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THESIS

**PILLS, POWDERS, AND OVERDOSE: AN ANALYSIS
OF AMERICA'S ILLICIT FENTANYL CRISIS**

by

Timothy C. Heiser

March 2020

Thesis Advisor:

Mollie R. McGuire

Second Reader:

Richard D. Bergin IV

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**PILLS, POWDERS, AND OVERDOSE:
AN ANALYSIS OF AMERICA'S ILLICIT FENTANYL CRISIS**

Timothy C. Heiser
Assistant Fire Chief, Fort Lauderdale Fire Rescue
BS, Regis University, 1990

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March 2020**

Approved by: Mollie R. McGuire
Advisor

Richard D. Bergin IV
Second Reader

Erik J. Dahl
Associate Professor, Department of National Security Affairs

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ABSTRACT

Illicit fentanyl and its analogs are the most substantial synthetic opioid threat that North America faces, and there is no indication that the threat will decrease in the near future. Illicit fentanyl is a synthetic opioid that is, at a minimum, 50 to 100 times stronger than morphine and responsible for the exponential increase in overdoses and overdose deaths in recent years. Illicit fentanyl and its analogs are being mixed with drugs such as cocaine and heroin and have been found disguised in counterfeit prescription pills. Data suggest that many drug users are unaware of the illicit fentanyl in the drugs they consume. The illicit fentanyl threat affects communities nationwide by depleting public health, public safety, and financial resources. This thesis seeks to present the illicit fentanyl crisis by providing its history and describing the manufacturing, trafficking, and distribution of illicit fentanyl and the effects it has on communities and community resources. Illicit fentanyl and its analogs have become an epidemic in North America that continues to spread like an infection. Policy must be implemented and success measured to prevent the infection from becoming a terminal illness.

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LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|----------|----------------------------------------------|
| CDC | Centers for Disease Control and Prevention |
| D.A.R.E. | Drug Abuse Resistance Education |
| DEA | Drug Enforcement Administration |
| DTO | drug-trafficking organization |
| EMS | emergency medical services |
| FDA | Food and Drug Administration |
| LEAD | Law Enforcement Assisted Diversion (Program) |

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EXECUTIVE SUMMARY

There is one forewarning that must be put forward regarding this monograph: the illicit fentanyl crisis in North America is extremely dynamic. The information presented herein is a generalization of the national crisis. While some areas of North America have successful plans in place to address the illicit fentanyl crisis, other areas have yet to experience the crisis to the extent mentioned in this thesis.¹ However, the findings presented and the policy recommendations that follow are based on the most current trending information available and, as a whole, are meant to inform and advise practitioners in addressing the illicit fentanyl crisis individually instead of as part of North America's drug crisis.

The drug that is fueling the current opioid crisis is *illicit* fentanyl. For this research, the term illicit fentanyl refers to all illegally produced synthetic opioids and opioid analogs. Illicit fentanyl is a synthetic opioid like morphine.² Illicit fentanyl is 50–100 times more potent than morphine and 30–40 times more potent than heroin.³ The potency varies as illicit fentanyl is not produced following any governmental laws or guidelines. Street names for fentanyl include, but are not limited to, Apache, China White, Dance Fever, Goodfella, and Jackpot.⁴ Illicit fentanyl is made in laboratories unlike opioids, such as heroin and morphine, which are derived naturally from the poppy plant.⁵

¹ Drug Enforcement Administration, *2018 National Drug Threat Assessment*, DEA-DCT-DIR-032-18 (Washington, DC: Department of Justice, October 2018), <https://www.hsdl.org/?view&did=818528>.

² Katarzyna Kuczyńska et al., "Abuse of Fentanyl: An Emerging Problem to Face," *Forensic Science International* 289 (August 2018): 207–14, <https://doi.org/10.1016/j.forsciint.2018.05.042>.

³ Julie Worley, "A Primer on Heroin and Fentanyl," *Journal of Psychosocial Nursing & Mental Health Services* 55, no. 6 (June 2017): 16–20, <https://doi.org/10.3928/02793695-20170519-02>.

⁴ "What Is Fentanyl?," National Institute on Drug Abuse, last modified February 2019, <https://www.drugabuse.gov/publications/drugfacts/fentanyl>.

⁵ Worley, "A Primer on Heroin and Fentanyl."

Illicit fentanyl and its analogs are becoming more widely available in North America.⁶ Illicit fentanyl use is on the rise, and in many cases, those ingesting the drug are unaware of its presence as the fentanyl is pressed into counterfeit “look alike” pills that appear as over-the-counter prescription medications. Current drug intervention and educational programs do not address or warn about illicit fentanyl, leaving many people unaware that there is a crisis and that—even if they do not use drugs—the epidemic may affect them.

The increased presence of illicit fentanyl and its analogs will continue to present significant threats to North America’s national security, including fire rescue and emergency medical services, law enforcement, and public health entities. The aforementioned fields have been required to change operational policy and procedures to protect themselves on the frontline from inadvertent exposure to this dangerous substance.⁷ Law enforcement agencies across the country now carry the drug naloxone to reverse the harmful effects of exposure to themselves or citizens of the communities they serve. The Centers for Disease Control and Prevention and the Drug Enforcement Administration now offer classes for first responders on the dangers of illicit fentanyl exposures, what to do to prevent exposure, and how to act in the event of an accidental exposure.⁸

Costs from the illicit fentanyl crisis continue to rise and are affecting communities across North America. Communities have been forced to purchase new personal protective equipment for their first responders. The equipment comes with the associated costs of training, maintenance, and replacement. Drugs used to reverse the effects of opioids such as morphine and heroin, specifically the drug naloxone, have risen in price exponentially due to the slow supply and high demand of products to counter the introduction of illicit fentanyl to the marketplace.

⁶ Drug Enforcement Administration, *2018 National Drug Threat Assessment*.

⁷ “Illicit Drugs, Including Fentanyl,” Centers for Disease Control and Prevention, February 11, 2020, <https://www.cdc.gov/niosh/topics/fentanyl/risk.html>.

⁸ “DEA Warning to Police and Public: Fentanyl Exposure Kills,” Drug Enforcement Administration, June 10, 2016, <https://www.dea.gov/press-releases/2016/06/10/dea-warning-police-and-public-fentanyl-exposure-kills>.

Efforts to prevent Chinese-manufactured fentanyl from arriving in the United States have generally been unsuccessful. Much of this problem is due to sellers needing only a small amount of concentrated fentanyl to transform into a massive cache of counterfeit pills or mix with heroin. Overdoses in the United States and Canada have risen 30 percent or more from 2012 to present.⁹ Current educational programs must be updated and targeted to the specific audience vulnerable to illicit fentanyl use. Furthermore, existing programs in place to keep first responders safe must also include providing the tools and technology to detect illicit fentanyl and its analogs before possible exposure and distribution. It is likely that the implementation of harm-reducing strategies will redirect users from taking fentanyl-laced products, thus making the market less profitable for the sellers and reducing the risk to the community as a whole.

⁹ Kuczyńska et al., “Abuse of Fentanyl.”

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I. INTRODUCTION

A. PROBLEM STATEMENT

Illegal fentanyl use has been on the rise in the United States. In fact, the Centers for Disease Control and Prevention (CDC) report that illicit fentanyl overdose deaths increased over 600 percent from 3,105 in 2013 to approximately 20,000 in 2016.¹ The Drug Enforcement Administration (DEA) recognizes the illicit drug as a danger to users, first responders, and communities of all sizes.² Illicit fentanyl overdoses deplete community resources and inhibit or reduce the first responders' ability to respond to other emergencies in a timely manner. The negative impacts, such as increased response times, pharmaceutical prices, and equipment costs, felt by communities can be directly correlated with an upsurge in fentanyl overdoses.³ In fact, according to the CDC, there was a 29 percent increase in overdose transports to emergency rooms from July 2016 to September 2017.⁴ Current programs do address the illicit fentanyl crisis; however, significant gaps in the programs reduce their success in the community and with addicts. Illicit fentanyl and its analogs are a significant threat to first responders and the communities they support. While some programs have mitigated this threat, they have had been minimally effective, and if nothing is done to curb fentanyl's use and popularity, this trend of addiction and overdose will likely continue.

¹ Julie K. O'Donnell et al., "Deaths Involving Fentanyl, Fentanyl Analogs, and U-47700—10 States, July–December 2016," *Morbidity and Mortality Weekly Report* 66, no. 43 (2017), <https://doi.org/10.15585/mmwr.mm6643e1>.

² Drug Enforcement Administration, "Fentanyl Remains the Most Significant Synthetic Opioid Threat and Poses the Greatest Threat to the Opioid User Market in the United States," DEA-DCT-DIB-003-18 (Washington, DC: Drug Enforcement Administration, May 2018), <https://www.hsdl.org/?view&did=818578>.

³ Celia Vimont, "Featured News: Need for Multiple Naloxone Doses on the Rise," Partnership for Drug Free Kids, January 11, 2018, <https://drugfree.org/learn/drug-and-alcohol-news/featured-news-need-multiple-naloxone-doses-rise/>.

⁴ Alana M. Vivolo-Kantor et al., "Vital Signs: Trends in Emergency Department Visits for Suspected Opioid Overdoses—United States, July 2016–September 2017," *Morbidity and Mortality Weekly Report* 67, no. 9 (2018), <http://dx.doi.org/10.15585/mmwr.mm6709e1>.

