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Commentary

Supplying synthetic opioids during a pandemic: An early look at North America

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ABSTRACT

International commerce and travel have been restricted in order to limit the spread of COVID-19. The illegal trafficking in drugs, which is often concealed in other commercial activity, will be affected by these disruptions. This is particularly true for precursor chemicals, controlled substances of synthetic origin, and new psychoactive substances coming from Asia. China hosts large and under-regulated pharmaceutical and chemical sectors that provide many of the active ingredients used both in legitimate medicines and illicit fentanyl and methamphetamine. Unregulated producers and vendors in China have been supplying drug trafficking organizations in Mexico or using the internet and postal service to directly sell fentanyl to buyers in North America. The magnitude of supply shortages and interrupted trade of chemicals and synthetic drugs coming from China will depend on the breadth and depth of COVID-19's disruptions. In turn, this could impact vulnerable drug-using populations. Drawing on historical accounts of prior supply disruptions, this commentary offers some initial speculation as to the possible effects of COVID-19 on the supply of synthetic drugs like fentanyl and precursor chemicals supplied to North America from China, which may have important lessons for other parts of the globe. Prior supply disruptions coincided with elevated prices and reduced purities of street drugs as well as increases in the number of users entering treatment. However, it is challenging to predict how developments will unfold given the unprecedented nature of this pandemic. A short-term breakdown in supply chains, interrupted trade, or social distancing mandates may not have much of an effect on the availability of synthetic drugs. Yet, disruptions in trade for months or years could shape how drugs are supplied or used. Drug policy will need to evaluate market indicators as soon as they are available but responding now with expanded medication therapies, like methadone, may help save lives. The drug policy landscape could look different in a post-COVID world.

Introduction

Today's world is more interconnected than ever before as globalization has reduced physical and administrative barriers that impeded the movement of people and goods. The proliferation of cellular technology and internet connectivity allows individuals to communicate instantaneously anywhere in the world. The concepts of time and space have dramatically shrunk in the last half century.

It is not surprising then that the emergence of a novel virus in the interior of China has generated serious and far-reaching disruptions halfway around the world and in just a matter of weeks. The response, in particular social distancing and quarantines, has dramatically reduced international trade and travel. Such disruptions are likely to effect illegal drug markets.

Social distancing mandates have banned many types of gatherings and activities, shuttering production and commerce and straining supply chains and normal business operations. Illegal drugs are commodities, sharing similarities with other commonly traded goods, and mostly travel in the channels of legal commerce, correspondence, and transit. So it is useful to consider what effects social distancing requirements, supply shortages, travel restrictions, and closed borders will have on illegal production and exportation of drugs. In turn, such disruptions are likely to affect those that use drugs.

This commentary explores the production and sourcing of synthetic drugs, namely fentanyl and other synthetic opioids and methamphetamine, and their precursor inputs manufactured in Asia and trafficked to North America. Though other case studies of disruption of plant-based drugs are included, the focus of this piece is largely on COVID-19's possible effects on the supply of synthetic drugs and their precursors that originate and are trafficked from Asia to North America.

At time of this writing (mid-June, 2020), there is limited evidence of the virus's impacts on illegal supply chains and it is unclear if such disruptions are temporary. We explore, based on a few historical examples of other drug supply disruptions, some possible impacts on drug markets. It is extremely difficult to make projections under ordinary circumstances (who predicted North America's fentanyl problem before 2014?) and such challenges are surely more acute for a once-in-a-century pandemic. So one must caution about speculating on the possible impacts

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that a "black swan" event, such as COVID-19, could have on the supply of synthetic opioids and support services for those that use drugs. That said, the effects will depend on the duration of the disruption. If global travel and trade are restricted or slowed for months or years or if countries adopt a more inward and protectionist posture post-COVID, then one might expect more long-lasting effects.

Background

China and India are important sources of chemicals and active pharmaceutical ingredients (API) used in legitimate commerce. Decades of market-oriented reforms in China have contributed to rapid and substantial growth in the pharmaceutical sector. China's pharmaceutical industry comprises some 5,000 manufacturers that produce more than 2,000 products, with an annual production capacity of more than 2 million tons, making the country the single largest exporter of API in the world, with annual sales of more than $100 billion (World Health Organization, 2017). By volume, India is the third largest exporter of pharmaceuticals with a sector valued at $33 billion in 2017, which was projected (pre-COVID-19) to exceed $50 billion in 2020 (Bhadoria et al., 2020, India Brand Equity Foundation, 2020).

