



ROGUE RX ACTIVITY REPORT

Disrupting Illegal Online Pharmacies: Lock-and-Suspend as a Tool to Protect Patients

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NABP would like to acknowledge the Alliance for Safe Online Pharmacies Foundation (ASOP Global Foundation) for its financial support of this publication. The ASOP Global Foundation is a 501(c)(3) charitable, nonprofit organization dedicated to addressing the growing public health threat of illegal online drug sellers, concentrating its activities in research and education to inform consumers and policymakers.



I. Summary

Although government agencies and private actors have worked hard to curb the illegal sale of prescription drugs online, there has not yet been a collective effort to deprive illegal actors of their most important resources – their domain names. Locking and suspending domain names attacks the problem at its root. When a domain name is “suspended,” it no longer points to any hosted content and ceases to function. Consumers cannot access the website using the domain name. Any existing links, software, or email addresses relying on the domain name break. When it is locked, it cannot be transferred to another registrar. Because lock-and-suspend renders dangerous websites immediately unreachable through the domain name system (DNS), it directly impacts patient safety.

Over the past 20 years, government agencies and private actors have tried many techniques to stop illegal online pharmacies. In 2009, the Department of Justice filed charges against Google for knowingly permitting illegal online pharmacies to purchase ads on Google AdWords.¹ In response, most major advertising platforms began restricting ads for pharmacies. Around the same time, software companies improved email spam filters, which mitigated the onslaught of prescription drug offers. Of course, illegal online pharmacy networks were quick to adapt. They invested in search engine optimization and social media. More recently, credit card networks updated due diligence requirements to underwrite online pharmacies. This impacted illegal online pharmacies’ access to the major card brand networks (eg, Visa, Mastercard). In response, these criminals increased their use of cryptocurrency, wire transfers, and money laundering schemes. While these efforts to stop illegal online pharmacies have been effective, there are still tens of thousands of illegal online pharmacies hawking substandard prescription drugs to American patients.

Why are there still so many illegal online pharmacies? Most illegal online pharmacies belong to large criminal networks that operate thousands of domain names in redundancy; if one domain name is shut down, it causes minimal disruption because the network has thousands of backups. Therefore, the shuttering of websites must be performed at scale to be effective. By partnering with domain name registrars and registries, governments and private actors can leverage existing infrastructure to have an outsized impact. When a significant number of a criminal network’s domain names are suspended, the network can no longer fund its operation, and it collapses.

¹In 2018, Google AdWords was renamed Google Ads.



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Some domain name registrars and registries have taken voluntary action to shut down illegal online pharmacies. But this is a small dent in a far bigger problem. Every year, the National Association of Boards of Pharmacy® (NABP®) finds thousands of new illegal online pharmacies, at least half of which sell controlled substances (CS). In addition, NABP has reached out to multiple registrars and registries and has found little enthusiasm for removing illegal online drug sellers. NABP applauds all registries and registrars who have actively worked to shut down illegal online pharmacies, especially because these compliance activities come at a cost to their bottom line. Those who routinely take action against illegal online pharmacies put themselves at a competitive disadvantage compared to those who turn a blind eye. Without government intervention, there is insufficient incentive for the domain name industry as a whole to course correct.

This report defines the problem and details historic efforts to combat these bad actors. It then provides an overview of the DNS and explains why the DNS is the right place to mandate action against illegal online pharmacies.

II. Definition of an Illegal Online Pharmacy

To operate legally in the United States, a pharmacy must, at minimum: (1) hold pharmacy licensure in the state where it is located and in each state to which the pharmacy dispenses; (2) require a valid prescription based on a legally established practitioner-patient relationship; and (3) sell only those prescription drugs that have been authorized for sale by Food and Drug Administration (FDA).² These three criteria are fundamental to patient safety. Although illegal online drug sellers often describe themselves as “pharmacies,” they do not meet the criteria described above. They do not hold required licensure in *any* US state, they do not dispense pursuant to a valid prescription, and they typically do not sell FDA-approved drugs. Since 1999, NABP has been collecting websites whose primary purpose is to facilitate illegal online drug sales. In 2008, NABP began publishing these websites via its Not Recommended List (NRL).

There are over 40,000 domain names on the NRL. Regarding the activity facilitated by these domain names, NABP has observed the following: 96% do not require a valid prescription (most do not require

²<https://www.bloomberglaw.com/product/health/document/25846313000>

a prescription at all), 85% offer medicines not authorized by FDA, and over 50% offer CS. Although all domain names on the NRL facilitate US shipping, none of the sellers hold required licensure in any US state.

These criminal actors put patients at risk. According to a study published in the *Annals of Pharmacotherapy*, FDA took 130 enforcement actions against counterfeit medication rings from 2016 through 2021.³ In another study, researchers purchased medication from illegal online pharmacies and discovered that 26% of the samples contained toxins such as mercury, lead, and arsenic, while 37% of the samples contained no active ingredient at all.⁴ These data align with a report from the European Alliance for Access to Safe Medicines, which found that 62% of medicines purchased online are substandard or counterfeit.⁵ And, of course, because most of these illegal actors sell prescription medication without requiring *any* prescription, patients purchasing from these websites are at risk simply from taking prescription medication – including opioids and other CS – without professional supervision.

III. Example of an Illegal Online Pharmacy

Below, please find an example of an illegal online pharmacy. The domain name is *pharmaci.org*, which was taken offline in March 2022 as a result of an NABP notification to the .ORG registry.

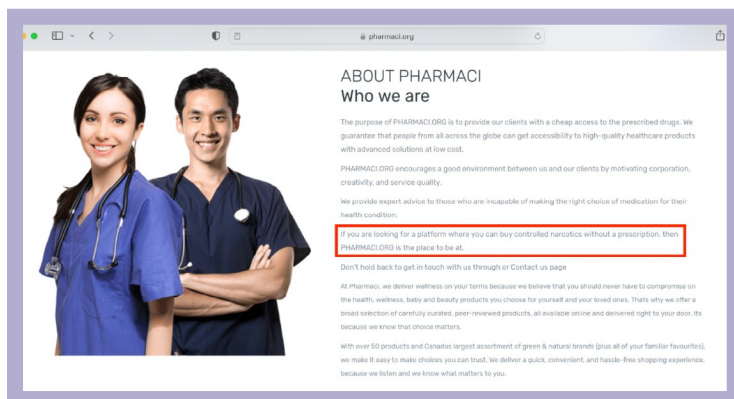


FIGURE 1: *pharmaci.org* offered prescription-only drugs, including CS, without requiring a prescription.