1. Fentanyl Defined

For this research, there are two types of fentanyl: illegal, commonly referred to as illicit, and legal fentanyl. Illicit fentanyl is manufactured in clandestine labs and does not adhere to any federal or medical regulations regarding strength, content, or mixing agents. Illicit fentanyl is either smuggled into the United States as a premixed drug or illegally imported as separate ingredients and mixed upon arrival to the country. Legal fentanyl refers to fentanyls that are prescribed by doctors and administered by paramedics and other health care professionals under the strict guidance of a physician. All types of fentanyl are potent synthetic opioids.⁵ Fentanyl's effects are similar to morphine's; however, fentanyl is much stronger, and in the case of illicit fentanyl, the strength is unknown due to the lack of regulation.⁶

Fentanyl was first introduced in the 1960s under the drug name Sublimaze, and it was used legally as an aid during anesthesia and for the pain management of bone cancer patients.⁷ Fentanyl was a useful synthetic opioid as it did not have some of the uncomfortable side effects of morphine such as nausea and vomiting. However, in 2006, illicit fentanyl use spiked in several major cities in America.⁸ The sudden rise in illicit fentanyl consumption within the United States has been attributed to several factors, including the popularity of OxyContin in the 1990s; the sudden crackdown on legal pain management clinics, also referred to as "pill mills," where doctors sold narcotics directly to people for cash; and the lack of an inexpensive alternative to replace OxyContin. These trends were further exacerbated by the failure of clinicians and legislators to realize that

⁵ Julie Worley, "A Primer on Heroin and Fentanyl," *Journal of Psychosocial Nursing & Mental Health Services* 55, no. 6 (June 2017): 16–20, <https://doi.org/10.3928/02793695-20170519-02>.

⁶ Bradley Ray et al., "Examining Fatal Opioid Overdoses in Marion County, Indiana," *Journal of Urban Health* 94, no. 2 (April 2017): 301–10, <https://doi.org/10.1007/s11524-016-0113-2>.

⁷ Kirsten Forseth, "Fentanyl and Overdose: Harm Reduction Strategies" (webinar, Maryland Department of Health and Mental Hygiene, December 20, 2016), [https://bha.health.maryland.gov/NALOXONE/Documents/BHA%20Webinar%20Fentanyl%20and%20Overdose%20Harm%20Reduction%20Strategies%2012.20.16%20\(1\).pdf](https://bha.health.maryland.gov/NALOXONE/Documents/BHA%20Webinar%20Fentanyl%20and%20Overdose%20Harm%20Reduction%20Strategies%2012.20.16%20(1).pdf).

⁸ "Fentanyl and Opioid Crisis," Homeland Security Digital Library, accessed March 4, 2019, <https://www.hsdl.org/?collection&id=86623>.

reasonable treatment was needed for those addicted to the drug, whether it be through counseling, detox, or a substitute medication to reduce the difficulty of becoming sober. Heroin became the quick alternative for those who were addicted to the pain medication OxyContin, which was no longer available. The introduction of fentanyl and illicit fentanyl soon followed as they were an inexpensive alternative. Yet, fentanyl, if not prescribed, is unlawful to possess and ingest in the United States, so the illicit fentanyl market grew.

2. Impact of Illicit Fentanyl on Communities

Many people who have used fentanyl are not aware that they have purchased and ingested the synthetic opioid. In fact, the DEA reported in 2016 that two-thirds of all fentanyl overdoses are a result of the drug being pressed into a pill form and ingested by users who think they are taking an illegally purchased prescription medication from a friend or dealer.⁹ Pill presses are easily purchased on internet websites such as Amazon, eBay, or Craig's List. Pill presses are not regulated and can easily be used to manufacture counterfeit pills by mixing illicit fentanyl with drugs, such as tramadol, diazepam, or aspirin, among other substances, to create a perfect replica of an over-the-counter medicine.¹⁰ The manufacture and distribution of these counterfeit fentanyl pills, and the fact that the medications are being purchased and ingested, are of serious concern. Presumably, any drug not prescribed by a physician or purchased legally from a pharmacy may be the deadly drug fentanyl.

The use and possession of illicit fentanyl do not only affect those who purchase and distribute the drug. Entire communities are involved. For example, the price of the drug naloxone has increased 464 percent from 2012 to 2016 in South Florida. This increase can be attributed to the demand created when law enforcement began to carry the medication to treat overdoses and the health department began distributing the drug to addicts at no

⁹ Drug Enforcement Administration, "Counterfeit Prescription Pills Containing Fentanyls: A Global Threat," DEA-DCT-DIB-021-16 (Washington, DC: Drug Enforcement Administration, 2016), <https://www.dea.gov/sites/default/files/docs/Counterfeit%2520Prescription%2520Pills.pdf>.

¹⁰ Drug Enforcement Administration.

cost to prevent overdoses.¹¹ Illicit fentanyl also threatens the lives of first responders and those who live with or near concealed laboratories and clandestine pill mills.¹² Fentanyl, in any form, poses a daily threat to first responders as there are many ways in which it can be absorbed into the body. First responders across the country have already experienced serious exposures, many of which could have been deadly.¹³ The U.S. government, recognizing the job hazards faced by first responders caused by illicit fentanyl, has produced safety videos and guides to assist in preparing for fentanyl exposure.¹⁴ These safety guides have been distributed nationally, and information continues to be distributed on the subject.

3. Current Mitigation Efforts

The United States has a fentanyl crisis, and communities throughout the country have begun to respond. Different strategies and programs have been put in place to inform drug users as well as the community as a whole.¹⁵ Previous methods of prevention must be examined before users are exposed to the drug and become addicted.¹⁶ Some methods of drug prevention, such as Drug Abuse Resistance Education (D.A.R.E.), have resulted in conflicting outcomes. The effectiveness of current intervention programs in place nationally and abroad, as well as the target audience of these programs, needs to be

¹¹ Jake Harper, “Antidote for Opioid Overdoses Often Is Difficult to Obtain,” *Indianapolis Business Journal* 39, no. 11 (2018): 24A–25A, ProQuest.

¹² “Risks of Occupational Exposure to Synthetic Opioids (e.g. Fentanyl) for First Responders,” Fentanyl Safety for First Responders, accessed March 4, 2019, <https://www.fentanylsafety.com/>.

¹³ Robert Burke, “The Dangers of Synthetic Opioids,” *Firehouse* 42, no. 9 (September 2017), ProQuest.

¹⁴ Drug Enforcement Administration, *Fentanyl: A Briefing Guide for First Responders* (Washington, DC: Department of Justice, 2017), https://www.iaclea.org/assets/uploads/pdfs/Fentanyl_BriefingGuide_June2017.pdf.

¹⁵ Richard G. Frank and Harold A. Pollack, “Addressing the Fentanyl Threat to Public Health,” *New England Journal of Medicine* 376, no. 7 (2017): 605–7, <https://doi.org/10.1056/NEJMp1615145>.

¹⁶ Marjorie E. Kanof, *Youth Illicit Drug Use Prevention: DARE Long-Term Evaluations and Federal Efforts to Identify Effective Programs*, GAO-03-172R (Washington, DC: Government Accountability Office, 2003), <https://www.gao.gov/products/GAO-03-172R>.

reconsidered.¹⁷ Dissecting and explaining the import, distribution, community effects, and impact on emergency response systems are imperative to improve awareness and the ability to solve the fentanyl crisis.

B. PURPOSE STATEMENT

The purpose of this thesis is to examine the current illicit fentanyl crisis and offer policy recommendations that recognize the current problem and the effects it has on communities. Furthermore, this thesis recommends actions that could be useful in the mitigation of the illicit fentanyl issue in communities, first at the local level and then at the national level. After the implementation of recommendations, if long-term data regarding fentanyl-involved overdoses show a decrease in the drug's effect on communities, it might suggest that the recommended policy implementation was a factor in fentanyl's loss of popularity, usage, and decrease in the number of overdose fatalities.

This research addresses the current illicit fentanyl crisis specific to North America. Illicit fentanyl use is often confused or combined with heroin and legal prescription drug abuse, which creates an environment in which communities either under- or over-report the prominence of the drug and its analogs. This thesis defines illicit fentanyl and its analogs, using a who, what, when, where, and why approach to the issue. The goal is to clarify the current illicit fentanyl crisis, understanding that knowledge of an issue creates an environment to create solutions that treat the targeted problem rather than the symptoms. For example, giving out free naloxone may prevent overdose deaths, which are the symptom of the crisis. However, the main problem is addiction and the prevalence of illicit fentanyl. Prior illicit drug problems and related mitigation strategies suggest that without a deep understanding of the problem and related intervention strategies, the problem in many cases will continue to spread. The goal of this thesis is to present information to help develop a cure.

¹⁷ Kanof.

C. RESEARCH QUESTIONS

Illicit fentanyl use in America is an issue that needs further examination, and current policies for treating overdoses rather than preventing them must be revisited. The government currently knows that there is an illicit fentanyl crisis; however, the understanding of where the drug comes from and how and why so many people are overdosing is unclear, and what is known is poorly communicated. Some communities are implementing measures to stop the overdose problem. Some focus on the user end of the transaction through education while others focus on the seller through stricter policing. Some communities do not even test their overdose victims for the presence of illicit fentanyl; they assume that any opioid overdose is fentanyl. To respond to this problem, this thesis answers the following questions:

1. What is the current situation regarding the illicit fentanyl problem?
2. What are the effects of fentanyl on communities and community resources?
3. What policy changes can be implemented to make more people aware of the dangers and prevalence of fentanyl and the programs in place to treat those addicted to the drug?

D. RESEARCH DESIGN

Illicit fentanyl overdoses have risen to the level of a national crisis. Public safety entities are aware of the term “fentanyl crisis,” but few realize how and why it is a crisis, how the crisis started, how illicit fentanyl is imported and distributed, who the users are, and how they became addicted. Subject-matter experts have written about the topic of illicit fentanyl, but few have tied all the information into one readable, understandable document.

This thesis identifies and describes the current illicit drug fentanyl crisis and educates readers about possible policy changes to create greater awareness of the prevalence and dangers of the problem. It also examines and utilizes existing programs designed to treat those who are addicted to fentanyl. Eradicating illicit fentanyl use in its entirety is an unrealistic expectation and, therefore, not addressed in this thesis. Programs

and practices that have already been implemented around the country and around the world were analyzed for their successes and failures to inform changes to existing policies or the development of new ones.

1. Methodology

A systematic review of the literature was the primary method of research used to answer the three research questions. This method was selected as it could incorporate the past and present situation involving the growth and spread of illicit fentanyl and its analogs. The research revealed information that charted the inception of illicit fentanyl use as well as the current situation regarding the crisis. Timely government documents provided insight into trends in illicit fentanyl use, documenting the rise of new fentanyl analogs and the areas where they have become popular. Current journals and peer-reviewed documents that describe the effects of illicit fentanyl on communities were used to present the most up-to-date situation regarding the use of the drug and offer insight into the reasons illicit fentanyl has become a popular choice for illegal drug distributors. Moreover, existing drug programs were systematically reviewed for success and failure rates to examine program effectiveness, areas for improvement, and the need for entirely new drug treatment programs. Consequently, the methodology utilized for this thesis presented a comprehensive history and timeline that shows the effects of illicit fentanyl on communities, the present situation of the crisis, and possible solutions to make communities more aware of the problem, thus enabling them to recognize the need for action.