These fast-growing and high-value sectors face little regulatory scrutiny or independent oversight, allowing some companies or individuals to produce and export new psychoactive substances (NPS), and other controlled drugs, like fentanyl, or precursor chemicals. China has a history of failing to regulate its chemical and pharmaceutical sectors (Pardo, 2018). Today, some producers openly flaunt regulations or hide undetected, inexpensively manufacturing NPS, other controlled drugs, or precursor chemicals. Some producers use the internet and global commercial trade and postal systems to transact with buyers around the world (Pardo et al., 2019a). Additionally, China is a known source for Mexican traffickers of precursor chemicals used to synthetize methamphetamine and fentanyl (O'Connor, 2016; O'Connor, 2017). As late as April and May 2020, Mexican authorities seized finished fentanyl and its precursors from China that arrive by commercial cargo (LaVerdad, 2019; Espino, 2020; Vargas, 2020).

India has had its own problems overseeing businesses (Singh and Mitra, 2010); the level of regulatory corruption is extremely high (Honorati and Mengistae, 2007). The country is known to export a substantial amount of the tramadol and methaqualone consumed in many developing markets in Africa (Watanabe, 1996; UNODC. World Drug Report, 2019). It is unclear to what extent India supplies global markets with illegally exported fentanyl, but in 2018 Indian authorities disrupted two trafficking operations (DEA, 2020). Others have documented the online sales of fentanyl from India (Pardo et al., 2019b).

Learning from prior disruptions of the illegal trade in drugs

Disruptions in the illegal supply of drugs often involve dismantling trafficking rings or successfully controlling inputs or other chemical precursors. Well-known examples include the disruption of the French Connection in the early 1970s that trafficked heroin from Europe to the U.S. or the Australian Heroin Drought of early 2001 (Degenhardt et al., 2005; Musto, 1999; DuPont and Greene, 1973). Control of the precursors for methamphetamine have had substantial but short-term effects on markets (Cunningham et al., 2015; Cunningham et al., 2012; McKetin et al., 2011). Such disruptions are correlated with sharp increases in purity-adjusted prices, longer search times for drugs, increased admissions to drug treatment, and decreases in drug overdoses. Earlier disruptions were marked by bottlenecks in production or trafficking; dismantling a single producer or trafficking network had measurable downstream effects. This was even true for nascent fentanyl outbreaks in the United States going back to the 1980s. Once a lab was seized, illicitly manufactured fentanyl disappeared from street markets (Pardo et al., 2019a). Yet, most disruptions have been temporary as markets adapt by finding new sources or alternative drugs, sometimes in a matter of a few months or years (Pardo and Reuter, 2020).

However, COVID-19 is not a "traditional" disruption in the sense that trafficking networks are broken up, crops blighted, or precursors controlled; instead it impedes market activity—buyers and sellers remain but cannot transact due to public health mandates and disruptions in trade. Further, today's illegal supply of fentanyl is not limited to a single lab but an unknown number of under-regulated producers and scores of online vendors in China—none of which will be dismantled by COVID-19.

Therefore, there are limits to applying earlier supply disruptions to COVID-19. For one thing, a global disruption may inhibit the ability of markets to adapt by finding new routes, sources or alternative drugs. The world has not seen a pandemic on this scale since influenza in 1918. And that event largely took place at time when illegal markets for drugs like heroin and cocaine were in their infancy and not large by today's standards.

Wartime disruptions have impacted the legal and illegal trade in drugs and may be more applicable. Global disruption in trade during the Second World War changed the nature of illicitly supplied opiates. For the United States, the war had two important effects on illegal supply. First, it reduced trafficking of opiates from Asia, which in turn reduced the number of users. Trafficking reportedly dropped at the beginning of the War, and only slowly increased in the following years (Musto, 1999; Booth, 2019). U.S. Federal authorities documented a 90 percent decrease in the number of "addicted" opiate users from 200,000 in 1940 to 20,000 by 1945 (Booth, 2019). Courtwright notes that by the end of the war heroin "had receded from national consciousness" (Courtwright, 2001).

