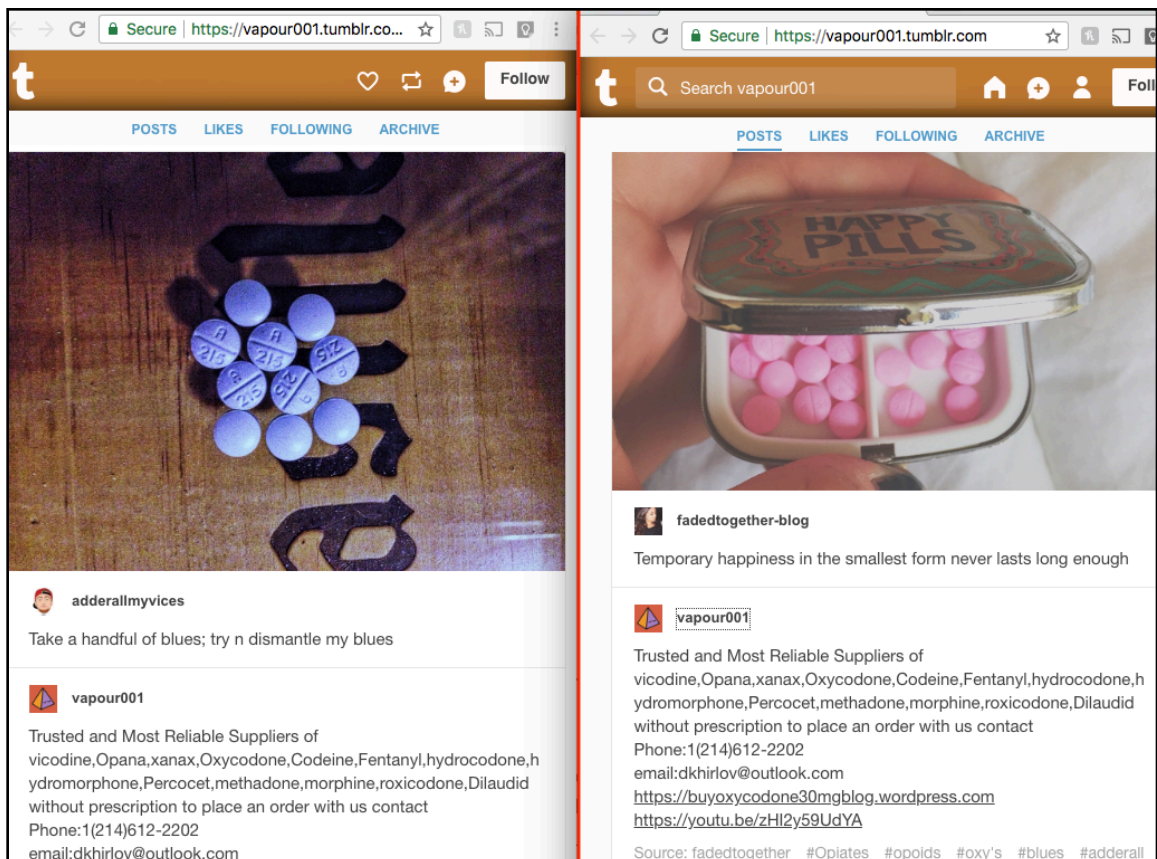


FIG 31: A TWITTER USER MARKETS OPIOIDS AND OTHER DRUGS THROUGH THE WEBSITE.



5.4. Resale From the Dark Web

Dark web anonymity makes it difficult to collect data about where products end up after they are sold and whether drugs from the dark web are then resold on the surface web. LegitScript scanned dark web drug listings and vendor reviews for indications that opioids are being resold. Although we believe most transactions are for personal use, we found indications that at least some products are purchased for resale.

One indication is whether vendors offer drugs in bulk. Of the top vendors (by total transactions) we reviewed on Dream Market (Fig 13) five of the eight sold products in quantities large enough to possibly be considered an intent to resell. We considered quantities of 3.5 grams or less to be too small for resale.