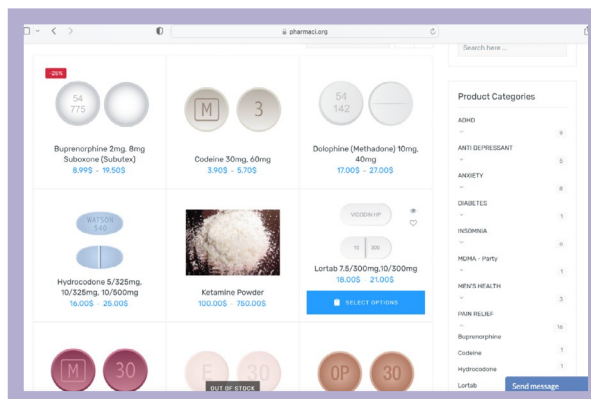


FIGURE 2: *pharmaci.org* offered prescription-only drugs, including opioids, not authorized for sale in the US.

³<https://journals.sagepub.com/doi/10.1177/10600280221092482>

⁴<https://www.safemedicines.org/2010/10/korean-study-highlights-dangers-of-buying-ed-drugs-from-online-pharmacies.html>

⁵https://eaasm.eu/wp-content/uploads/455_EAASM_counterfeitingreport_0206081.pdf



The online “pharmacy” located at *pharmaci.org* failed to meet the three basic criteria for legally operating as a pharmacy. It offered prescription-only drugs, including opioids, without requiring a prescription. As noted in its “About” web page, “If you are looking for a platform where you can buy controlled narcotics without a prescription, then PHARMACI.ORG is the place to be at.” It also offered prescription-only drugs, including CS, that are not authorized for sale by FDA. Moreover, *pharmaci.org* has never been licensed as a pharmacy in *any* US state.

IV. Illegal Online Pharmacy Networks

For the past 10 years, industry experts have consistently estimated that, at any given time, there are between 30,000 and 40,000 active illegal online pharmacies.⁶ Most illegal online pharmacies belong to organized and international criminal networks.⁷ To best reach consumers, some networks oversee thousands of related websites. In many cases, network operators create website templates and provide back-end services (eg, payment processing, customer service call centers, and distribution). They offer these templates and services to “affiliate marketers” who: (1) operate one or more websites on behalf of the network; (2) drive traffic to those websites (through various search engine optimization techniques or other nefarious activity, like spam emails); and (3) take a small cut of the profits.⁸ In many cases, the networked websites redirect to a much smaller number of network-controlled “anchor” websites that finalize the sale and process payments.⁹

According to the US Government Accountability Office:

[P]iecing together these operations can be difficult because rogue Internet pharmacies can be composed of thousands of related websites. Although a small number of individuals own the majority of rogue Internet pharmacies operating across the world, they may contract with hundreds or thousands of individuals to set up, run, and advertise their websites . . . Additionally, rogue Internet pharmacies frequently locate different components of their operations in different countries, further complicating efforts to unravel the entirety of a rogue Internet pharmacy operation.¹⁰

⁶<https://www.gao.gov/assets/gao-14-386t.pdf>,
<https://digital.sandiego.edu/cgi/viewcontent.cgi?article=1033&context=ilj>,
<https://abcnews.go.com/Health/fda-warns-consumers-dangers-buying-prescription-drugs-online/story?id=17352895>,
<https://www.politico.com/magazine/story/2014/12/pharma-spam-113562/>

⁷<https://www.fda.gov/news-events/press-announcements/fda-launches-global-operation-crack-down-websites-selling-illegal-potentially-dangerous-drugs>

⁸<https://nabp.pharmacy/wp-content/uploads/2020/05/Rogue-Rx-Activity-Report-May-2020-1.pdf>

⁹https://archives.fbi.gov/archives/news/stories/2009/march/pharmacy_030309

¹⁰<https://www.gao.gov/assets/gao-13-560.pdf>



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To better understand illegal online pharmacy networks, it might be helpful to provide a visual. The following nine websites are all controlled by the same network. They share a website template, customer service phone number, and anchor site for payment processing – but utilize different domain names. NABP can confirm that thousands of websites share this same phone number.