The second effect of the war was that cultivation of poppy relocated closer to final markets. In the case of the U.S., Mexico eclipsed Asia as the primary source of illegally manufactured poppy used for morphine or heroin (Booth, 2019; Courtwright, 2009). In 1947, poppy cultivation in Mexico grew to 4-5,000 hectares (Courtwright, 2009), or a little less than total cultivation estimated by the U.S. government for 2013 (ONDCP, 2019). The war disrupted legitimate trade in opium as well. French colonial authorities encouraged poppy cultivation in Laos and Vietnam, which were virtually free of poppy, after losing access to sources in India and Afghanistan (Booth, 2019, Lintner, 2000).

Depending on the duration of the disruption, one might imagine COVID-19 to have mixed effects. There may be immediate yet temporary effects in the supply of drugs as production is shuttered and trade limited during quarantine. Yet, like wartime disruptions that affect broad swaths of legal trade and travel, a pandemic may realize long-term structural changes in illegal synthetic drug markets should disruptions be severe and sustained.

COVID-19's disruptions so far

Production

The large and under-regulated chemical and API sectors in China and India servicing the illegal drug markets may escape regulatory oversight but are subject to enforceable public health mandates aimed at stemming the spread of COVID-19, like quarantines and work from home orders. This is particularly important in the case of China. The city of Wuhan, where the novel coronavirus was first identified in late 2019, is China's tenth-most populous city and an important hub for pharmaceutical and chemical manufacturing in that country (China Highlights, 2020; Zhang, 2013; Pharmaceutical Technology, 2020).

Public health measures were first implemented by China but have been adopted elsewhere as the disease spreads. By late January 2020, Chinese authorities implemented "unprecedented" social controls in Wuhan and the rest of the Hubei province, quarantining the entire area and locking down tens of millions of residents in their homes (Reuters. Wuhan lockdown "unprecedented", 2020).

These measures have had direct impacts on the production of API and chemicals coming from China. It remains to be seen if any of these disruptions in production will be long lasting, but by late February, government agencies in the United States and Europe were reporting shortages of medicines, API, and other medical equipment due to supply constraints in China stemming from public health measures (EMA, 2020; FDA. Coronavirus 2020; Guarascio, 2020; Harney, 2020). According to media accounts, manufacturers in China were forced to close during quarantines and have been slow to return to full capacity as labor shortages impede a return to pre-closure supply levels (Harney, 2020; McCarthy, 2020). Six weeks after the government-imposed quarantines and lockdowns, about 40 percent of small and medium-sized manufacturers across all sectors of the economy had returned to normal operations (Lo, 2020). Another wave of infections could close manufacturers again.

Though these firms produce chemicals and API used in legitimate articles of commerce, some may also produce precursors or finished product for drugs like fentanyl and methamphetamine (Pardo, 2018). By one account, a single company in Wuhan was, until recently, suspected to be the dominant source of fentanyl precursors (Westhoff, 2019). It is hard to disentangle legal production from illegal or under-regulated production of synthetic drugs and precursor chemicals as Chinese authorities have a hard time regulating these industries. According to recent government reports, in 2017 Chinese regulators inspected a mere 15 manufacturers of controlled substances or precursors; of those three did not pass for failure to properly handle mailing and transportation certificates or failure to control samples (Pardo, 2018). Therefore, the disruption in legal production brought about by the virus is likely to have spillover effects on illegal production of finished drugs or their precursors.

Trafficking

The response to this novel public health threat includes other restrictions on the movement of people and goods, such as the closing of borders or ports of entry. Global container shipping, airline cargo, and commercial travel services have been affected by COVID-19. The World Trade Organization expects disruptions from COVID-19 to reduce global trade by 13-32 percent in 2020 (World Trade Organization, 2020). Ports in China, the U.S. and Europe have reported declines in cargo shipping activity (Sevastopulo et al., 2020). By one estimate, China's port association projects a 10-15 percent decline in forecasts for the second quarter of 2020, while February's figures suggested a 20 percent contraction from the prior year (Leng, 2020). Meanwhile, the International Air Transport Association has reported that, as of April 2020, over 50 airlines have suspended service with another 160 reporting other disruptions due to COVID-19 (FDA, 2020). Many of these airlines transport commercial passengers as well as air cargo and postal correspondence.

Reductions in trade and transport are likely to have effects on illegal drug supply as precursor chemicals and other finished synthetic products are often conveyed from Asia to other parts of the world by commercial cargo and post (Pardo, 2018; DEA, 2019). The disruption may have varied effects by type of drug. Until recently, fentanyl and other potent synthetic opioids were sent to the United States by post; in 2018 approximately 70 percent of the purity-adjusted amount of fentanyl entering the U.S. was seized arriving by air from China in postal or consignment carrier facilities (Pardo et al., 2019a).