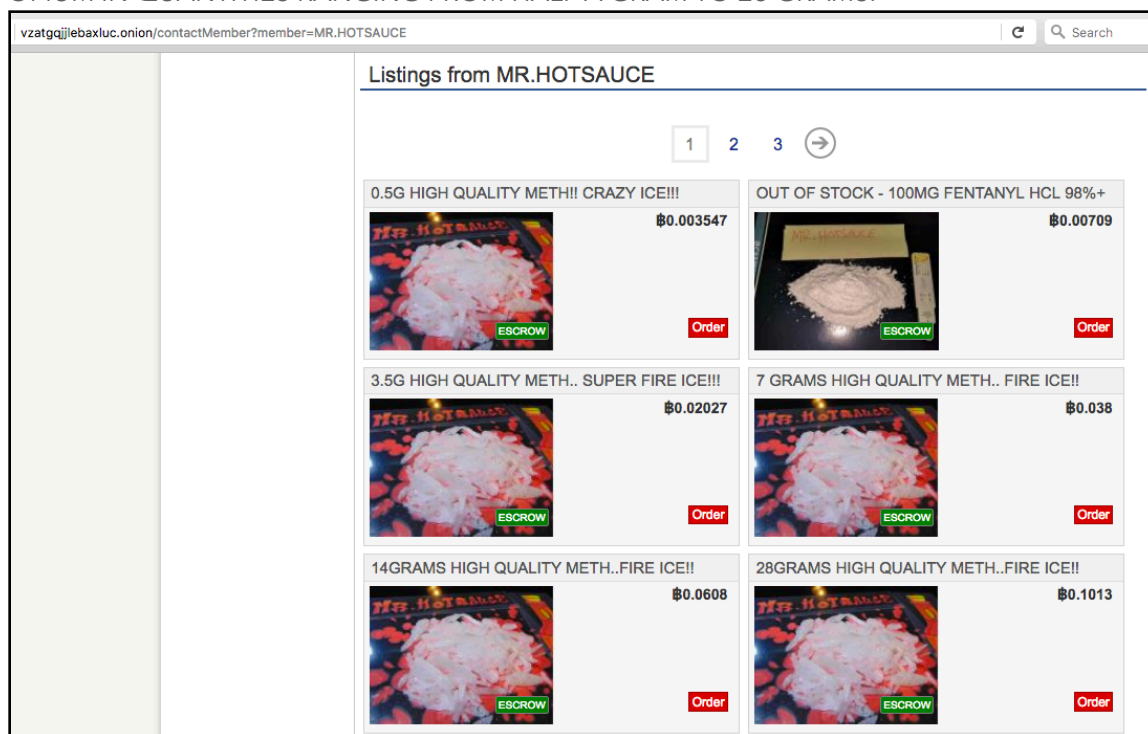
FIG 32: BULK SHIPPING OF TOP DREAM MARKET OPIOID VENDORS

Vendor Username	Bulk shipping?	Opioid product(s)	Largest quantity offered
A1CRACK	No	Heroin	3.5 grams
MR.HOTSAUCE	Yes	Opium	28 grams
MH4Life	Yes	MethoxyAcetylFentanyl (MAF)	22 grams
TRAPGOD	No	Heroin	3.5 grams
ELHEFE	Yes	Heroin	25 grams

Vendor Username	Bulk shipping?	Opioid product(s)	Largest quantity offered
HappyDrugs	Yes	Synthetic heroin and Furanyl-Fentanyl/ Mannitol mix	1 kilogram
HeinekenExpress	No	Methodone and codeine	10 milligrams (methodone) 30 pills (codeine)
cdnven	Yes	Synthetic heroin	28 grams

Although Dream Market lists the number of successful transactions, it does not offer details regarding the transactions. Therefore, we were unable to identify what portion of the vendors' transactions are bulk purchases.

FIG 33: DREAM MARKET VENDOR MR.HOTSAUCE PURPORTS TO SELL CRYSTAL METH AND OPIUM IN QUANTITIES RANGING FROM HALF A GRAM TO 28 GRAMS.



The screenshot shows a web browser window with the URL `vzatgqjlebaxluc.onion/contactMember?member=MR.HOTSAUCE`. The page title is "Listings from MR.HOTSAUCE". There are three pages of listings, with the first page selected. The listings are as follows:

Listing Description	Price	Order Button
0.5G HIGH QUALITY METH!! CRAZY ICE!!!	\$0.003547	Order
OUT OF STOCK - 100MG FENTANYL HCL 98%+	\$0.00709	Order
3.5G HIGH QUALITY METH.. SUPER FIRE ICE!!!	\$0.02027	Order
7 GRAMS HIGH QUALITY METH.. FIRE ICE!!	\$0.038	Order
14GRAMS HIGH QUALITY METH..FIRE ICE!!	\$0.0608	Order
28GRAMS HIGH QUALITY METH..FIRE ICE!!	\$0.1013	Order

Each listing includes a small image of the product, a green "ESCROW" button, and a red "Order" button.

FIG 34: VENDOR OXYGOD PURPORTS TO SELL FENTANYL IN QUANTITIES UP TO 10,000.