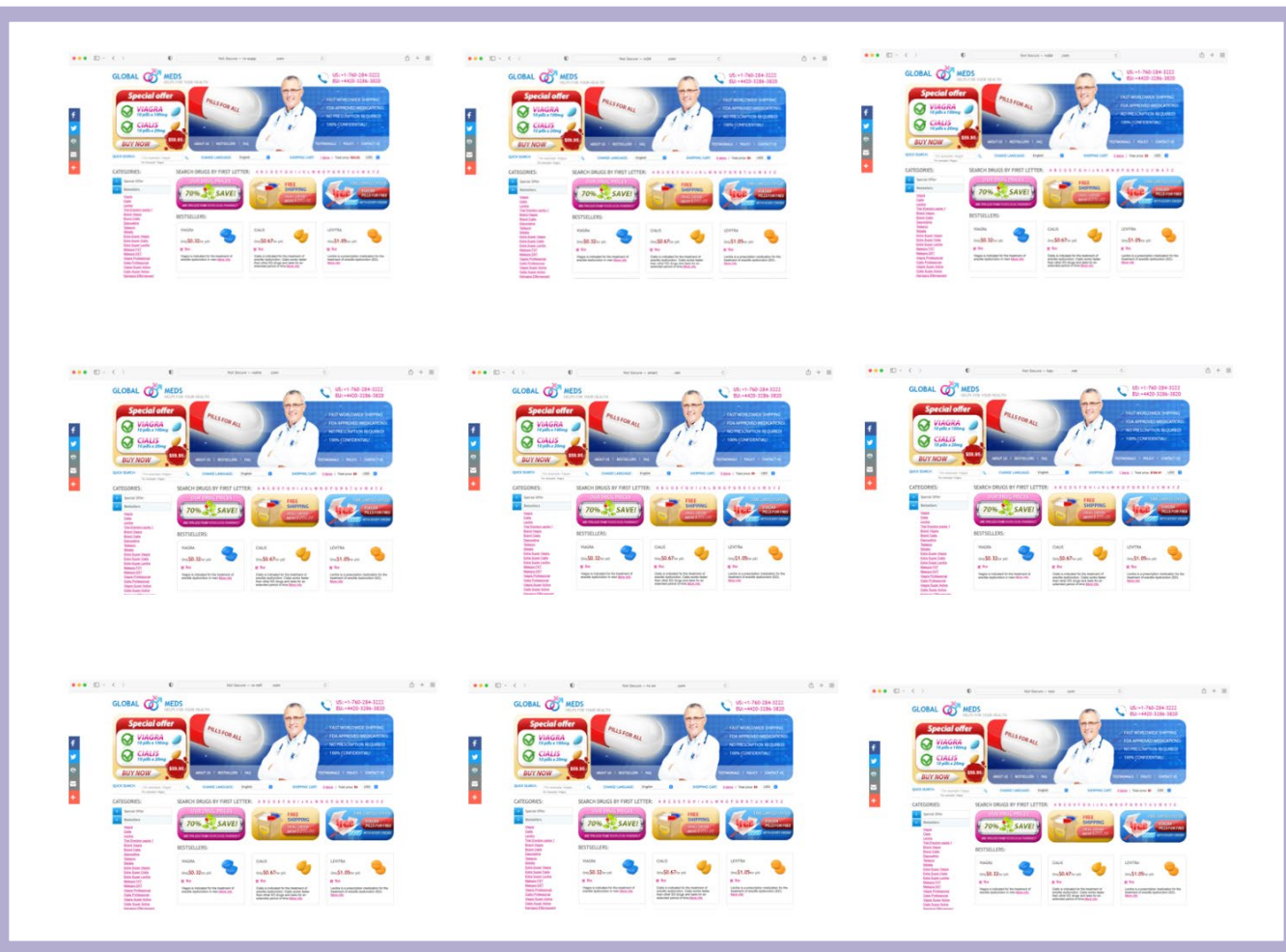


FIGURE 3: These nine illegal online pharmacy websites share the same website template, customer service phone number, and anchor site for payment processing.



V. Consumers Are Increasingly Comfortable Purchasing Medication Online

While the estimated number of active illegal online pharmacies has remained steady for the past decade, demand has increased as more consumers shop online. The coronavirus disease 2019 pandemic has only accelerated this shift. According to US Census Bureau data, e-commerce sales jumped over 32% in 2020 compared to the prior year.¹¹ In 2021, total e-commerce sales were estimated at \$870.8 billion, an increase of 14.2% from 2020.¹²

This change in consumer shopping behavior also applies to the sale of drugs. According to a 2012 FDA survey, 23% of surveyed US adult internet consumers reported purchasing prescription drugs online.¹³ Only five years later, this number jumped to 33%.¹⁴ By 2021, 42% of surveyed Americans reported purchasing medications online.¹⁵

Despite the best efforts of government entities and nonprofits to educate the public about the dangers associated with illegal online pharmacies, Americans continue to be largely unaware of the prevalence and risks of illegal online pharmacies. According to a 2021 survey, 45% of Americans mistakenly believe that all websites offering prescription medications to Americans have been approved by FDA or state regulators.¹⁶ Belief in this misconception rises to 59% among those Americans who have previously purchased prescription medicines via the internet.¹⁷

VI. Historic Efforts to Combat Illegal Online Pharmacies

What methods have been used – and continue to be used – to stop these criminal entities? For decades, federal agencies – including FDA's Office of Criminal Investigations, Department of Homeland Security's US Customs and Border Protection, and US Immigration and Customs

¹¹<https://www2.census.gov/retail/releases/historical/ecommm/20q4.pdf>

¹²<https://www2.census.gov/retail/releases/historical/ecommm/21q4.pdf>

¹³<https://wayback.archive-it.org/7993/20170722175833/https://www.fda.gov/Drugs/ResourcesForYou/Consumers/BuyingUsingMedicineSafely/BuyingMedicinesOvertheInternet/BeSafeRxKnowYourOnlinePharmacy/ucm318497.htm>

¹⁴https://buysaferx.pharmacy/wp-content/uploads/2017/09/us_sept2017-1.pdf

¹⁵https://buysaferx.pharmacy/wp-content/uploads/2021/07/ASOP-Global-Foundation-2021-Consumer-Behavior-Survey-Key-Findings_Final-7.9.2021.pdf

¹⁶*Id.*

¹⁷*Id.*



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Enforcement – have conducted investigations, brought criminal cases against illegal online pharmacy operators, seized assets, and intercepted shipments of illegal drugs.¹⁸ US agencies, along with representatives from many other countries, participate annually in INTERPOL’s “Operation Pangea,” a global week of action aimed at disrupting illegal online drug sales.¹⁹

At the same time, many private stakeholders – including internet companies and the payments industry – have increased their voluntary compliance efforts, attempting to serve as choke points to deter illegal activity. For example, in 2019, Bing began posting pop-up consumer warnings for all websites found on NABP’s NRL. Bing also blocks all illegal online pharmacies listed on FDA’s Internet Pharmacy Warning Letters web page from its US organic search results.²⁰ Google has committed to de-indexing illegally operating websites named in FDA warning letters that cite the unlawful sale of opioids.²¹ Social media platforms, including Facebook and Instagram, redirect users looking for opioids to a government helpline.²² E-advertising platforms, including Bing, Facebook, Google, Reddit, Snapchat, TikTok, and Twitter, have policies in place to prevent the advertising of illegal online pharmacies.²³ Visa and Mastercard have extra underwriting requirements for merchants offering prescription-only medications.

These voluntary actions help raise consumer awareness and deter patients from using illegal online pharmacies; however, on their own, these actions are insufficient. For this reason, the prevalence of illegal online pharmacies, year after year, remains remarkably high. The longer these domain names remain active, the more sophisticated their operators become in circumventing mitigation efforts. The power to turn off a domain name belongs to another sector of the internet infrastructure – domain name registries and registrars.