However, the potency of some synthetic opioids may shield them from broad disruptions in supply as a nearly pure kilogram (which may yield up to a million doses) can be posted from China directly to buyers in North America. However, the supply of bulkier precursor chemicals, especially for methamphetamine, that are often sent by cargo, may face some additional disruptions during the initial period of the pandemic. Nevertheless, the movement of hundreds of tons of precursors can remain concealed in legitimate cargo. Lazaro Cardenas, Mexico's busiest Pacific port, handled just over 19 million tons of imports in 2019 (Secretaria de Comunicaciones y Transportes, 2019). This suggests that even a fifty percent contraction in imports would still allow many opportunities to conceal precursors among other legitimate goods. Unlike during the Second World War when shipping lines were completely cut off, COVID-19 is likely to reduce rather than sever such connections. In short, disruptions may have limited effects on the supply of synthetic drugs or precursors.

Border closures will also impact trafficking. Since late-March, the United States, Canada, and Mexico limited border crossings to essential trade and individuals with certain work visas, denying access for personal reasons, such as tourism (Romo, 2020; Department of Homeland Security, 2020). The majority of Mexican-sourced heroin, and perhaps fentanyl, enters the U.S. through the Southwest border by privately owned vehicles, followed by concealments in legitimate goods on tractor-trailers (DEA, 2018). The numbers of personal vehicles and trucks crossings into the U.S. from Mexico has fallen by half, from 6.2 million in March and April 2019 to 3.1 million in the same months of 2020 (Bureau of Transportation Statistics, 2020). Closing ports of entry may elevate traffickers' risks as there are now fewer overall crossings—none of which are for personal or tourist purposes, meaning that those crossing must have proper documentation and a reason to enter the United States. Fentanyl is smuggled into the United States from Mexico, but in large amounts of low purity–often 5-10 percent pure (Pardo, 2018; CBP, 2019). Moving bulkier drugs, like methamphetamine or impure fentanyl, across the Southwest border at this time may incur additional risks to traffickers as fewer total crossings may allow customs agents to be more rigorous when screening vehicles.

Supply shortages from disruptions in production or transshipment as well as reduced trafficking flows from expanded border restrictions may raise the price of drugs sold in North America. For example, producers in Asia may raise the wholesale price of precursors or finished product during immediate disruptions. Applying the risks and prices framework put forward by Reuter and Kleiman (Reuter, 1986), traffickers that face increased risks of detection or harm may also seek greater compensation by raising the import price of a kilogram of methamphetamine or fentanyl.

Limited evidence of disruption

It is clear that COVID-19 has disrupted international commerce and travel, which will generate effects on the illegal trade in drugs coming from China or trafficked from Mexico. That said, there is little empirical data to quantify or determine the disruptive effects of COVID-19 on the drug trade. Drug policy data collection and analysis systems, like drug seizure and overdose death data often lag—sometimes by a year or more. Drug policy analysts and scholars will need to examine these data as they are made available. Key indicators, such as purity and price, can help determine if and how disruptive COVID-19 is to drug trafficking and retail, that is, of course, if social distancing and quarantines do not interfere with routine undercover buys made by law enforcement.

Monthly seizure data through May 2020 at ports of entry reported by U.S. Customs and Border Protection have not shown a clear decline in the quantity of synthetic drugs, like methamphetamine or fentanyl, derived from inputs from China. This might be due to mere variation in enforcement activity or to stockpiling of precursors or finished product by traffickers to attenuate the shocks of large seizures or bad growing seasons (Kraeutler, 2008; Paoli et al., 2009). The practice of drug trafficking organizations (DTOs) stockpiling inventory is common. In mid-2018, Mexican authorities seized a 50-ton stockpile of methamphetamine near a clandestine lab (O'Boyle, 2018), suggesting that DTOs could be holding enough inventory to meet demand in the face of supply constraints for several months. Similarly, online fentanyl vendors boast having warehousing facilities in Europe and the United States (Pardo et al., 2019b).