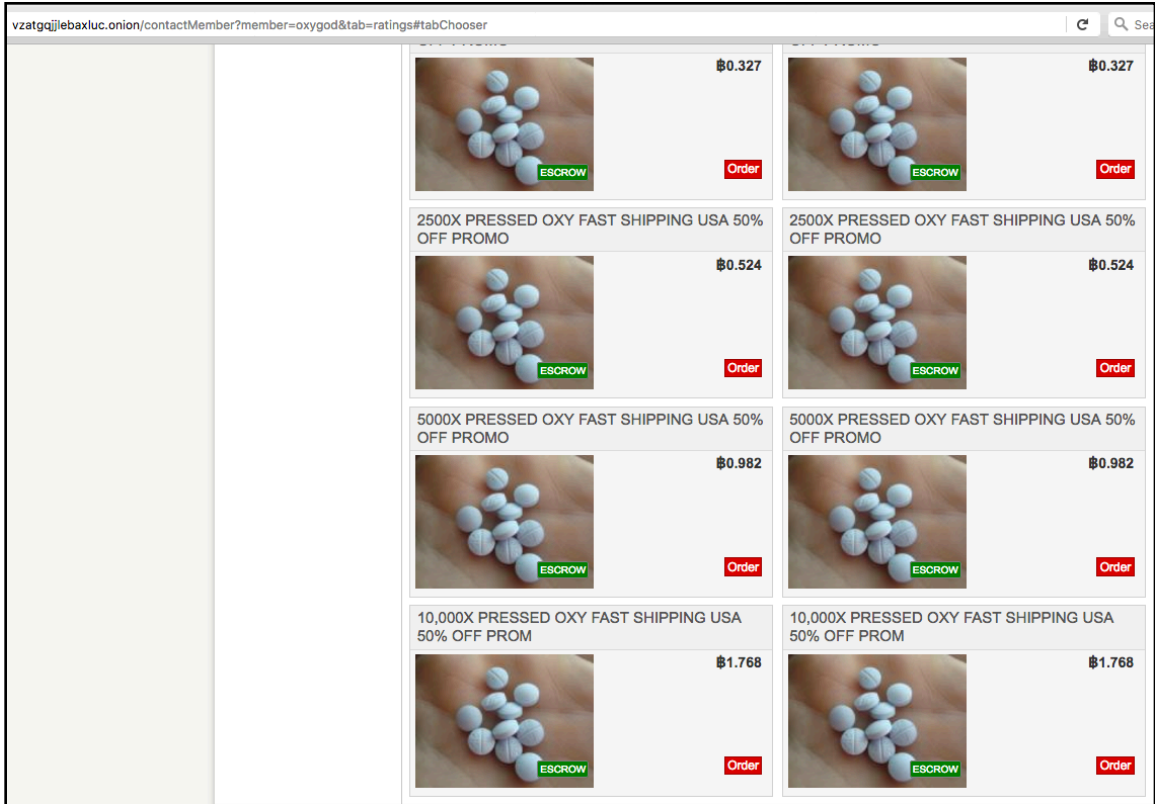
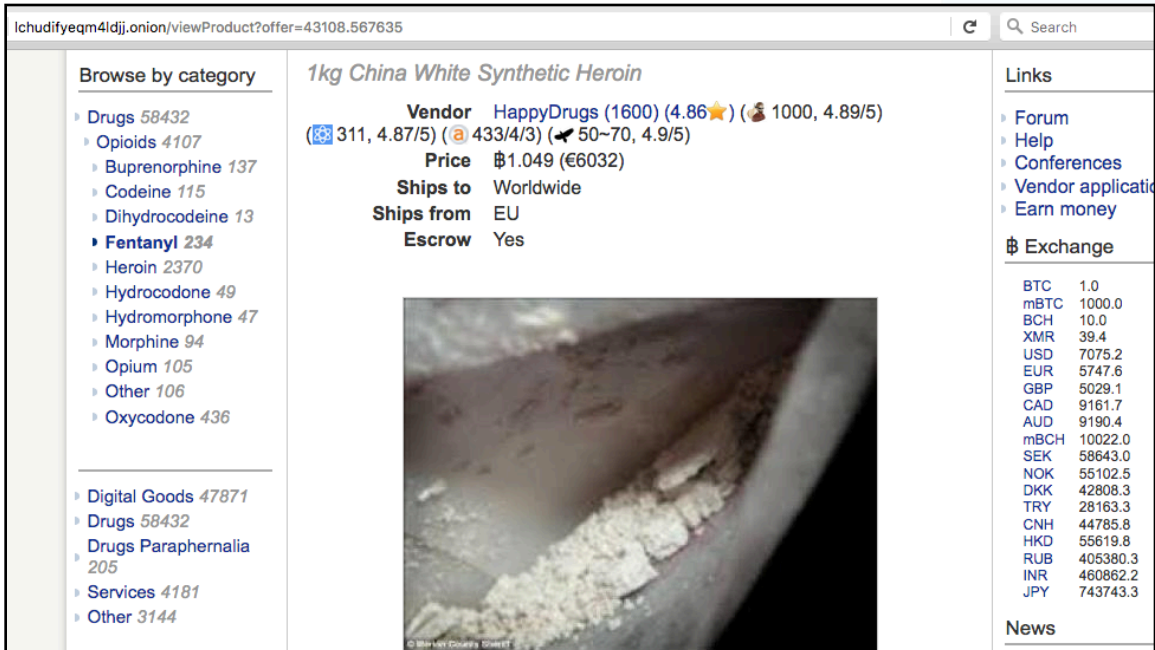


FIG 35: THE VENDOR HAPPYDRUGS PURPORTS TO SELL HEROIN IN 1 KILOGRAM UNITS.



The majority of the customer reviews we examined suggested that purchases were for personal use (they discussed using the product and critiqued the effects). However, we identified some reviews that suggest customers may have purchased a product for resale. Take, for example, the following reviews for the Dream Market vendor Oxygod.

FIG 36: AN ANONYMOUS CUSTOMER INDICATES A PURCHASE IS FOR RESALE.