2. Data Collection

This thesis explores existing research to explain the illicit fentanyl crisis from its beginning to the present day. Speculation surrounding this data might suggest that the current trend of misuse and overdose will continue unabated.¹⁸ The scope of this thesis includes a history of the illicit fentanyl crisis and recent trends. Medical journals have been

¹⁸ Drug Enforcement Administration, *2018 National Drug Threat Assessment*, DEA-DCT-DIR-032-18 (Washington, DC: Department of Justice, October 2018), <https://www.hsdl.org/?view&did=818528>.

used to define what the drug is and how it works; however, there is little mention in these journals of the varying strengths of unregulated illicit fentanyl. Evidence of an illicit fentanyl crisis has been gathered using reports from the DEA, the CDC, and other government agencies as well as journals and independent peer-reviewed studies. These sources have been retrieved from the Homeland Security Digital Library, Google Scholar, and ProQuest among other academic and government databases. Data and trends have been collected from these and other reputable sources.

3. Analysis

Data analysis for this thesis involved the researcher's reviewing of relevant trends and topics. The information was organized to inform the reader of how and why illicit fentanyl and its analogs have become as prevalent as they are today. This was accomplished by reviewing charts and graphs provided in the research as well as comparative studies across the United States and Canada, primarily using an investigative and evaluative approach.¹⁹

The research question regarding policy change, drug awareness, and treatment was analyzed by evaluating the current illicit fentanyl problem and the causes of the issue. This step involved evaluating what procedures have succeeded recently and comparing the onset and spread of the crisis. Treatment programs from both the past and present have been analyzed and evaluated to measure their success and identify areas of improvement, and suggestions regarding further research are presented.

The current situation regarding the illicit fentanyl crisis has been presented by analyzing past and present data, presenting how individual sectors of the community are affected and services are delayed. An investigative, descriptive approach was employed to illustrate how the drug has infiltrated society and created a burden that affects all citizens, from both a financial and public safety perspective. Information from the Vancouver Police Department and the DEA was particularly useful as it mapped the growth of the issue in

¹⁹ Drug Enforcement Administration.

Canada and compared the similarities and differences among U.S. cities embroiled in the crisis.²⁰

The effects of illicit fentanyl and its analogs were examined using data collected by the CDC and DEA. This material was integrated into the thesis by comparing the CDC and DEA's information to scholarly journals and peer-reviewed articles. Information was analyzed comparing the national crisis to the local level. Comparative data showed that illicit fentanyl has affected public safety organizations and communities similarly wherever it has been introduced. Effects that include public safety policy changes and cost increases have been shown nationwide albeit to a greater degree in some areas of the country.²¹

²⁰ Margot Kuo, *The BC Public Health Opioid Overdose Emergency: March 2017 Update* (Vancouver: British Columbia Centre for Disease Control, 2017), 22.

²¹ Drug Enforcement Administration, *2018 National Drug Threat Assessment*.

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II. LITERATURE REVIEW

This review of literature consists of peer-reviewed professional journals, government agency reports, previous theses on similar topics, government web pages, and current newspaper articles. This literature has been used to describe the fentanyl crisis in North America and its evolution.

Professional journals and government agency reports have been utilized to map the issue of illicit fentanyl use from when it was first recognized until the present day. Information provided from these reports was the primary resource for statistical data and trends. Reports of this type were particularly useful. However, the subject of illicit fentanyl and its analogs is an extremely dynamic subject. Government reports and professional journals are often published on a timeline that makes some information provided obsolete or outdated. Therefore, other sources of literature were used to provide necessary current information.

Government web pages, along with newspaper and periodical articles, were used as sources for current data. Government web pages were useful and credible for statistical information and information regarding public safety, drug prevention programs, and comparative studies of the entrance of new illicit fentanyl analogs into the drug market. Newspapers and periodicals were of particular use in tracking daily events regarding overdoses and seizures involving illicit fentanyl. However, determining the reliability of the information required significant back-tracking and cross-referencing.

Information regarding the use of illicit fentanyl and its analogs and the link to overdoses and overdose deaths in North America is relatively simple to find. However, much of the information provided is redundant and cites outdated references and material. Researching the subject of illicit fentanyl and its analogs provides an abundance of sidebar topics that could easily be distracting. It is well known there is an opioid problem in North America. The literature reveals that heroin, illicit fentanyl, and opioids often get grouped into one category. Although the review reveals they are linked, the grouping of the drugs

together requires that the data be scrutinized for their overall significance to the research question.

Illicit fentanyl overdoses are an epidemic in the United States. Cities across America are seeing increases in fentanyl overdoses. In Indianapolis alone, 50 percent of all overdoses in 2017 were linked to fentanyl.²² According to the CDC, in 2013, the ratio of synthetic opioid overdose rates in the country was one overdose for every 100,000 people. By 2016, that ratio had increased to 6.2 for every 100,000 people.²³ Fentanyl overdoses increased by 625 percent from 2013 to 2016. Studies nationally show overdoses involving fentanyl at 68 percent in 2017.²⁴ Based on this information, there is no reason to believe that the increase in overdose trends will decline without significant action.

Those who ingest fentanyl are not the only ones at risk; fentanyl exposure is a danger to first responders, too. Law enforcement, fire departments, and emergency medical services are finding themselves exposed to the illicit substance often enough that the DEA has issued a guide for first responders describing the dangers and how to react to them.²⁵ Illicit fentanyl poses a unique hazard to first responders. Unlike drugs such as marijuana, heroin, or pills, fentanyl can be absorbed into the body in a small dose through the skin or inhaled and be deadly. The Department of Homeland Security has reported that the ingestion of fentanyl, specifically through inhalation, presents the greatest threat to first responders.²⁶ First responders are exposed to illicit fentanyl on a daily basis while responding to emergencies and might not even be aware of its presence as it may be

²² Peter Phalen et al., “Fentanyl Related Overdose in Indianapolis: Estimating Trends Using Multilevel Bayesian Models,” *Addictive Behaviors* 86 (November 2018): 4–10, <https://doi.org/10.1016/j.addbeh.2018.03.010>.

²³ Johnathan H. Duff and Lisa N. Sacco, “Increase in Illicit Fentanyl Overdose Deaths” (Washington, DC: Congressional Research Service, 2018), <https://www.hsdl.org/?abstract&did=812056>.

²⁴ Cody Colon-Berezin et al., “Overdose Deaths Involving Fentanyl and Fentanyl Analogs—New York City, 2000–2017,” *Morbidity and Mortality Weekly Report* 68, no. 2 (2019): 37–40.

²⁵ Drug Enforcement Administration, *Fentanyl*.

²⁶ Department of Homeland Security, “Protecting First Responders on the Frontlines of the Fentanyl Epidemic,” in *Proceedings of the 2017 Fentanyl Working Meeting* (Washington, DC: Department of Homeland Security, 2018), <https://www.hsdl.org/?abstract&did=813975>.

disguised as another medication.²⁷ Emergency calls involving fentanyl do not always get dispatched as overdoses and rarely mention fentanyl specifically. Firefighters and paramedics treat overdoses involving illicit fentanyl in private homes, vehicles, and halfway houses. Confined spaces such as these present an environment where the threat to exposure is high, even if wearing proper safety gear.²⁸

Emergency responders have reported symptoms of fentanyl exposure such as dizziness, confusion, and weakness after responding to fentanyl overdose calls.²⁹ Dan Kallen, a detective in southern New Jersey, was searching a home with fellow officers in August 2015 when they found a bag of white powder. Kallen removed a scoop of powder for testing. When he was done, he closed the bag, and a bit of air escaped, carrying a puff of powder with it. It was enough to send Kallen and a fellow officer to the emergency room.³⁰ Again, in September 2016, 11 Connecticut police officers went to the hospital after suffering from airborne exposure to fentanyl. In a search warrant that netted 50,000 bags of heroin, the SWAT team used flash grenades when gaining entry, which may have aerosolized the powder. The resulting symptoms included lightheadedness, nausea, sore throats, headaches, and vomiting. All the officers were treated and released.³¹ Six firefighters in Delaware were exposed to fentanyl and had to be transported to the hospital, according to *USA Today*.³² In Winnipeg, Canada, paramedics on scene of a nine-month-

²⁷ Drug Enforcement Administration, “Counterfeit Prescription Pills Containing Fentanyls.”

²⁸ John Howard and Jennifer Hornsby-Myers, “Fentanyls and the Safety of First Responders: Science and Recommendations,” *NIOSH Science Blog*, June 26, 2018, <https://blogs.cdc.gov/niosh-science-blog/2018/06/26/fentanyls-and-first-responders/>.

²⁹ “DEA Warning to Police and Public: Fentanyl Exposure Kills,” Drug Enforcement Administration, June 10, 2016, <https://www.dea.gov/press-releases/2016/06/10/dea-warning-police-and-public-fentanyl-exposure-kills>.

³⁰ Jim Salter, “New Worries for First Responders: Fentanyl Exposure,” *Morning Call*, June 26, 2016, <https://www.mcall.com/news/nation-world/mc-fentanyl-police-worries-20160626-story.html>.

³¹ Burke, “The Dangers of Synthetic Opioids.”