¹⁸<https://www.gao.gov/assets/gao-14-386t.pdf>

¹⁹<https://www.interpol.int/en/Crimes/Illicit-goods/Pharmaceutical-crime-operations>

²⁰<https://blogs.bing.com/search/2015/08/06/bing-to-warn-customers-about-the-threats-of-fake-online-pharmacies/>

²¹<https://www.fda.gov/news-events/press-announcements/fda-takes-new-enforcement-actions-part-agencys-ongoing-effort-combat-illegal-online-sales-opioids>

²²<https://about.fb.com/wp-content/uploads/2018/11/addressing-the-opioid-crisis-1.pdf>

²³<https://about.ads.microsoft.com/en-us/policies/restricted-categories/pharmacy-and-healthcare-products-and-services#pharmacy-and-prescription-only-medication>,

<https://www.facebook.com/business/news/updating-and-enforcing-facebook-ad-policies-prescription-drugs>,

<https://support.google.com/adspolicy/answer/176031?hl=en>,

<https://redditinc.force.com/helpcenter/s/article/Reddit-Advertising-Policy-Restricted-Advertisements#N9>,

<https://snap.com/en-US/ad-policies>,

<https://ads.tiktok.com/help/article?aid=10005232>,

<https://business.twitter.com/en/help/ads-policies/ads-content-policies/healthcare.html>



VII. Domain Name Infrastructure and Its Role in Enforcement

Enforcement action at the domain-name level is binary; the domain name either resolves or it does not resolve. For this reason, suspending domains should be limited to cases where: (1) the illegal content is clearly distinguishable from legitimate content; (2) the harm is substantial; and (3) other enforcement options are insufficient. Few subject matters check these boxes. To better understand how the domain name infrastructure can be leveraged to protect internet users, it is helpful to provide a brief overview of that infrastructure.

A. The Role of a Domain Name in the Internet Infrastructure

A domain name is a fundamental part of the internet infrastructure.²⁴ To communicate via the internet, computers utilize Internet Protocol (IP) addresses, which consist of a series of numerical signifiers that demonstrate the location of content.²⁵ Phone numbers function similarly. A phone number includes a country code, a local area code, and an individual subscriber number. In combination, these numbers route a phone call to a specific account. However, just like IP addresses, memorizing phone numbers is cumbersome. To ease this burden, modern phones utilize a contacts app that translates the phone numbers of known entities into human readable strings that are more memorable and relatable (eg, “Mom” or “Pediatrician”). In the world of the internet, domain names are like the human readable translation you find in your contacts app. They exist to route users from something they can know or read to something more mechanical and specific – the individual IP addresses. However, unlike a phone’s contacts app, which allows each user to customize the human readable strings (eg, not all “Mom” entries dial the same phone number), domain name resolution is standardized across all internet users.

Domain names have two primary parts: the top-level domain (TLD) and the second-level domain. The TLD is found to the right of the dot. For example, NABP’s patient-focused domain name is *safe.pharmacy*; its TLD is “.pharmacy.”²⁶ The most popular generic TLDs are “.com,” “.org,” and “.net.”²⁷ A website’s second-level domain is located immediately to the left of the dot. In the example provided above, NABP’s second-level domain is “safe.” For a simple visual depiction, see to the right.

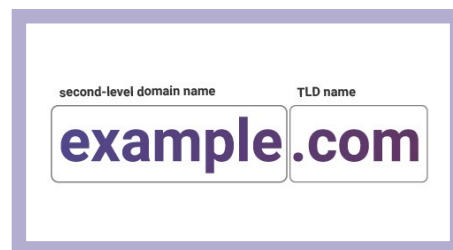


FIGURE 4: Basic elements of a domain name

²⁴<https://www.icann.org/en/icann-acronyms-and-terms/domain-name-en>

²⁵<https://www.icann.org/en/icann-acronyms-and-terms/domain-name-system-en>

²⁶The .pharmacy domain name registry is operated by NABP.

²⁷<https://www.verisign.com/assets/domain-name-report-Q42021.pdf>



To maintain a single, universal, and interoperable internet, the domain name infrastructure is governed by the Internet Corporation for Assigned Names and Numbers (ICANN). Because this task is massive (and global), ICANN delegates the management of domain names within a TLD to a registry operator, who then subdelegates the reservation of specific domain names to contracted registrars. There are over a thousand ICANN-accredited registrars globally.²⁸ The individual or company that registers a specific domain name is known as the registrant. In 2020, there were over 350 million registered domain names.²⁹