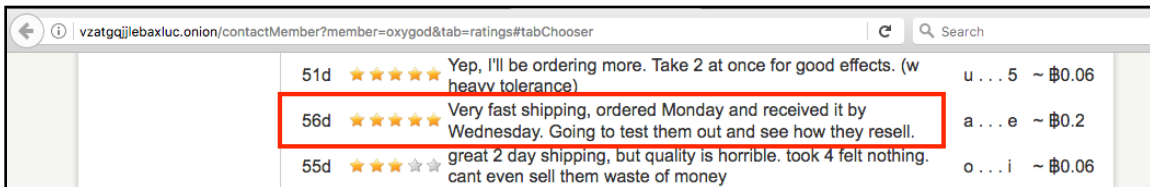
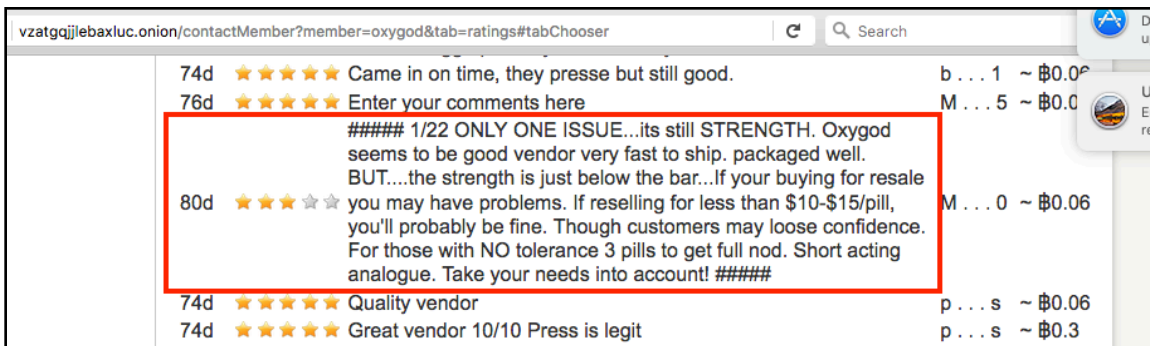


FIG 37: AN ANONYMOUS CUSTOMER STATES THAT QUALITY MAY BE SUBPAR FOR RESALE.



We were unable to verify whether products were purchased for resale and, if they were, whether they were resold on the surface web or through other means.

5.5. Noncompliant Registrars

In addition to looking at the ways in which buyers discover illicit opioids online, we note the important role of registrars as a first line of defense in preventing and removing problematic websites. Domain name operators, or registrants, receive permission from a registrar to buy a domain name. Registrars, in turn, receive permission to register most types of domain names (.com, .net, and most other top-level domains) from the Internet Corporation for Assigned Names and Numbers (ICANN), which is the central authority of internet infrastructure.

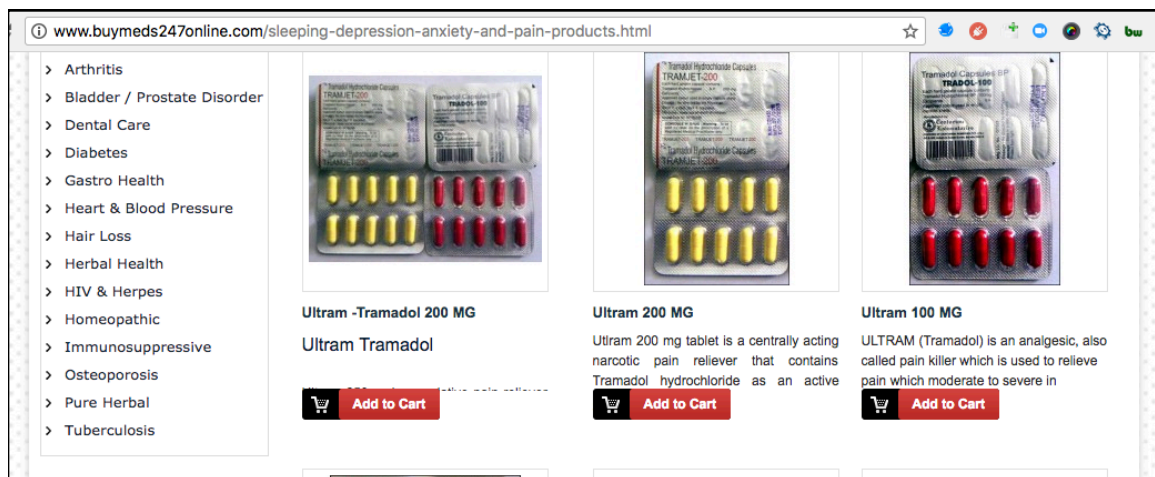
The Registrar Accreditation Agreement (RAA) between ICANN and the registrar gives the registrar both rights and obligations, including compliance with ICANN's terms. The 2013 RAA has a provision (Section 3.18.1) requiring most registrars to maintain an

abuse contact phone number and email address to receive reports of illegal activity, including the stipulation that the registrar “shall take reasonable and prompt steps to investigate and respond appropriately to any reports of abuse.”⁷¹

LegitScript has identified domain name registrars that knowingly or with willful blindness sponsor the domain names of websites marketing controlled substances. US-based registrars that repeatedly refuse to take action on domain names being used to market illegal pharmaceuticals, including opioids, include GKG.net; Epik, Inc.; and NameSilo, LLC.