³² Josephine Peterson and Adam Duvernay, “Seven Wilmington First Responders Receive Accidental Dose of Fentanyl through Misplaced Fan,” Delaware Online, September 7, 2018, <https://www.delawareonline.com/story/news/crime/2018/09/07/seven-first-responders-treated-fentanyl-exposure/1222531002/>.

old who was not breathing were overcome by fentanyl and had to be treated with Narcan on scene before being transported to the hospital. The *Pittsburg Post-Gazette* reported that 18 police officers in Pittsburg had to be taken to the hospital after being exposed to fentanyl during a drug raid in 2017.³³ Police dogs have also been exposed and gotten sick from the drug.³⁴ In May 2018, three police dogs in Broward County, Florida, were exposed to fentanyl while assisting on a federal drug raid and became ill.³⁵

Currently, the numbers of confirmed exposures are mixed due to misreporting by the media and the lack of follow-up testing of first responders after exposure.³⁶ The risk of exposure has resulted in law enforcement agencies carrying the drug naloxone (brand name Narcan) to treat fellow officers in the event of exposure.³⁷ A 2017 report regarding fentanyl exposure to police indicated that law enforcement in three states had reported 20 encounters with fentanyl for every 1,000 residents.³⁸ While the fire service and law enforcement have responded to the new dangers of fentanyl using the latest protection and prevention methods, the threat of fentanyl exposure is an issue that the nation as a whole will have to address using prevention and detection.³⁹ Without a doubt, first responders who are involved in some form of response to drug overdoses, clandestine drug labs, and even other occupancies where drugs are not routinely expected to be found are at a high

³³ Gary Evans, "Exposures to Opioid Patients Endanger Healthcare Workers," *Hospital Employee Health* 36, no. 10 (October 2017), ProQuest.

³⁴ Olga Khazan, "Protecting Police Dogs from Fentanyl," *Atlantic*, May 11, 2018, <https://www.theatlantic.com/health/archive/2018/05/protecting-police-dogs-from-fentanyl/560132/>.

³⁵ Khazan.

³⁶ Department of Homeland Security.

³⁷ InterAgency Board, "Recommendations on Selection and Use of Personal Protective Equipment and Decontamination Products for First Responders against Exposure Hazards to Synthetic Opioids, Including Fentanyl and Fentanyl Analogues" (Arlington, VA: InterAgency Board, August 2017), <https://www.interagencyboard.org/sites/default/files/publications/IAB%20First%20Responder%20PPE%20and%20Decontamination%20Recommendations%20for%20Fentanyl.pdf>.

³⁸ Sophia Chiu, Kendra Broadwater, and Jessica F. Li, *Evaluation of Potential Occupational Exposures to Opioids in a City Fire and Police Department* (Washington, DC: National Institute for Occupational Safety and Health, 2018), <https://www.hsd1.org/?abstract&did=815279>.

³⁹ Drug Enforcement Administration, *Fentanyl*.

risk of exposure. There are no placards or labels, no material data safety sheets, no occupancy or location expectations; the only tool to recognize fentanyl's presence is an awareness of the hazards and related illicit drugs.⁴⁰

The threat of illicit fentanyl exposure to the first responder is compounded by the expanding use of the drug. Many methods and programs have been instituted to combat illicit fentanyl use. Many of these programs target different segments of society. However, experts disagree as to the effectiveness of current school-based prevention programs used to curb alcohol and drug abuse before students are exposed.⁴¹ One nationally recognized program is D.A.R.E., which began in 1983 in Los Angeles and has targeted students from kindergarten to the 12th grade. To date, D.A.R.E. has become the largest school-based drug program in the United States, having being implemented in 75 percent of schools.⁴² The goal of the program is to reduce drug use among elementary and junior high students by educating them and encouraging them to make healthy decisions and resist peer pressure.⁴³ Evaluations of D.A.R.E. have produced inconsistent findings regarding the program's effectiveness.⁴⁴ Harvard Graduate School conducted a study of 16 school districts that used D.A.R.E. and found that the primary motivation of incorporating the program was the resulting positive relationships between police officers and students, not its effectiveness in deterring alcohol and drug abuse.⁴⁵ A 2015 systematic review of D.A.R.E. by Caputi and McLellan, published in the journal *Drugs, Education, Prevention, and Policy*, analyzed

⁴⁰ Burke, "The Dangers of Synthetic Opioids."

⁴¹ Matthew J. Zagumny and Michael K. Thompson, "Does D.A.R.E. Work?: An Evaluation in Rural Tennessee," *Journal of Alcohol and Drug Education* 42, no. 2 (Winter 1997): 32–41.

⁴² Theodore L. Caputi and A. Thomas McLellan, "Truth and D.A.R.E.: Is D.A.R.E.'s New Keepin' It Real Curriculum Suitable for American Nationwide Implementation?," *Drugs: Education, Prevention and Policy* 24, no. 1 (2017): 49–57, <https://doi.org/10.1080/09687637.2016.1208731>.

⁴³ Wei Pan and Haiyan Bai, "A Multivariate Approach to a Meta-Analytic Review of the Effectiveness of the D.A.R.E. Program," *International Journal of Environmental Research and Public Health* 6, no. 1 (January 2009): 267–77, ProQuest.

⁴⁴ Pan and Bai.

⁴⁵ Sarah Birkeland, Erin Murphy-Graham, and Carol Weiss, "Good Reasons for Ignoring Good Evaluation: The Case of the Drug Abuse Resistance Education (D.A.R.E.) Program," *Evaluation and Program Planning* 28, no. 3 (August 2005): 247–56, <https://doi.org/10.1016/j.evalprogplan.2005.04.001>.

677 abstracts pertaining to the program’s effectiveness. Of those studies, 11 met the inclusion criteria of “testing effectiveness” on drug abuse.⁴⁶ The review yielded mixed results regarding the effectiveness and appropriateness of D.A.R.E. and its new Keepin’ It Real program. The primary recommendations were to develop a standardized evaluation system for all substance abuse and prevention programs.⁴⁷ Moreover, as D.A.R.E. is the most prevalent drug prevention program in the United States, it is imperative that a measure be put in place to validate D.A.R.E. by collecting and presenting scientific evidence of the program’s effectiveness. The evidence collected should include the D.A.R.E. program’s effectiveness in preventing or limiting all types of drugs. Presumably, this approach would present the ability to steer the program in a direction to strengthen itself in problematic areas. Presently, D.A.R.E. markets itself as an “evidence-based” program.⁴⁸ In actuality, the evidence reviewed to present the claim is only based on evidence of D.A.R.E.’s middle school effectiveness. Evaluations of other grades produced “insignificant or even counterproductive results.”⁴⁹

Programs such as D.A.R.E. need to be rewritten and new programs put in place to educate those who may become subject to using fentanyl either deliberately or accidentally. For instance, the D.A.R.E. program’s official website makes no mention of fentanyl and only briefly mentions opioids, even though opioids and synthetic opioids such as fentanyl accounted for more than 28,000 deaths in 2017—more deaths than from any other drug.⁵⁰ Presumably, once a significant evaluation of D.A.R.E. is completed, data would be generated to create educational methods that target specific groups at high risk for exposure and addiction. As illicit fentanyl becomes more prevalent, education regarding fentanyl is

⁴⁶ Caputi and McLellan, “Truth and D.A.R.E.,” 50.

⁴⁷ Caputi and McLellan.

⁴⁸ Caputi and McLellan, 56.

⁴⁹ Caputi and McLellan, 54.

⁵⁰ “Synthetic Opioid Overdose Data,” Centers for Disease Control and Prevention, April 2, 2019, <https://www.cdc.gov/drugoverdose/data/fentanyl.html>.

especially crucial. In 2018, 19.4 percent of persons 12 or older had tried marijuana.⁵¹ Furthermore, the National Institute on Drug Abuse reports that 71 percent of all high school seniors report that they do not consider marijuana smoking harmful. This finding further suggests that the D.A.R.E. program, or any other school-based drug education program, should stress in its curriculum the possibility of drugs being laced or disguised as different medicines. Potential drug users must be exposed to the reality that what they are purchasing and ingesting may not be what they expect.⁵²

As recently as August 2019, fentanyl-laced marijuana has been found in New York State, Chicago, Vancouver, and overseas.⁵³ Marijuana is not usually associated with fentanyl use.⁵⁴ Consequently, persons thinking they are using marijuana, a drug they may find acceptable, could be exposing themselves to illicit fentanyl. Fentanyl users develop a tolerance over time and with repeated use, which results in the need to ingest more fentanyl to achieve desired effects. Fentanyl-laced marijuana may have the desired effects for a fentanyl user, but someone unknowingly ingesting fentanyl in laced marijuana is very susceptible to overdose.⁵⁵ Fentanyl-laced marijuana has been reported in the United States, Canada, and Europe, thus creating a threat for anyone who uses the drug. These facts highlight that with new threats like illicit fentanyl, there should be a reevaluation of the methodology and effectiveness of drug-use prevention programs. To this end, a thorough evaluation may lead to a makeover of D.A.R.E. and other school-based drug programs or

⁵¹ Douglas A. McVay, ed., “Drug Use Prevalence and Trends,” in *Drug War Facts* (Lancaster, PA: Common Sense for Drug Policy, 2019), <https://drugwarfacts.org/chapter/prevalence>.

⁵² “Results from the 2016 National Survey on Drug Use and Health: Detailed Tables,” Substance Abuse and Mental Health Services Administration, accessed July 28, 2019, <https://www.samhsa.gov/data/sites/default/files/NSDUH-DetTabs-2016/NSDUH-DetTabs-2016.htm#tab1-1B>.

⁵³ Taylor Hartman, “Officials Warn Public after Deadly Fentanyl-Laced Marijuana Found, Suspect Arrested,” Fox 13 (Salt Lake City), April 13, 2019, <https://fox13now.com/2019/04/13/police-warn-public-after-deadly-fentanyl-laced-marijuana-found-in-new-york-county/>.

⁵⁴ Jeffrey DeSimone, “Is Marijuana a Gateway Drug?,” *Eastern Economic Journal* 24, no. 2 (Spring 1998): 149–64.

⁵⁵ John Colebourn, “Fentanyl-Laced Marijuana Causing Overdoses, Deaths,” *Prince George Citizen*, March 4, 2015, <https://www.pressreader.com/canada/the-prince-george-citizen/20150304/28154369386367>.

perhaps the creation of new curricula that will be measurable and target specific populations, thereby making a difference.