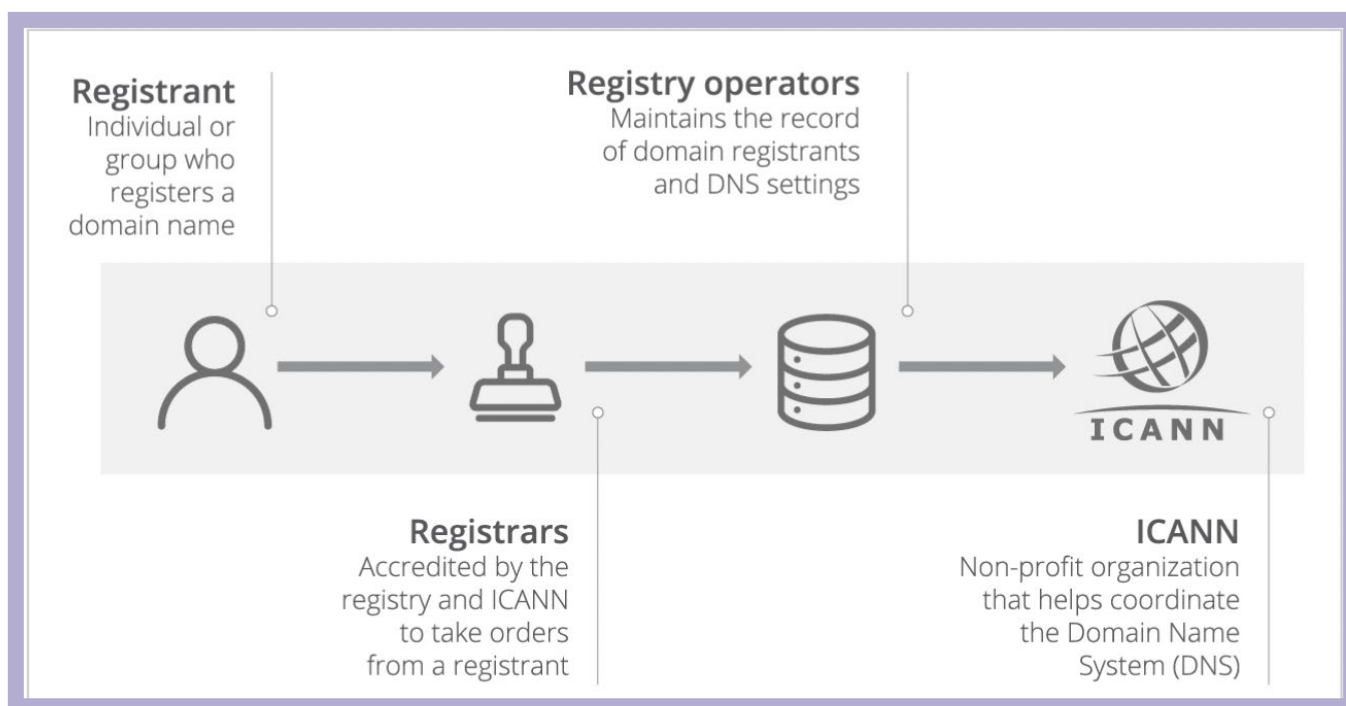


FIGURE 5: Flowchart of the DNS³⁰

Although these terms may not be readily familiar to most Americans, many people have interacted with players in the DNS. A real-world example: an entrepreneur decides to open a local business. To be competitive in the modern world, they decide to create a website. First, they find a registrar. The registrar helps determine which domain names are already taken and which remain available. The entrepreneur selects a domain name and pays the registrar to “rent”

²⁸<https://www.icann.org/resources/pages/domain-name-industry-2017-06-20-en#>.

<https://www.icann.org/en/accredited-registrars?sort-direction=asc&sort-param=name&page=1&view-all=true>

²⁹<https://www.businesswire.com/news/home/20200528005832/en/Internet-Grows-to-366.8-Million-Domain-Name-Registrations-at-the-End-of-the-First-Quarter-of-2020>.

³⁰<https://www.cloudflare.com/learning/dns/glossary/what-is-a-domain-name-registrar/>



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the domain name. The registrar records the transaction with the appropriate registry (based on the selected TLD) and pays the registry for the right to reserve the selected domain name. After the domain name is issued to the entrepreneur (now, the “registrant”), the registrant must direct the domain name to the appropriate IP address to display their website.³¹ It is important to note that this process does not create a website. The registrant still needs to develop a website and host the website’s content (and, if desired, set up the domain name to facilitate email). Many registrants do this using third-party vendors such as hosting providers and website development platforms.

B. Domain Name Infrastructure Is an Appropriate Place to Take Enforcement Action Against Illegal Online Pharmacies

Because the DNS is a fundamental building block of the internet’s infrastructure, it can serve as a powerful and unique choke point to stop illegal online commerce. When a domain name is suspended, it no longer resolves to the intended content.³² Consumers are unable to access the website using the domain name, and existing links using the domain name stop working (eg, links included in search results and on social media posts). For these reasons, third parties that wish to provide an up-to-date user experience often “prune” these dead links from their platforms. A planned domain name transition requires *months* of preparation and continued utilization of the original domain to smooth over the transition. For example, when NABP transitioned from *nabp.net* to *nabp.pharmacy*, the transition required a year of preparation, migration, and redundant operation to ensure that NABP successfully rolled over all digital assets.

Domain name suspension causes significant harm to illegal businesses. All financial transactions facilitated by the domain name and the website(s) that rely on it stop suddenly. If a dependent website (or an email address utilizing the domain name) is the primary form of communication between the consumer and the criminal organization, this dialogue is also abruptly terminated. Like some other online scams, an illegal online pharmacy uses its website to present a veneer of legitimacy and gain consumers’ trust. Domain name suspension provides a moment of reflection for existing clients, who may notice that something is “off” and decide to look elsewhere for their medication. In addition, many criminals in this space jockey for organic search engine result

³¹<https://www.icann.org/registrants>

³²<http://www.rysq.info/wp-content/uploads/archive/DNS-Abuse-RY-Choice-of-Action-22-March-2021.pdf>



placement, which is rendered irrelevant after the domain name is suspended and, as a result, de-indexed from organic search results. When an illegal actor is forced (by suspension) to create a new domain name, they must start this fight for search engine result placement all over again.

The domain name industry often cites hosting providers as the appropriate place to address problematic content on the internet.^{33, 34} Their rationale is that hosting providers have the closest relationship with website operators. However, it is ineffective and inefficient to shut down websites through hosting providers. A website can be hosted nearly anywhere in the world – and it can be hosted in redundancy. These redundant and decentralized hosts can be configured to immediately take over incoming traffic for any other hosting provider that stops working. The redundancy and decentralization that allows the internet to work effectively also allows criminals to evade enforcement. Thus, shutting down websites at the hosting level has little impact on criminals. By contrast, the domain name serves as a unique choke point to stop illegal online activity.

Of course, there are other choke points for illegal online pharmacies, including e-advertising platforms, search engines, and payment providers.³⁵ Action by each of these stakeholders is essential to combat illegal online pharmacies effectively. However, lock-and-suspend, when used at scale, has a meaningful impact and is difficult for criminal networks to mitigate.

C. At Scale, Domain Name Suspension Disrupts Illegal Online Pharmacies

Domain name suspension is already an industry best practice. Some registrars and registries lock and suspend domain names in response to notifications from “trusted notifiers” – subject matter experts with whom the registrar or registry has developed a relationship. Depending on their specific area of expertise, trusted notifiers report either DNS abuse or website content abuse that violates the registrars’ or registries’ policies.³⁶ For example, in 2016, the Motion Picture Association of America and the domain name registry Donuts Inc³⁷ entered into a trusted notifier agreement regarding domains engaged in large-scale movie piracy.³⁸

³³A “hosting provider” is a company that assists businesses and individuals in making their websites available through the internet.

³⁴https://dnabuseframework.org/media/files/2020-05-29_DNSAbuseFramework.pdf

³⁵See Section VI, above, for a summary of efforts by these entities.