For example, Epik, Inc., a registrar based in Washington state, has refused to take action in response to LegitScript’s abuse notifications without a court order. The registrar sponsors illicit online pharmacies that purport to sell a range of prescription drugs, including tramadol.

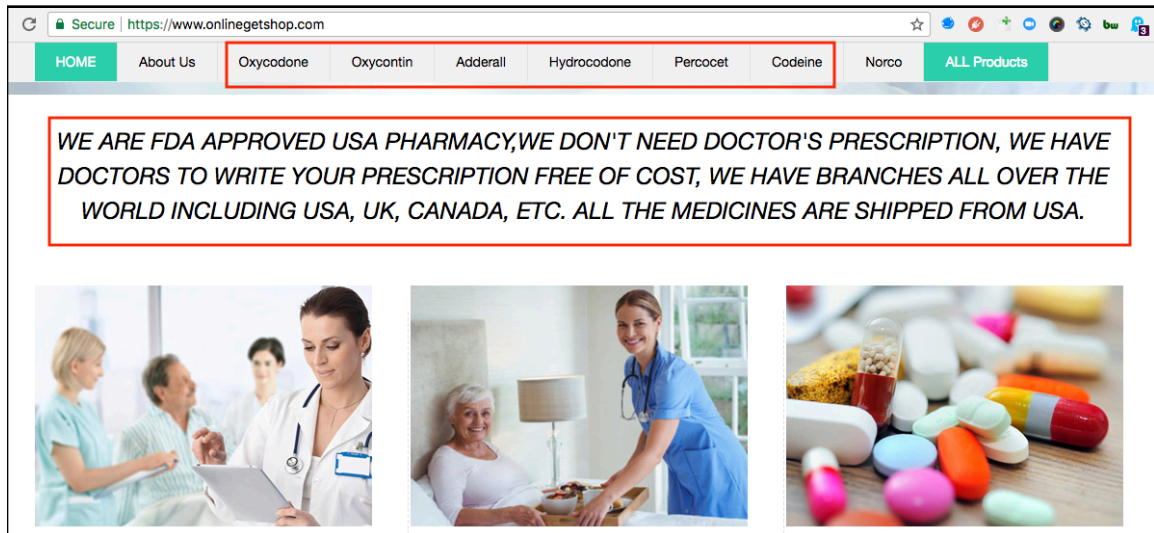
FIG 38: BUYMEDS247ONLINE.COM MARKETS TRAMADOL WITHOUT A PRESCRIPTION.



GKG has also been repeatedly identified by LegitScript as problematic. The company sponsors the website onlinegetshop.com, which lists for sale oxycontin, oxycodone, and other opioids without a prescription. The homepage states, “we dont need doctor presreption,we have my own doctor,those will write presreption free of charge,then we ship legally ship medicine in usa. [sic]”

⁷¹ <https://www.icann.org/resources/pages/approved-with-specs-2013-09-17-en#raa>

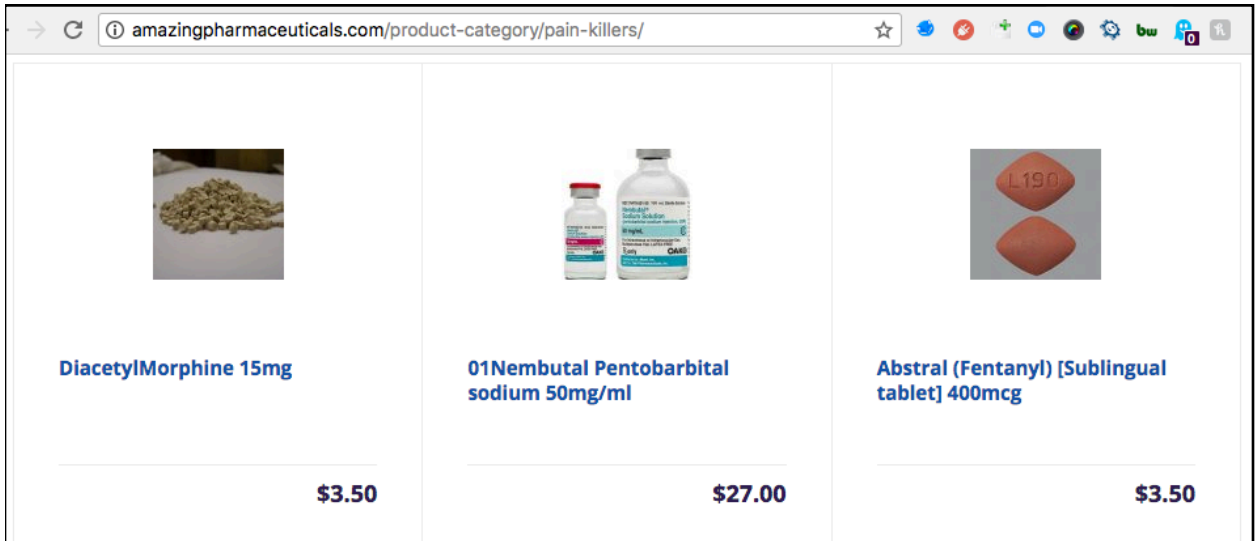
FIG 39: THE NAVIGATION BAR OF ONLINEGETSHOP.COM INCLUDES OXYCONTIN, OXYCONTIN, AND OTHER OPIOIDS.