The White House introduced the Crisis Next Door website in 2017 to address the current problem, but its effectiveness has yet to be determined.⁵⁶ Crisis Next Door shares stories of recovering addicts beating their addiction but does not go into the details of drugs that are laced with fentanyl. Peer-to-peer education is a new method that shows promise in treating addiction and teaching users safer methods for identifying and using drugs such as fentanyl. The idea of this program is that users will give information to others within their social network (e.g., information about what drugs may be laced with fentanyl), and the message will change practices and behaviors within the community. Research has shown that if users receive tools such as test strips to detect fentanyl in their purchased product, they are less likely to ingest the drug.⁵⁷ In fact, a 2018 study by Johns Hopkins Bloomberg School for Public Health showed that not only are people who use drugs concerned about fentanyl in their supply, but the majority of them would modify their use behavior if their drug tested positive.⁵⁸ A 2018 study by Krieger et al. recruited drug users in Rhode Island and trained them to use rapid fentanyl test strips that would detect fentanyl contamination in drugs or urine. During that study, it was revealed that over 90 percent of users ages 18–35 stated they would use the test strips to check for fentanyl-laced medications, and 99 percent stated that it would be simple to use the test strips.⁵⁹ Seventy one percent of all participants in the study answered “yes” when asked if their friends would be interested in using the fentanyl test strips.⁶⁰ Consequently, these data suggest that test strips are a satisfactory harm-reduction strategy. For this purpose, Brown University just received two

⁵⁶ White House, “Fighting the Crisis Next Door,” press release (Washington, DC: White House, March 20, 2018), ProQuest.

⁵⁷ Maxwell S. Krieger et al., “High Willingness to Use Rapid Fentanyl Test Strips among Young Adults Who Use Drugs,” *Harm Reduction Journal* 15, no. 7 (2018): 1–9.

⁵⁸ Susan G. Sherman et al., *Fentanyl Overdose Reduction Checking Analysis Study* (Baltimore: Johns Hopkins Bloomberg School of Public Health, 2018), https://americanhealth.jhu.edu/sites/default/files/inline-files/Fentanyl_Executive_Summary_032018.pdf.

⁵⁹ Krieger et al., “High Willingness to Use Rapid Fentanyl Test Strips,” 1, 5.

⁶⁰ Krieger et al.

five-year grants totaling \$6.8 million to expand and test the fentanyl test strip program in the hopes of collecting information and decreasing overdose rates by 40 percent.⁶¹ The test strips show promise for first responders in checking any remaining drugs on overdose scenes for the presence of fentanyl. This detection could prevent first responders from being exposed as well as assist in patient care by positively identifying what chemical caused the medical issue.

Illicit fentanyl overdoses are an epidemic in the United States. A combination of policy change, education, prevention, and proactive intervention is the smartest practice to overcome the nation's fentanyl and overdose crisis. An examination of the aforementioned methods and analysis of how they could be put into practice in the United States might be a step in the right direction. Europe and Canada have already implemented policies that have shown some success. This thesis examines the current and previous policies for better ways to combat this epidemic.

⁶¹ Kerry Benson, "In Confronting Opioid Crisis, Researchers to Test Neighborhood-Based Interventions, Fentanyl Test Strips," Brown University, October 29, 2019, <https://www.brown.edu/news/2019-10-29/opioid-intervention>.

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III. FENTANYL IN THE UNITED STATES: AN INTRODUCTION

Illicit fentanyl is presently the most prevalent synthetic opioid threatening the United States, and there is no indication that the threat will lessen in the near future. In 2016, drug overdoses involving synthetic opioids such as fentanyl killed approximately 19,143 Americans, which is a 110 percent rise over the previous year, according to the DEA. This overdose death rate eclipses totals from vehicle crashes, firearm deaths, and deaths attributed to the human immunodeficiency virus.⁶² The CDC has reported that from 2015 to 2016, there was a 21.4 percent increase in drug overdose deaths, and two-thirds of these deaths involved an opioid.⁶³ The largest increase in these overdose deaths involved a synthetic opioid such as fentanyl (see Figure 1).⁶⁴ On the other hand, from 2016 to 2017, deaths caused by prescription opioids, legal fentanyl, and heroin remained stable. The rate of fentanyl overdoses in males per 100,000 increased from 6.1 percent in 1999 to 29.1 percent in 2017. Female overdoses increased from 3.9 percent in 1999 to 14.4 percent in 2017.⁶⁵ This increase in overdose deaths involved all age groups, from 15 to 65 and over. Because of this, it can be inferred that illicit fentanyl is becoming more prevalent and available for purchase and use. The drastic increases in overdoses, coupled with the presence of illicit fentanyl in most cases, reaffirm there is an illicit fentanyl crisis that is worsening. Combating this growing crisis requires an understanding of the origin of the drug and the differences between fentanyl, illicit fentanyl, and opioids.

⁶² Celina B. Realuyo, “The New Opium War: A National Emergency,” *Prism: Journal of the Center for Complex Operations* 8, no. 1 (March 2019): 132–42.

⁶³ Lawrence Scholl et al., “Drug and Opioid-Involved Overdose Deaths—United States, 2013–2017,” *Morbidity and Mortality Weekly Report* 67 (2019): 1419–27, <https://doi.org/10.15585/mmwr.mm675152e1>.

⁶⁴ Scholl et al.

⁶⁵ Scholl et al.

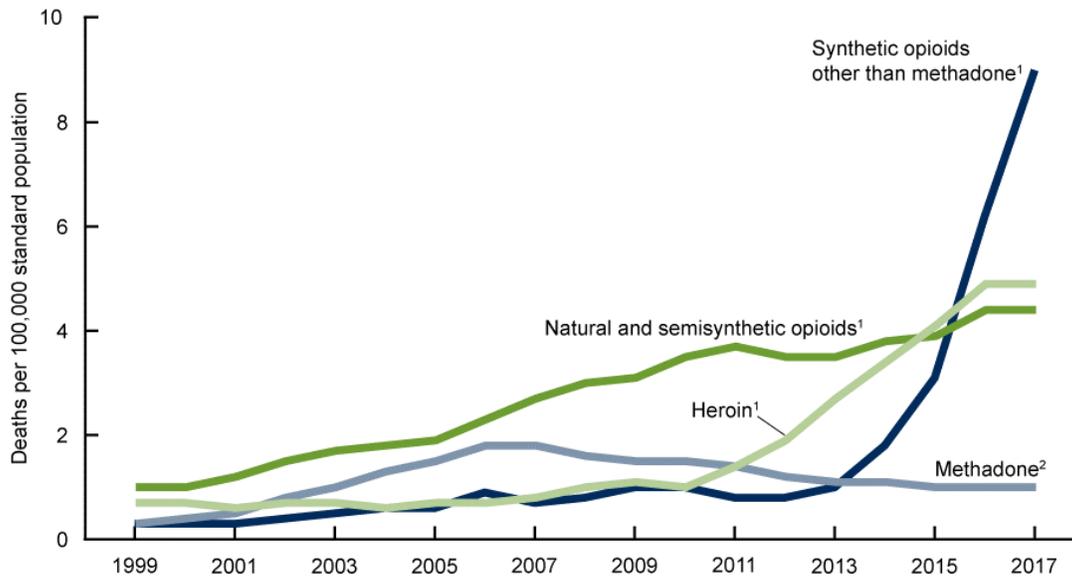


Figure 1. Age-Adjusted Drug Overdose Death Rates, by Opioid Category: United States, 1999–2017⁶⁶

A. THE BIRTH OF FENTANYL

Fentanyl was developed by Paul Janssen and patented in the United States on January 5, 1965, and was first used as an intravenous anesthetic in 1960 under the name Sublimaze. Legal fentanyl’s creation was useful as it possessed the narcotic effects of opiates such as morphine but lacked the negative side effects of standard opiates such as nausea and vomiting.

The term opioid, or opiates, refers to drugs such as morphine and codeine that occur naturally and come from the opioid poppy plant.⁶⁷ Fentanyl is a potent synthetic opioid that is used to treat severe pain after surgery or indicated for treatment of pain for certain types of cancer. To this day, legal fentanyl is still used during anesthesia.

⁶⁶ Source: Holly Hedegaard, Arialdi M. Miniño, and Margaret Warner, “Drug Overdose Deaths in the United States, 1999–2017,” Centers for Disease Control and Prevention, November 2018, <https://www.cdc.gov/nchs/products/databriefs/db329.htm>.

⁶⁷ R. B. Raffa et al., “The Fentanyl Family: A Distinguished Medical History Tainted by Abuse,” *Journal of Clinical Pharmacy and Therapeutics* 43, no. 1 (2018): 154–58, <https://doi.org/10.1111/jcpt.12640>.

Since the creation of fentanyl, the drug has also been synthesized for use in veterinary medicine under names such as carfentanyl (which under DEA regulation is 100 times stronger than fentanyl and 10,000 times more potent than morphine), acetyfentanyl, acryfentanyl, and fluorofentanyl among others.⁶⁸ Fentanyl can be divided into two groups: (1) pharmaceutical fentanyl, which is used to treat pain, and (2) illicit, non-pharmaceutical fentanyl, which is created illegally and used recreationally. Both groups of fentanyl have the same desired effect, which is pain relief. The effects of all fentanyls are like heroin and morphine, both of which are derived naturally from the poppy plant, but fentanyls are much stronger.⁶⁹ Figure 2, courtesy of the New Hampshire State Police Forensic Laboratory, compares equivalent doses of two types of fentanyl and heroin.



Figure 2. Equal Doses of Heroin and Two Vials of Fentanyl⁷⁰

Fentanyl can be administered via injection, inhalation, absorption, insufflation (blowing into a cavity), or volatilization (vaporizing) or rectally. Symptoms of fentanyl use

⁶⁸ Raffa et al., “The Fentanyl Family.”

⁶⁹ Theodore H. Stanley, “The Fentanyl Story,” *Journal of Pain* 15, no. 12 (2014): 1215–26, <https://doi.org/10.1016/j.jpain.2014.08.010>.