³⁶<http://www.rysg.info/wp-content/uploads/archive/Final-CPH-Notifier-Framework-6-October-2021.pdf>

³⁷In 2022, Donuts Inc was rebranded to Identity Digital Inc.

³⁸<https://www.motionpictures.org/wp-content/uploads/2016/02/Donuts-and-MPAA-Establish-New-Partnership-2.9.16.pdf>,
<https://www.motionpictures.org/press/one-year-later-trusted-notifier-program-proves-effective/>



Likewise, since 2018, Public Interest Registry has worked with the Internet Watch Foundation³⁹ to identify child sexual abuse material (CSAM) in the .ORG registry.⁴⁰ This trusted notifier relationship has been a success, as more than 1,900 CSAM images have been removed from .ORG.⁴¹ Recently, domain name registries and registrars developed a trusted notifier framework that, while not universal or binding, provides guidance regarding the establishment of these types of relationships.⁴²

To stop illegal online drug sales, some registries have entered into trusted notifier arrangements with government agencies. Most recently, in June 2020, FDA and the National Telecommunications and Information Administration launched a 120-day trusted notifier pilot program with three internet registries (Neustar, Verisign, and Public Interest Registry) in an attempt to curb illegal online sales of unapproved opioids.⁴³ In response to notifications from FDA, the three registries agreed to take voluntary action. The pilot program led to the suspension of approximately 30 domain names associated with websites that were offering unlawful opioids for sale to US patients.⁴⁴ Of course, regulators also have the ability to seize domain names via court order; however, practical limitations (eg, resource and time constraints, as well as jurisdictional challenges) prevent court orders from being a scalable solution.

Some registrars voluntarily suspend domain names engaged in illegal online drug sales when notified by industry experts. For example, LegitScript regularly submits notifications to registrars regarding illegal online pharmacies.⁴⁵ According to a 2021 blog post, LegitScript has helped to suspend about 80,000 domain names since the onset of its domain name enforcement program.⁴⁶

The above examples demonstrate that trusted notifier relationships *can* work. Unfortunately, at this time, the number of registries and registrars who reliably take voluntary action against illegal online pharmacies is insufficient.

³⁹The Internet Watch Foundation is a UK-based charity whose mission is “to eliminate child sexual abuse images and videos online.” <https://www.iwf.org.uk/>

⁴⁰<https://dnsabuseframework.org/dns-abuse-framework-2020-retrospective.html>

⁴¹*Id.*

⁴²<https://www.rysg.info/wp-content/uploads/archive/Final-CPH-Notifier-Framework-6-October-2021.pdf>

⁴³<https://www.fda.gov/news-events/press-announcements/federal-government-announces-new-pilot-program-help-stop-illegal-availability-unapproved-opioids>

⁴⁴<https://www.ntia.doc.gov/blog/2021/ntia-fda-pilot-program-curb-access-illegal-opioids-online-delivers-promising-results>

⁴⁵LegitScript is an internet and payments compliance company that provides services for merchant monitoring, platform monitoring, and certification in high-risk industries. LegitScript is a member of the Alliance for Safe Online Pharmacies.

⁴⁶<https://www.legitscript.com/2021/05/04/rogue-internet-pharmacies-persist-through-pandemic/>



It is important to note what domain name suspension can and cannot do. Suspending a domain name prevents the registrant from directing the domain name to website content during the remainder of the domain's registration period. However, the suspension is not indefinite. After the registration period expires (and after a short cooling-off window), the domain name is again available for purchase. Also, the suspension is unable to prevent the registrant from setting up and using alternate (not suspended) domain names to direct consumers to the same problematic content that resulted in the suspension. Another issue: if a domain name is suspended by a registrar, the registrant can simply transfer the domain name to another registrar in order to bypass the suspension.⁴⁷ This creates a whole host of enforcement problems, from chasing a problematic domain name through multiple registrars, to allowing problematic registrants to cluster with enforcement-resistant registrars. In fact, one US registrar goes as far as to market itself as the "Swiss Bank of Domains."⁴⁸ Of course, if the enforcing registrar "locks" the domain name, it cannot be transferred, and this situation is prevented.

Despite the above-listed limitations, domain name suspension remains an effective tool in shutting down illegal online pharmacies. As noted above, at any given time, there are between 30,000 to 40,000 active illegal online pharmacies. When domain names are locked and suspended, consumers are unable to access illicit websites through the DNS infrastructure. This may result in a small network of websites becoming suddenly divorced from its supply of patients, or a large network being unable to route transactions through one or more anchor pages. To cause the greatest disruption to a criminal pharmacy network, lock-and-suspend should be deployed at scale. A network that relies on thousands of domain names to target consumers may not be disrupted by a few domain names going dark, but it will experience significant disruption if a substantial portion of its network needs to be suddenly rebuilt, or if its most visible domain names are targeted consistently.

⁴⁷If the suspension is issued by the registry, the registrant cannot evade the suspension via transfer.

⁴⁸<https://www.epik.com/about/>



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VIII. Examples Demonstrating How Lock-and-Suspend Impacts Illegal Online Pharmacies

To demonstrate the power of domain name suspension, the Association took an in-depth look at the estimated traffic patterns of three domain names: Domain Name A, Domain Name B, and Domain Name C. Between August 13 and August 16, 2021, LegitScript requested that each of these domain names be locked (to prevent transfer to another registrar) and suspended, and then LegitScript monitored their activity for the following 13 weeks. The first domain, Domain Name A, was observed to have been successfully locked and suspended. The notification for Domain Name B had no apparent effect and it was never observed as inactive. The third domain, Domain Name C, initially appeared to become inactive (similar to Domain Name A), but the suspension appeared to be lifted after six weeks, when Domain Name C was again found to be active.⁴⁹

Before discussing the impact of enforcement on estimated website traffic volumes, it is important to put these websites in context. While it was active, Domain Name A sold CS, including anabolic steroids and benzodiazepines (eg, Xanax[®]), as well as other prescription-only drugs, both in the US and internationally. Domain Name B and Domain Name C, both of which remain functional, sell prescription-only drugs, including CS. Domain Name C sells opioids, including oxycodone. Images follow.