We note that other websites that appear to be under common control with [onlinegetshop.com](https://www.onlinegetshop.com) have been suspected of fraud schemes. GKG has persistently refused to take action against illicit online pharmacies, responding repeatedly to LegitScript’s abuse notifications with the same message: “Due to the fact that we can not determine any illegal act occurring with said domain(s), you will need to address your requests with the hosting provider(s) of said domain(s). Or provide a valid US court order demonstrating illegal activity is occurring with this website.” Here, it is important to note that the vast majority of other registrars act without a court order, voluntarily suspending domain names used to illegally sell opioids.

NameSilo, LLC is an Arizona-based registrar that hosts many illicit internet pharmacies, including some purporting to sell opioids. For example, the NameSilo-sponsored website [amazingpharmaceuticals.com](https://www.amazingpharmaceuticals.com) lists opioids for sale, including fentanyl, morphine, and codeine. We were unable to verify whether products are actually shipped. LegitScript has sent multiple abuse notifications about this website and other other illicit online pharmacies NameSilo sponsors, but the company has been slow to respond, sometimes taking months to process complaints that often result in no action.

FIG 40: THE PAINKILLERS WEBPAGE FOR AMAZINGPHARMACEUTICALS.COM



Other noncompliant registrars include Rebel, Ltd. (Canada and other territories), Hosting Concepts, B.V. dba OpenProvider (The Netherlands), and Commungal Communication, Ltd. (Israel). These registrars knowingly or with willful blindness sponsor the domain names of websites marketing pharmaceuticals, though not necessarily opioids. As a direct result of these registrars' collective inaction, domain names and websites purporting to sell pharmaceuticals, sometimes including opioids, illicitly are indexed and findable on the surface web.

6. The Future of Dark Web Commerce

Mainstream interest in Bitcoin caused its value to spike in December 2017 to a high of more than \$19,000 per coin.⁷² As the general public becomes more comfortable with accepting cryptocurrency as a valid form of payment, it removes one of the barriers that prevents consumers from transacting on the dark web. It will take time to see if a wider adoption of cryptocurrency leads to an increase of dark web commerce. However, other barriers still remain, including the technical savvy needed to connect to the dark web, frustration accessing unreliable marketplaces through complex connections that can slow navigation, the fear of dealing with risky vendors, and the overall stigma of the dark web.

6.1. Dark Web Alternatives

Other forms of online commerce may be able to provide the anonymity of the dark web without the same barriers to entry. Peer-to-peer services such as OpenBazaar remove the middleman and allow illicit operations the best of both worlds: the privacy of the dark web on easily accessible and navigable software. OpenBazaar is a decentralized marketplace that, unlike surface web platforms such as Amazon or eBay, or dark web marketplaces such as Dream Market, are not controlled by any one party.⁷³ Users download an application and install it on their computers. The setup is straightforward and requires no additional software. The OpenBazaar Terms of Service state, "Most communications between parties are encrypted, but IP addresses are public and can be associated with activity on the network."⁷⁴ However, users can still obfuscate their identities using a VPN.

Other decentralized marketplaces include Particl,⁷⁵ SysCoin,⁷⁶ and BitBay.⁷⁷ All of these are powered by blockchain and offer encrypted peer-to-peer messaging for privacy.

⁷² <https://www.coindesk.com/price/>

⁷³ <https://openbazaar.zendesk.com/hc/en-us/articles/203196755-Who-controls-the-OpenBazaar-network->

⁷⁴ <https://www.forbes.com/sites/thomasbrewster/2016/03/16/openbazaar-silk-road-dark-web-drugs-ebay/#52b18cbb5ab4>