⁷⁰ Source: Clare Roth, “County Coroner Says Overdose Deaths Are Spiking, with Fentanyl to Blame,” WOSU Radio, June 20, 2017, <https://radio.wosu.org/post/county-coroner-says-overdose-deaths-are-spiking-fentanyl-blame#stream/0>.

include lethargy, respiratory depression, difficulty concentrating, coma, and cardiac arrest. However, fentanyl is potentially lethal in doses as low as .25 mg.⁷¹ Other symptoms may occur depending on the drug in which fentanyl is consumed or mixed with.⁷²

B. ILLICIT FENTANYL

The drug fueling the current opioid crisis is *illicit* fentanyl. For this thesis, the term illicit fentanyl refers to all illegally produced synthetic opioids and opioid analogs. An analog of fentanyl is defined as a compound with a molecular structure like fentanyl (a current list appears below). Legal fentanyl, which is approved and controlled by the Food and Drug Administration (FDA), is a synthetic opioid that is estimated to be 50 times stronger than morphine and 30–50 times stronger than heroin.⁷³ In contrast, illicit fentanyl's potency varies as it is produced in clandestine laboratories both in the United States and abroad and is not manufactured following standard guidelines established by the FDA.⁷⁴ According to Katselou et al., the following narcotics fall under the category of fentanyl analogs:

1. fentanyl
2. sufentanil
3. alfentanil
4. remifentanil
5. acetylfentanyl
6. acryloylfentanyl
7. carfentanil
8. α -methyolfentanyl
9. 3-methyolfentanyl

⁷¹ “DEA Issues Nationwide Alert on Fentanyl as Threat to Health and Public Safety,” Drug Enforcement Administration, March 18, 2015, <https://www.dea.gov/press-releases/2015/03/18/dea-issues-nationwide-alert-fentanyl-threat-health-and-public-safety>.

⁷² Katarzyna Kuczyńska et al., “Abuse of Fentanyl: An Emerging Problem to Face,” *Forensic Science International* 289 (August 2018): 207–14, <https://doi.org/10.1016/j.forsciint.2018.05.042>.

⁷³ Drug Enforcement Administration, *Fentanyl*.

⁷⁴ Daniel Carpenter, “Strengthen and Stabilize the FDA,” *Nature* 485, no. 7397 (2012): 169–70, <http://dx.doi.org/10.1038/485169a>.

10. Furanylfentanyl
11. 4-fluorobutyrylfentanyl
12. 4-methoxybutyrylfentanyl
13. 4-chloroisobutyrylfentanyl
14. 4-fluoroisobutyrylfentanyl
15. Tetrahydrofuranylfentanyl
16. Valerylfentanyl
17. Cyclopentylfentanyl
18. Ocfentanil
19. MT-45 (1-cyclohexyl-4-(1,2-diphenylethyl)piperazine)
20. AH-7921 (3,4-dichloro-*N*-{[1(dimethylamino)cyclohexyl]methyl} benzamide)
21. U-47700 (3,4-dichloro-*N*-[(1R,2R)-2-(dimethylamino cyclohexyl)]-methylbenzamide)⁷⁵

C. OPIOID CRISIS: A HISTORY

The birth of the prescription opioid crisis that eventually led to the current illicit fentanyl crisis began in 1996 with the introduction of OxyContin by Purdue Pharma. The release coincided with the medical field's effort to address the issue of undertreated pain. OxyContin is used for the management of chronic pain due to injury or cancer. It is listed as a Schedule 2 drug, defined by the DEA as a "substance or chemical with a high potential for abuse, with use potentially leading to severe psychological or physical dependence."⁷⁶ OxyContin is designed as a long-acting medication that provides 12 hours of pain relief when the pill is taken intact. Soon after its release, users discovered that if the OxyContin pill was crushed and then snorted, injected, or chewed, the 12-hour dose would be delivered immediately and result would be a maximum exhilarating effect. News of how to misuse the medication spread across the internet and other media sources, and within the next six months, mortality rates from overdose increased.⁷⁷ Ingesting OxyContin in any manner

⁷⁵ Maria Katselou et al., "AH-7921: The List of New Psychoactive Opioids Is Expanded," *Forensic Toxicology* 33, no. 2 (2015): 195–201, <https://doi.org/10.1007/s11419-015-0271-z>; Paolo Frisoni et al., "Novel Synthetic Opioids: The Pathologist's Point of View," *Brain Sciences* 8, no. 9 (September 2018), <http://dx.doi.org/10.3390/brainsci8090170>.

⁷⁶ "Drug Scheduling," Drug Enforcement Administration, accessed March 10, 2020, <https://www.dea.gov/drug-scheduling>.

⁷⁷ Nabarun Dasgupta, Kenneth D. Mandl, and John S. Brownstein, "Breaking the News or Fueling the Epidemic?: Temporal Association between News Media Report Volume and Opioid-Related Mortality," *PLoS One* 4, no. 11 (November 2009), <http://dx.doi.org/10.1371/journal.pone.0007758>.

other than prescribed results in a high risk for overdose and addiction as the drug is introduced into the body at high concentrations.⁷⁸ Emergency department incidents involving the abuse and misuse of prescription opioids increased 153 percent between 2004 and 2011 as did admissions to substance abuse programs.⁷⁹ Presumably, the ingestion of higher concentrations of OxyContin led to an even greater demand for the drug, leading to higher numbers of abuse and addiction.

As time progressed, medical professionals began to write more OxyContin prescriptions. This increase in prescriptions was primarily due to a large-scale marketing campaign by drug companies that capitalized on the American Pain Society's recommendation regarding the treatment of pain. The recommendation, accepted by the American Medical Association, had been to assess and treat pain accordingly and aggressively. Prior to this recommendation, there had been four primary vital signs addressed by medical professionals when dealing with patients: temperature, pulse, respiration, and blood pressure. The new recommendation added pain as the fifth vital sign and advocated for its immediate relief. It was no longer acceptable to have patients tolerate anything more than mild pain, and the new recommendation made it acceptable to treat all pain accordingly. It also led to the revision of treatment guidelines to include opioids for pain associated with cancer, which had previously been treated less aggressively.⁸⁰ Presumably, at the time the new guidelines were implemented, clinicians were unaware of the consequences that the new pain treatment guidelines would incur. A generation of new addicts, as well as the escalation of drug use from OxyContin to heroin and then to illicit fentanyl over a period of several years, was likely not a foreseen consequence.

⁷⁸ Abby Alpert, David Powell, and Rosalie Liccardo Pacula, "Supply-Side Drug Policy in the Presence of Substitutes: Evidence from the Introduction of Abuse-Deterrent Opioids," Working Paper 23031 (Cambridge, MA: National Bureau of Economic Research, January 2017), 8, <https://www.nber.org/papers/w23031.pdf>.

⁷⁹ Wilson M. Compton, Christopher M. Jones, and Grant T. Baldwin, "Relationship between Nonmedical Prescription-Opioid Use and Heroin Use," *New England Journal of Medicine* 374 (2016), <https://doi.org/10.1056/NEJMra1508490>.

⁸⁰ Donald M. Phillips, "JCAHO Pain Management Standards Are Unveiled," *Journal of the American Medical Association* 284, no. 4 (2000): 428–429.

During the 1990s, the shift to treating patients' pain caused the rise of pain clinics or "pill mills." Pill mill is a term used by some authorities to describe a doctor, medical facility, or pharmacy that dispenses large quantities of narcotics inappropriately. The increase in pill mills were accompanied by a rise in overdose death rates.⁸¹ New laws were put in place to limit the liberal distribution of narcotics, and in 2010, authorities began to arrest and prosecute illegal operators of pill mills. New regulations and enforcement began to limit access to legally prescribed opioids, which caused users to drive across state lines to find doctors and clinics that would write prescriptions. After the crackdown on these operations, many of the users were left without the ability to get the drugs they were previously acquiring legally, so they turned to the illegal market.⁸² Within this market, they have moved from opioid painkillers to more potent, less costly drugs, leading to a destructive competition to find the most affordable high.⁸³

Due to the exponential increase in drug-related overdoses and deaths, in 2010, OxyContin was no longer distributed to pharmacies in a pill form that could be crushed and manipulated to be ingested outside its recommended use. Consequently, in 2013, the FDA announced it would no longer approve any generic versions of the medication. OxyContin was then reformulated in a manner that made it "abuse proof": ingesting more pills than prescribed, mixing pills with alcohol, or taking the medication in conjunction with other pain medications would be the only means of overdose.⁸⁴ During the period when OxyContin was prevalent, overdose deaths quadrupled, making it the worst drug overdose epidemic in U.S. history—that is, until the introduction of illicit fentanyl into the American drug scene.

⁸¹ Alene Kennedy-Hendricks et al., "Opioid Overdose Deaths and Florida's Crackdown on Pill Mills," *American Journal of Public Health* 106, no. 2 (February 2016): 291–97, <http://dx.doi.org/10.2105/AJPH.2015.302953>.

⁸² German Lopez, "How Fentanyl Became America's Leading Cause of Overdose Deaths," Vox, December 21, 2017, www.vox.com/science-and-health/2017/5/8/15454832/fentanyl-carfentanyl-opioid-epedemic.

⁸³ Lopez.

⁸⁴ Theodore J. Cicero, "Abuse-Deterrent Formulations and the Prescription Opioid Abuse Epidemic in the United States: Lessons Learned from OxyContin," *JAMA Psychiatry* 72, no. 5 (2015): 424–30.

D. THREE WAVES OF ABUSE

The CDC believes three waves of abuse led to these epidemics for the United States and parts of Canada. The first wave of the epidemic began in the 1990s. Prescription medications, such as OxyContin and other opioids, were introduced into the drug market and made readily available as well as medically acceptable. Once the marketplace was saturated and users developed a dependence, they built up a tolerance to the drugs, which created the need for more drugs to be infused into the prescription opioid market. Once the DEA realized this increase in prescriptions, and overdoses and deaths due to opioid overdose increased, aggressive restrictions were placed on the legal distribution of prescription pain medications. This crackdown left drug users with no substitute to feed their addiction.

The substantial decrease in accessibility to prescription opioids left persons addicted to the OxyContin pills with no legal substitute for their pain medication, compelling them to seek an alternative to prevent painful withdrawals.⁸⁵ As was realized after the crackdown on pill mills, cheaper and more affordable drugs such as heroin and other synthetic opioids were used as substitutes, and overdose deaths began to rise substantially.⁸⁶ The CDC's Division of Vital Statistics reported a 145 percent increase in heroin use, and mortality due to heroin overdoses quintupled by 2014, which coincided with the closing of the pill mills. Frequent prescription opioid users have a 40-fold risk of dependence and abuse of heroin, according to the National Institute on Drug Abuse.⁸⁷ The need for stronger drugs grows as the human body slowly builds up a tolerance to heroin, thus creating a need for higher doses. This phenomenon makes heroin use less affordable and potentially leads the user to find a cheaper high.