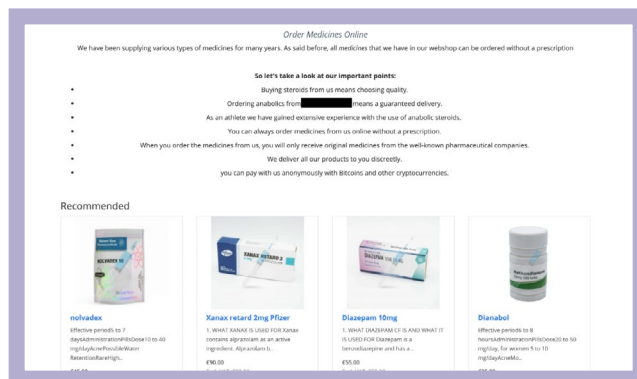


FIGURE 6: Domain Name A previously offered CS, including Xanax.

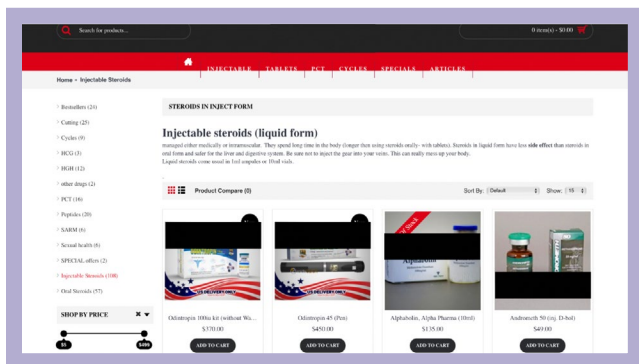


FIGURE 7: Domain Name B continues to offer injectable steroids.

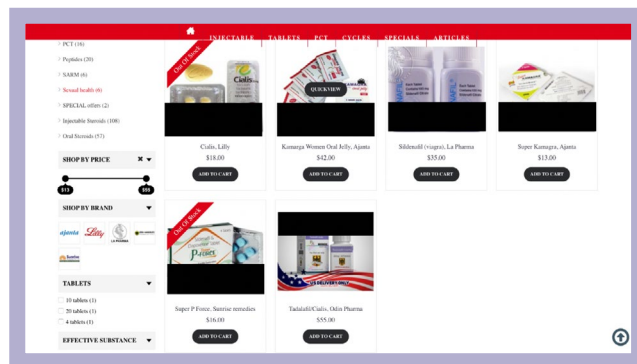


FIGURE 8: Domain Name B also offers other prescription-only drugs.

⁴⁹Domain Name A, which continues to be suspended by its registrar, is anabolenpower.com. As a harm reduction strategy, NABP is not publishing the domain names for Domain Name B and Domain Name C; however, these are available if requested by law enforcement.



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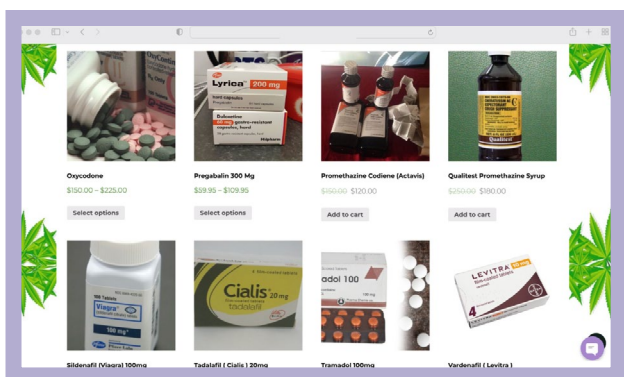


FIGURE 9: Domain Name C went offline temporarily, but then came back online. It continues to offer CS and other prescription-only drugs.

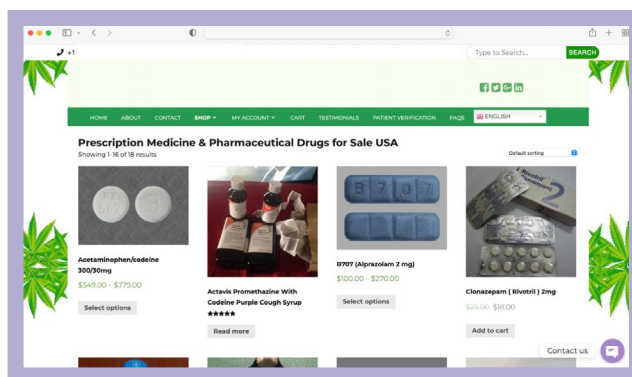


FIGURE 10: Domain Name C also offers opioids, including oxycodone.

To illustrate the impact of lock-and-suspend, it is helpful to review estimated traffic volume for each website. In August 2021, Domain Name A had between 12,247 and 23,581 estimated visits.⁵⁰ In November 2021, after the domain name was suspended, the estimated visits dropped precipitously to between zero and 28 visits. The following graph illustrates the estimated traffic for Domain Name A between March 2020 and March 2022. Please note, due to differences in estimated traffic volume, the vertical axis is normalized as a relative percentage of the domain name's highest volume month.

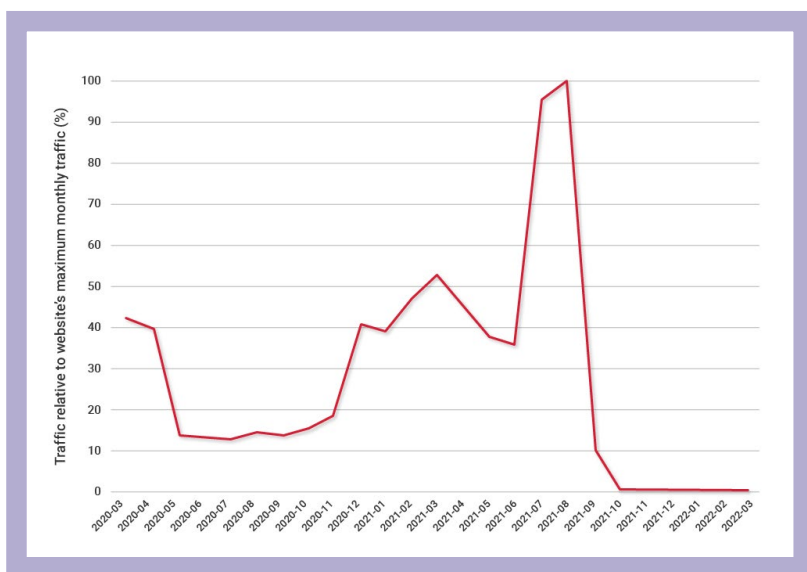


FIGURE 11: Normalized traffic patterns for Domain Name A

In contrast, Domain Name B was not suspended and, between August 2021 and November 2021, continued doing business. During that three-month period, Domain Name B experienced an estimated 68% increase in traffic.