⁷⁵ <https://particl.io/>

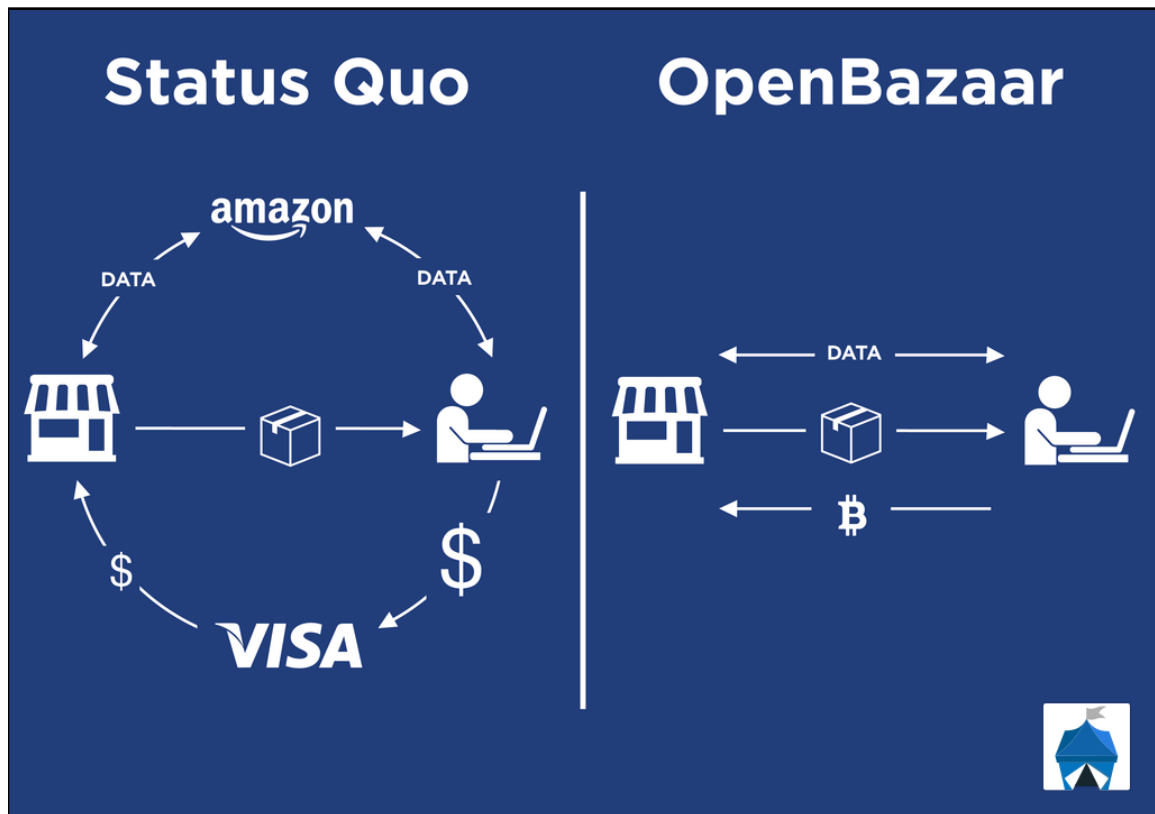
⁷⁶ <https://www.syscoin.org/>

⁷⁷ <https://bitbay.net/en/home>

Most decentralized markets are “currency-agnostic,” meaning they are designed to work with almost any cryptocurrency.

Because decentralized marketplaces have no centralized operators — such as payment providers or e-commerce platforms — it can be difficult to regulate what is sold on them. Furthermore, the decentralized nature of these marketplaces makes it extremely difficult for law enforcement to shut them down.

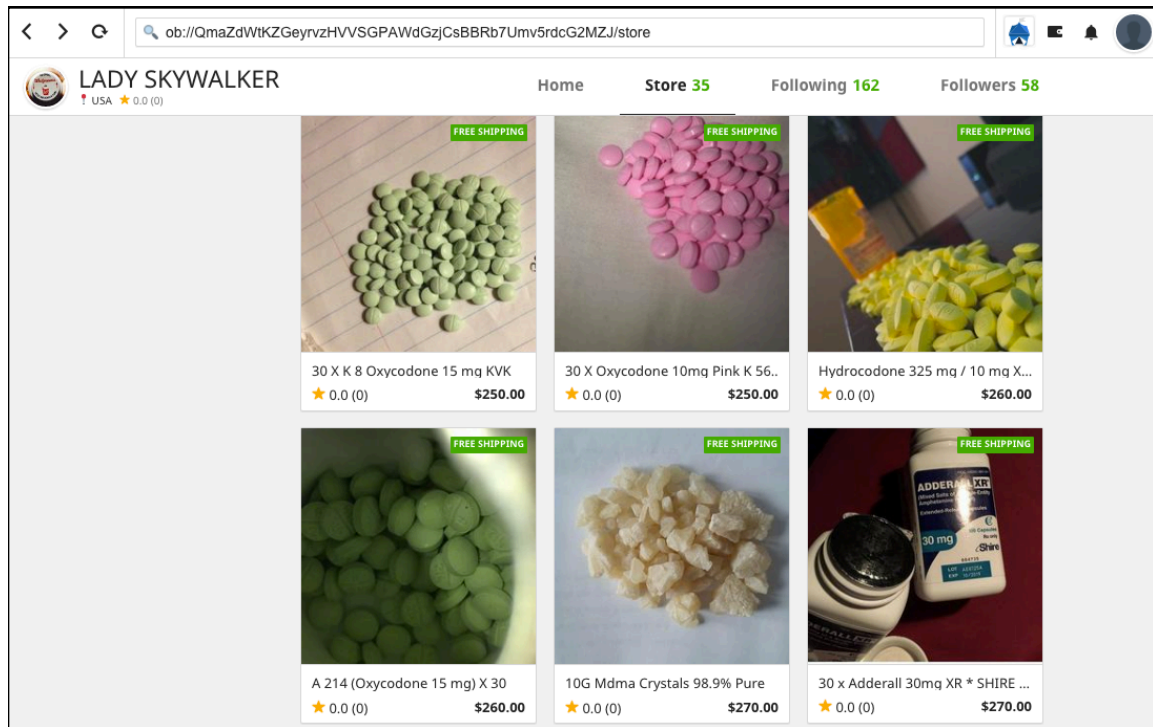
FIG 41: TRADITIONAL E-COMMERCE VERSUS PEER-TO-PEER E-COMMERCE (SOURCE)



As of March 2018, OpenBazaar’s total product listings amounted to about 7,000, many of which appear to be legal products. However, we identified a few dozen listings for oxycodone and other opioids, as well as cannabis products.