⁸⁵ Lisa N. Sacco and Erin Bagalman, *Opioid Epidemic and Federal Efforts to Address It: Frequently Asked Questions*, CRS Report No. R44987 (Washington, DC: Congressional Research Service, October 18, 2017), <https://www.hsdl.org/?view&did=805271>.

⁸⁶ Sacco and Bagalman.

⁸⁷ National Institute on Drug Abuse, *Prescription Opioids and Heroin* (North Bethesda, MD: National Institute on Drug Abuse, January 2018), <https://www.hsdl.org/?view&did=818458>.

The final wave of the crisis was the introduction of illicit fentanyl, as it possessed both a high potency and low price. Heroin users also might unwillingly purchase fentanyl, thinking they are buying heroin. That is, the illicit drug manufacturers are mixing fentanyl with heroin to make the drug more potent at a lower cost. The consumer is likely unaware of the addition of illicit fentanyl. The use of fentanyl, as with heroin, causes one to develop a tolerance, require an increased dose, and desire to seek out fentanyl in the future.⁸⁸ The three waves of the opioid crisis are illustrated in Figure 3.⁸⁹

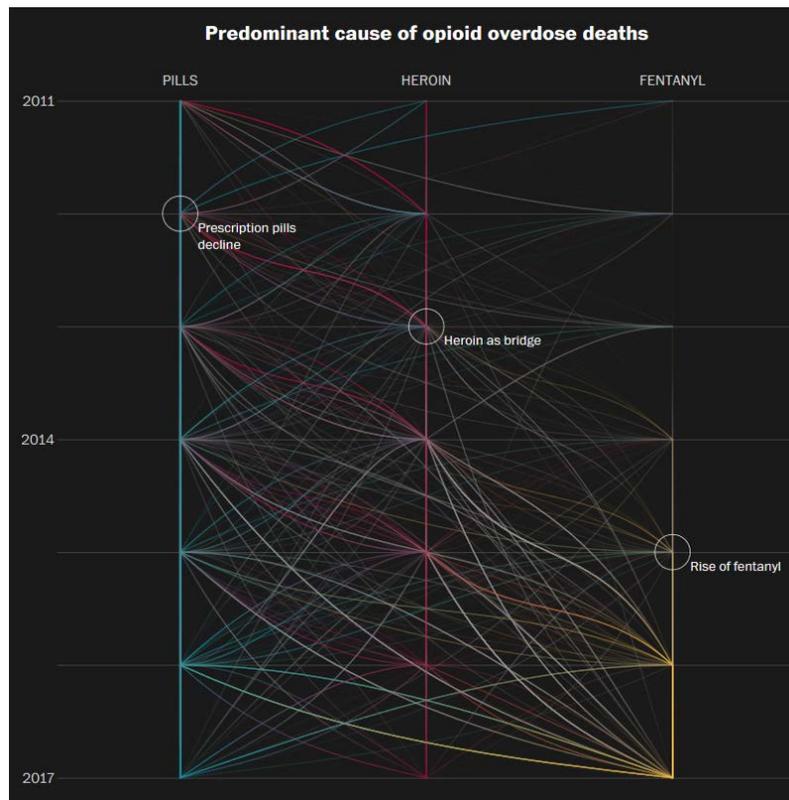


Figure 3. Predominant Cause of Opioid Overdose Deaths⁹⁰

⁸⁸ Drug Enforcement Administration, "Fentanyl Remains the Most Significant Synthetic Opioid Threat."

⁸⁹ Steven Rich et al., "How the Opioid Epidemic Evolved," *Washington Post*, December 23, 2019, <https://www.washingtonpost.com/graphics/2019/investigations/opioid-pills-overdose-analysis/>.

⁹⁰ Source: Rich et al.

The data illustrate how the first wave of the crisis began as prescription opioid pills became less available to users. Those users already addicted sought out another drug to feed their addiction, thus leading to the second wave, a rise in heroin use in 2013. The third wave of the crisis, illicit fentanyl use, reached epidemic levels around 2014 as heroin users sought a cheaper drug to satisfy their escalating addiction to opioids.

IV. PRESENT SITUATION

Fifteen years ago, it would have been difficult to predict that North America would become so heavily influenced by illicit fentanyl from overseas that its presence would affect the average person's life expectancy on the continent.⁹¹ The illicit fentanyl problem now occurring has created an environment in which policymakers and communities are trying to understand and respond to the situation. Policymakers are grappling to find acceptable solutions that are financially viable and socially acceptable. Communities are attempting to remedy the crisis but are financially overburdened. The call volume for first responders is growing, and hospital emergency rooms are experiencing the same problems. Crowding in emergency rooms due to the influx of overdose patients has increased, causing response delays for all types of out-of-hospital emergencies.⁹² The public has little understanding of the overall crisis and differing views regarding possible solutions.

Traditional methods of policing drug epidemics may not be effective to stem this crisis. The side effects of the illicit fentanyl influx also include increased drug prices and drug shortages, specifically for the drug naloxone, or Narcan.⁹³ Almost daily, there are news reports of seizures of illicit fentanyl by Border Patrol, the U.S. Coast Guard, and local police, but often, the smaller seizures go unreported to the media. Perhaps, communities think that illicit fentanyl will not affect their daily lives. However, from prescription drug costs, to emergency response, to the prosecution of drug traffickers, fentanyl will eventually affect everyone.

⁹¹ Charlotte Probst and Jürgen Rehm, "Alcohol Use, Opioid Overdose and Socioeconomic Status in Canada: A Threat to Life Expectancy?," *Canadian Medical Association Journal* 190, no. 44 (2018): E1294–95, <https://doi.org/10.1503/cmaj.180806>.

⁹² Marc Eckstein and Linda S. Chan, "The Effect of Emergency Department Crowding on Paramedic Ambulance Availability," *Annals of Emergency Medicine* 43, no. 1 (2004): 100–105, [https://doi.org/10.1016/S0196-0644\(03\)00747-9](https://doi.org/10.1016/S0196-0644(03)00747-9).

⁹³ Harper, "Antidote for Opioid Overdoses Often Is Difficult to Obtain."

A. FENTANYL DISGUISED

Illicit fentanyl consists of fentanyl and fentanyl analogs, such as acetylfentanyl, furanylfentanyl, and carfentanyl. The analogs, which are similar in chemical structure to fentanyl, are not routinely detected because specialized toxicology testing is required. Recent surveillance has also identified other emerging synthetic opioids, such as U-47700.⁹⁴ It has been discovered in counterfeit pill, tablet, and capsule form and has increased significantly in volume within the illegal drug market.⁹⁵ Illicit fentanyl in all forms is commonly mixed with or used simultaneously with other illegal drugs, which is why overdoses and overdose deaths are frequently listed as being caused by polydrug use.⁹⁶ The DEA also reports that dealers often do not know what is in the counterfeit pills or heroin they are selling. This lack of knowledge of their merchandise means that not all persons purchasing drugs are aware that they are using illicit fentanyl. This misrepresentation to the consumer or user leads to unintended overdoses by users that thought they were buying an illegally sold legal medication when in fact they were ingesting illicit fentanyl.⁹⁷ There is no indication that the popularity of illegally purchased pills will decline in the near future, and therefore, the illicit fentanyl crisis will continue, crippling communities with the financial burden of taking care of addicts and dealing with overdoses and overdose deaths. The fight against illicit fentanyl is not a battle—it is a war. To win this war, illicit fentanyl use must be understood, a strategy developed, and countermeasures put into place, implemented, and measured for effectiveness.

A 2014 national survey on drug use estimated that there were over four million non-medical users of prescription pain pills in the United States. The only drug used more frequently than prescription pills was marijuana. The large market for prescription

⁹⁴ O'Donnell et al., "Deaths Involving Fentanyl."

⁹⁵ O'Donnell et al.

⁹⁶ Rob Hill, "Polydrug Opioid Abuse & Mechanisms of Tolerance to Opioid Respiratory Depression" (PhD diss., University of Bristol, 2019), https://research-information.bris.ac.uk/files/183276843/Final_Copy_2019_01_23_Hill_R_PhD.pdf.

⁹⁷ Allison Bond, "Why Fentanyl Is Deadlier Than Heroin, in a Single Photo," *Business Insider*, August 8, 2017, www.businessinsider.com/why-fentanyl-is-deadlier-than-heroin-in-a-single-photo-2017-8.

medications has increased the incentive for illicit drug manufacturers to fill the void created by the government's crackdown on legal prescription medications.⁹⁸ Therefore, illicit fentanyl in the powder form is often packaged or pressed into pills, capsules, and tablets that resemble prescription medications such as Xanax, Percocet, and hydrocodone. Illicit fentanyl has even been masked to look like non-pain prescription pills, such as aspirin, Tylenol, and Viagra to disguise the drug further. A quick Google search using the term "pill press" revealed 60,000,000 results ranging from the sale of the pill press to videos of how to properly manufacture pills to look like the genuine article. The DEA is supposed to be notified when pill presses are imported into the country. Nevertheless, overseas vendors evade this law by mislabeling equipment or sending it disassembled.⁹⁹

Once the pill presses are operational, illicit fentanyl is "cut" or mixed with other medications. The substances mixed with illicit fentanyl vary from household products to drugs such as trazadone and Valium. Illicit fentanyl is mixed with other substances to increase the volume and profit of the drug. This crude method of mixing illicit fentanyl, which is extremely potent in small doses, makes it impossible to determine the dose of fentanyl in each pill. Then "dies"—plates in the shape of legal pills that press the powder into pill form—are used in conjunction with the pill press to make the pills look like the real medications. For example, when a person wishes to buy Xanax without a prescription, he gets in contact with an illegal drug dealer through friends or other channels. Users buy the pills under the assumption that they are purchasing pharmaceutical-grade prescription Xanax illegally. Often, these pills may contain illicit fentanyl mixed with another substance or substances that, if mixed correctly, will have the same euphoric results as the desired medication, in this case Xanax. The counterfeit pills, tablets, and "Z-bars" are identical in color, shape, and texture to the actual legal medicine. Unfortunately, the illicit fentanyl mixed into these pills and re-sold is so potent in small doses that when cut with other medications to increase the volume and profit, it is often impossible to determine the dose.