⁵⁰NABP relied on two leading sources of traffic estimates. One utilizes a proprietary algorithm and does not disclose its methodology. The other tracks search engine results and then multiplies the frequency of a keyword being searched on Google by the relative proportion of traffic a search engine result receives, based on its placement on a search engine result page.

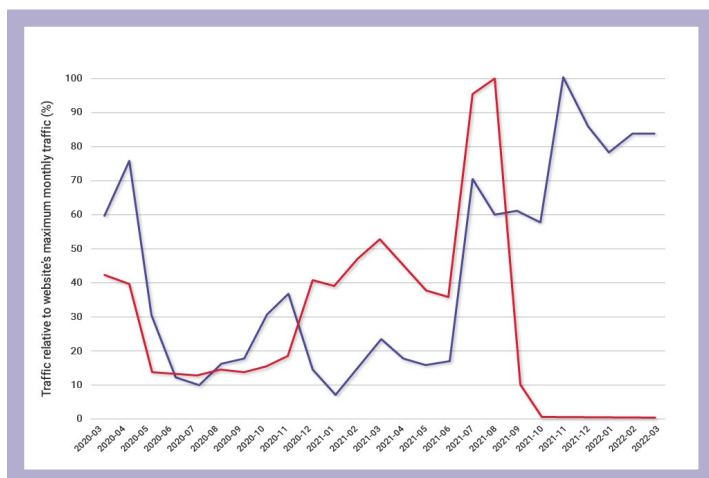


FIGURE 12: Normalized traffic patterns for Domain Name A (red line) and Domain Name B (blue line)

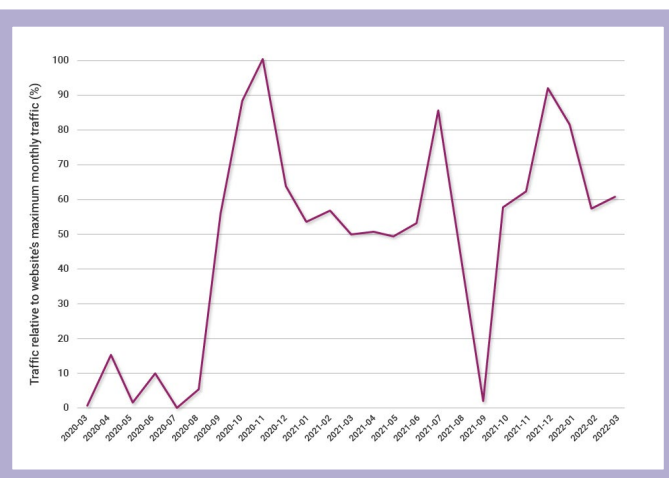


FIGURE 13: Normalized traffic patterns for Domain Name C

As a third example, Domain Name C was notified on August 16, 2021, and observed to be offline for six weeks. On October 17, 2021, Domain Name C was back online and appeared operational. As evident in the graph below, its traffic patterns rebounded quickly to pre-suspension levels. A comparison of the normalized traffic patterns for all three websites shows the impact of domain name suspension on website traffic.

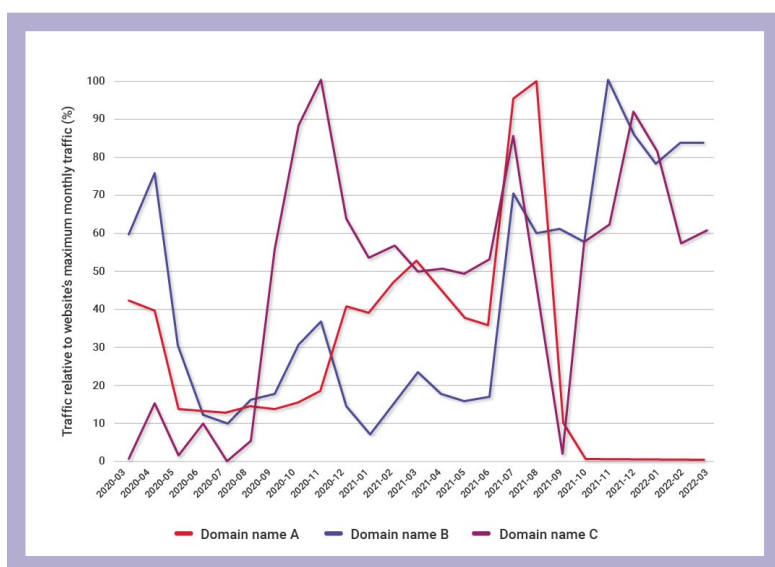


FIGURE 14: Normalized traffic patterns for all three domain names

As noted above, in the month of August 2021 alone, Domain Name A had between 12,247 and 23,581 estimated visits. Due to the enforcement action against Domain Name A, tens of thousands of future website visits will not occur. The number of unique visitors each month cannot be estimated, and it is not known how many visitors found an illegal alternative following the suspension; however, the suspension of Domain Name A significantly interrupted its business. Meanwhile, Domain Name B and Domain Name C continue to put patients at risk.



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IX. Conclusion

As demonstrated, the domain name infrastructure is an appropriate and effective place to take additional action against illegal online pharmacies. Lock-and-suspend renders dangerous websites immediately unreachable through the DNS and directly impacts patient safety. Because most illegal online pharmacies belong to large criminal networks that operate thousands of domain names in redundancy, to be effective, action must be taken at scale. When a significant number of a criminal network's domain names are suspended, the network can no longer fund its operation and it collapses. NABP applauds those domain name registrars and registries that have taken voluntary action to shut down illegal online pharmacies; however, without government intervention, there is insufficient incentive for the domain name industry as a whole to course correct. For this reason, the DNS is the right place to mandate action against illegal online pharmacies.