See image on the following page.

FIG 42: THE OPENBAZAAR STORE FOR LADY SKYWALKER, A KNOWN DARK WEB VENDOR



OpenBazaar also offers an escrow option, but the buyer chooses from a list of other OpenBazaar users. Therefore, there is no risk of an exit scam as with dark web marketplaces. If peer-to-peer software such as OpenBazaar can provide anonymity and security tantamount to the dark web, it may become a preferred method for illicit commerce.

Encrypted communication applications, such as Discord, Telegram, Wickr, and WhatsApp, may also see an increase in illicit commerce as authorities crack down on dark web marketplaces.⁷⁸ These apps can be used without any expertise or special equipment beyond a smart phone.

Anonymity will continue to provide challenges to law enforcement, but the sale of physical goods will always present risks to those transacting illegally. The anonymity of buyers and sellers can become compromised as soon as physical goods enter into postal services. This may be a point of focus for investigators.

⁷⁸ <https://www.illicit-trade.com/2017/10/dark-web-drugs-weapons-traders-turn-encrypted-apps-crackdown-hidden-marketplaces/>

7. Conclusion

The sale of opioids and other drugs on the dark web is a serious problem that has resulted in overdoses and deaths. This report sought to capture the extent of dark web opioid sales, especially in relation to the surface web.

Here are some key takeaways of our research:

- **Opioids are being sold on the dark web, which is part of the problem.**
- **The dark web is small when measured by website.** There likely exist somewhere between 5,000 and 30,000 websites, a fraction of a percentage of the content of the World Wide Web.
- **Dark web traffic is flat overall.** Although volatile, dark web traffic has not changed significantly in the past few years. (As of March 2018, the estimated average number of daily users appears to be about the same as it was in 2014.)
- **Dark web usage is narrow.** Few people use the dark web compared to the surface web (tens of people per every million internet users). Illicit drug commerce on the dark web is a legitimate problem, but may cater to a narrow demographic within the wider population of opioid abusers. Drug sales volume is difficult to estimate.
- **The dark web can be troublesome to use.** The current technical barriers to entry on the dark web may slow mainstream expansion. However, there may be an increase in usage as the wider public embraces cryptocurrencies.
- **Dream Market is king — for now.** Silk Road was the original name in dark web marketplaces, then it was AlphaBay. Right now, Dream Market dominates the dark web e-commerce space (of the top 12 marketplaces we surveyed, it had 56 percent of the drug listings). Should Dream Market get shut down by authorities or engage in an exit scam, another — such as Wall Street Market or Tochka — will certainly take its place as the preferred marketplace.
- **Cannabis and ecstasy are the drugs of choice.** Opioids accounted for only about 8 percent of the drug listings we surveyed on dark web marketplaces. Heroin accounted for about two-thirds of the opiate listings.

- **Western countries are major opiate shippers.** Top non-heroin opioids (oxycodone, fentanyl, and morphine) shipped mostly from the US, UK, Europe, and Canada (as stated by vendors). We were unable to identify the source of supply, though federal investigations indicate China is the primary manufacturer of synthetic opioids.
- **Most customers appear to buy for personal use.** Some top vendors sell products in bulk, but we were only able to identify a few user comments related to resale, and it wasn't clear where products were resold. Although some dark web drugs certainly end up being sold on the street or through the surface web, the majority of user reviews seem to indicate purchases are for personal consumption.
- **Nondelivery schemes exist on both the surface web and dark web, but probably to different degrees.** We are fairly certain that a meaningful proportion of surface web websites that appear to illicitly sell opioids are actually just ripping people off; however, this is not zero. On the dark web, however, escrowed payments and reputation scores may significantly reduce fraud, indicating that a higher proportion of these vendors actually deliver opioids or some kind of drug product.
- **Paid ads for opioids on the surface web are functionally nonexistent.** Illicit online pharmacies may look for unpaid ways to market their products, such as SEO, unregulated social media platforms, and anonymous forums on the surface web.
- **Peer-to-peer software may be the future.** A more viable alternative to illicit online drug sales may lie in direct peer-to-peer software such as OpenBazaar, which has the potential to provide the same anonymity of the dark web but is easier to use and navigate. As a decentralized marketplace, it is difficult to regulate or shut down, and those transacting through the software don't have to worry about exit scams.

LegitScript appreciates the opportunity to have conducted this analysis for the members of the Center for Safe Internet Pharmacies.