Available border seizure data are too noisy to allow anyone to draw a reliable conclusion. Wholesale price data are not collected or reported systematically. The most often cited figures in the media come from

law enforcement sources. Recent news stories note that drug traffickers are charging higher prices for synthetic drugs from China (Mustian and Bleiberg, 2020). Nonetheless, fentanyl from China continues to be seized in Mexico; as late as April 2020 nearly 50 kilograms of fentanyl (purity unknown) were discovered arriving by air to Mexico City from Hong Kong (Espino, 2020) and another 170 kilograms of precursors arrived by container ship from China at the end of May (Vargas, 2020).

How medium- to long-term disruptions may shape the future

Again, one must caution as to speculating about COVID-19's possible effects on the illegal trade in drugs. It is unclear how long social distancing and public health mandates that restrict trade and travel will remain in place. Short-term disruptions may be quite temporary as firms in China resume operations, trade rebounds, and DTOs draw from stockpiles. That said, medium- to long-term disruptions, should they occur, may have structural effects on how suppliers operate.

Suppliers may attempt to overcome long disruptions and other constraints due to social distancing and travel restrictions. As was seen with poppy production during the Second World War, this may include increased efforts to move production closer to final markets or adopting alternative sources of primary inputs. From the 1980s through the early 2000s, there were about a dozen documented instances of clandestine fentanyl production in the United States (Pardo et al., 2019a), suggesting that there is no structural reason why illicit fentanyl manufacture must occur abroad. Eager to avoid supply constraints, Mexican DTOs may try to diversify their sources of precursor chemicals used for synthetic drugs, looking to countries that have not experienced severe shortages in production capacity. DTOs may attempt to reduce the impacts of border closures by stockpiling larger amounts of finished product closer to final markets. Fentanyl importers in the U.S. may also seek to diversify their online sources, looking to suppliers outside of China.

Mexican DTOs involved with fentanyl production and trafficking may innovate smuggling tactics to penetrate closed borders by tunneling or using remote controlled drones to deliver compact parcels of potent synthetic opioids. Tunneling under the border is not new; between 1990 and 2015, 183 illicit border tunnels were discovered (Department of Homeland Security, 2016). In early 2020, authorities discovered the longest recorded cross-border tunnel that spanned 1.2 km in length (Bellware, 2020). Use of drones has been reported, but this contributes to a tiny fraction of smuggled drugs given their minute payloads (BBC, 2015). DTOs may also attempt to circumvent the border entirely by moving synthesis to the United States; the parallel with cannabis cultivation by Mexican DTOs on federal lands in the U.S. is one example (Westervelt, 2019).

Policy going forward

There is little empirical evidence that COVID-19 has substantially disrupted the supply of precursor chemicals and synthetic drugs from China or trafficked from Mexico. China's large and under-regulated chemical and pharmaceutical sectors have been impacted by public health measures aimed at slowing the spread of the disease, but production appears to be resuming. Global trade has fallen, but compact and potent synthetic opioids are likely to be shielded from contractions in shipping and commerce.

Should COVID-19 prove to be more disruptive than past drug supply disruptions, then policy should work to ameliorate the harms from sudden shortages and social distancing mandates (e.g., withdrawal, acute overdose, etc.) while leveraging opportunities to intervene in dislocated markets. Those who use drugs may face elevated risks and pressures if COVID-19 disrupts supply for an extended period of time. Some individuals may seek out treatment. Health care and drug treatment providers in the United States and Europe have started to relax restrictions on medication therapies, acknowledging the increased pressure and isolation that social distancing brings (EMCDDA, 2020; SAMHSA, 2020). However, drastic supply shortages in drugs like heroin or fentanyl or the decline in street dealing may increase demand for methadone and buprenorphine. Authorities should take this opportunity to expand access to medication therapies and getting individuals into the drug treatment system. Similarly, disrupted retail markets may struggle to maintain their presence under social distancing mandates and quarantines. A softening of such markets, especially in entrenched parts of a city or town, may allow law enforcement an opportunity to dislodge dealers and distributors.

It is difficult to predict the effects that COVID-19 and its ensuing disruption may have on the global drug trade. Given the number of chemical and pharmaceutical manufacturers in Asia, the ability with which chemicals and finished synthetic drugs can be easily concealed in legitimate trade, and the creativity and preparation of DTOs, one should expect that supply disruptions will likely be limited. Nonetheless, it is very likely to have some measure of impact—especially on the most vulnerable. Therefore, drug policy will need to consider the potential outcomes that the disease could have on drug-using populations and on the illegal trade in drugs. The drug policy landscape may look very different in a post-COVID world.

Declarations of Interest

None.

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