⁹⁸ Drug Enforcement Administration, "Counterfeit Prescription Pills Containing Fentanyls."

⁹⁹ Drug Enforcement Administration, *2018 National Drug Threat Assessment*.

As shown in Figure 4, the mix of illicit fentanyl and inactive substances can vary greatly, potentially leading to overdose.

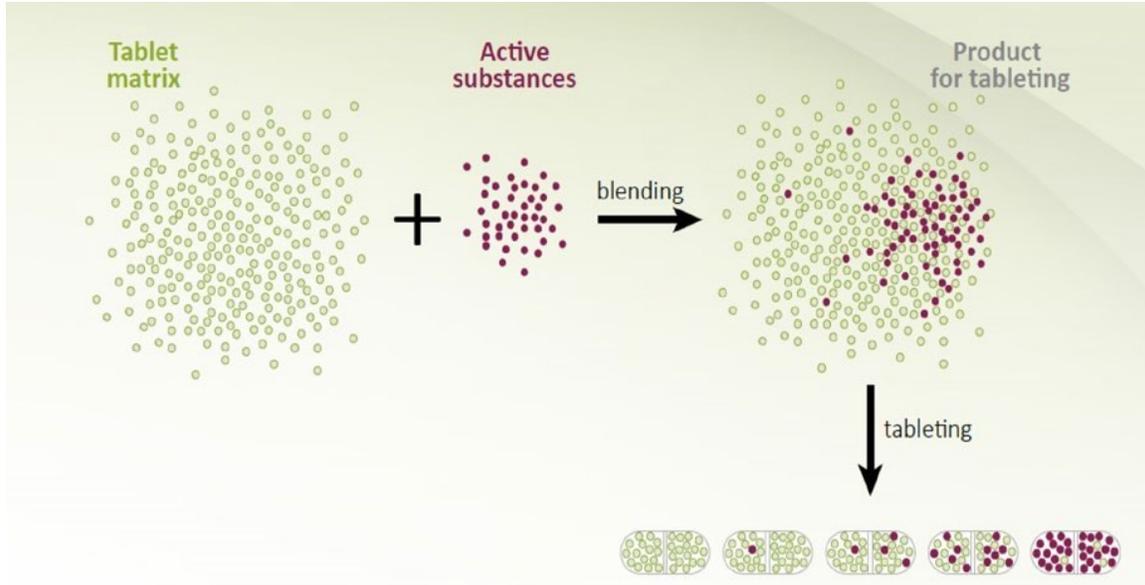


Figure 4. Variable Dose of Active Substance in Clandestinely Manufactured Pills¹⁰⁰

This illustration of the cutting process, courtesy of United Nations Office on Drugs and Crime, shows that mixing the tablet matrix with active substances easily results in unequal doses of the active drug in tablet form. This is the issue that presumably causes overdoses.¹⁰¹

The counterfeit pills often have uneven doses that, according to the Fentanyl Signature Profiling Program, can range from .03 to 1.9 mg per tablet of fentanyl in each pill. The lethal dose of fentanyl is 2 mg.¹⁰² This process of turning powdered fentanyl into “look alike” medications is common. This has been proven by the DEA’s seizure and analysis of 17 kg of illicit fentanyl in counterfeit pill form, a 7,266 percent increase from

¹⁰⁰ Source: Drug Enforcement Administration, *2018 National Drug Threat Assessment*, 32.

¹⁰¹ Drug Enforcement Administration.

¹⁰² Drug Enforcement Administration, “Counterfeit Prescription Pills Containing Fentanyl.”

2014.¹⁰³ This increase in the amount of illicit fentanyl, coupled with the public's lack of awareness about the drug's prevalence in the illegal drug marketplace, may be a contributing factor to the overdose rate currently being experienced. These counterfeit pills have been proven to have uneven doses of illicit fentanyl.¹⁰⁴ This is due to the difficulty in mixing small doses of this powerful drug evenly, a major factor in the profusion of overdoses nationwide. Figure 5, courtesy of the Drug Enforcement Administration, depicts a lethal dose of fentanyl next to a U.S. penny for comparison.



Figure 5. Two Milligrams of Fentanyl, a Potentially Lethal Dose¹⁰⁵

Another disturbing trend in placing illicit fentanyl in medications is fentanyl-laced marijuana. In April 2019, upstate New York had several overdoses related to fentanyl in marijuana. A marijuana seizure in a Wal-Mart parking lot yielded laced marijuana, and just three days later, three people were found overdosed in a car in Albany County after smoking a tainted marijuana cigarette.¹⁰⁶ In Vancouver, the Royal Canadian Mounted

¹⁰³ Drug Enforcement Administration, "Fentanyl Remains the Most Significant Synthetic Opioid Threat."

¹⁰⁴ Drug Enforcement Administration, "Counterfeit Prescription Pills Containing Fentanyls."

¹⁰⁵ Source: Mike Gallagher, "Fentanyl: A New Player in Deadly Drug Epidemic," *Albuquerque Journal*, February 15, 2017, <https://www.abqjournal.com/950170>.

¹⁰⁶ "Nip It in the Bud: Fentanyl Laced Marijuana a Fatal Threat," *Oracle*, May 2, 2019, <https://oracle.newpaltz.edu/nip-it-in-the-bud-fentanyl-laced-marijuana-a-fatal-threat/>.

Police have warned drug users that illicit fentanyl has been found in seized marijuana.¹⁰⁷ This is particularly dangerous as recreational marijuana users are not always narcotic users. Consequently, illicit fentanyl is being introduced to a new demographic that has not followed the traditional path of pain pills to heroin and then to illicit fentanyl. The introduction of fentanyl to people who have not used narcotics before means that they have no tolerance to the drug and can easily overdose.

B. ILLICIT FENTANYL USE ON THE RISE

Presently, illicit fentanyl use is on the rise. In the *2018 National Drug Threat Assessment*, the DEA claims that 11 of 21 of its field divisions had reported high fentanyl availability in the first six months of 2017.¹⁰⁸ However, among the remaining divisions, six reported more availability of fentanyl between 2016 and 2017, and four reported no change.¹⁰⁹ These statistics follows an increase in fentanyl use between 2015 and 2016 with some of the increase attributed to improved testing for fentanyl-related substances. Consequently, illicit fentanyl will continue to threaten the United States as its illegal import and availability, as well as the creation of new fentanyl-related substances, continue to grow.

The rapid proliferation of the illicit fentanyl problem has many moving parts, including supply, manufacturing, and demand. Illicit fentanyl is relatively inexpensive and, depending where it is manufactured, extremely potent as a drug. DEA drug seizures show that China supplies a more concentrated illicit fentanyl than Mexico.¹¹⁰ Unlike previous drug epidemics that were caused by an increasing demand, the illicit fentanyl market appears to be cultivated by the overwhelming supply. Additionally, fentanyl has been made popular as it produces uniquely high revenues for smaller criminal networks. Drugs such

¹⁰⁷ Flavio Nienow, "RCMP Warns Marijuana Users to Be Careful of Pot Laced with Fentanyl," *British Columbia Local News*, March 19, 2015, <https://www.bclocalnews.com/news/rcmp-warns-marijuana-users-to-be-careful-of-pot-laced-with-fentanyl/>.

¹⁰⁸ Drug Enforcement Administration, *2018 National Drug Threat Assessment*.

¹⁰⁹ Drug Enforcement Administration, 21–22.

¹¹⁰ Drug Enforcement Administration.

as marijuana or crystal meth are usually linked back to a cartel or drug lord. Illicit fentanyl creates larger profits because there is no need for sellers to have any allegiance to a cartel or trafficking organization, thus reducing associated costs.¹¹¹ Illicit fentanyl's low price and potency make it desirable to dealers as the profit margin is high, which perpetuates the demand from sellers.

C. CHINA AND ILLICIT FENTANYL

China has been the primary source for illicit fentanyl and fentanyl-like substances.¹¹² China's weak pharmaceutical regulatory system allows drug manufacturers to operate without oversight. The World Health Organization states the Chinese system of pharmaceutical production is closely linked to the country's commitment to providing universal health care for its people.¹¹³ The aging Chinese population of 1.4 billion people requires that pharmaceuticals be produced in an affordable way, which has burdened China's health care budget and fostered the environment for the U.S. crisis.

China's pharmaceutical industry was run by the government until 2001. At that time, China committed to the World Health Organization that state-owned pharmaceutical enterprises would be transformed into privately owned enterprises. This caused growth in the pharmaceutical industry in China without corresponding growth in the regulatory framework that kept production, quality, and scheduling under control.¹¹⁴ This lack of regulation has allowed new illicit fentanyl substances to be created and exported without any control from the Chinese government, which "schedules," or classifies, new drug chemicals one by one, making it nearly impossible to control the creation and export of drugs. Therefore, illicit fentanyl substances are exported before being assigned a drug

¹¹¹ Drug Enforcement Administration.

¹¹² Sean O'Connor, *Fentanyl Flows from China: An Update since 2017* (Washington, DC: U.S.-China Economic and Security Review Commission, 2018), <https://www.hsdl.org/?abstract&did=819035>.

¹¹³ World Health Organization, *China Policies to Promote Local Production of Pharmaceutical Products and Protect Public Health* (Geneva: World Health Organization, 2017), <https://www.who.int/phi/publications/2081China020517.pdf?ua=1>.

¹¹⁴ World Health Organization.

schedule. This atmosphere allows for the manufacturers of drugs to develop fentanyl and fentanyl-like substances faster than the government can regulate them, which keeps the epidemic one step ahead of regulation.

The U.S. government has been negotiating with China to battle the flow of illicit fentanyl. However, progress has been sluggish and fruitless. There has been some bilateral cooperation; nevertheless, the DEA has stated that more needs to be done to help the United States seize more drugs and identify individuals and organizations actively trafficking fentanyl.¹¹⁵ The DEA states that new psychoactive substances, such as fentanyl, estimated by the United Nations Office of Drug and Crime to be produced at a rate of one per week, are being produced faster than controls can be put in place to stop them.

D. ILLICIT FENTANYL TRAFFICKING

The United States has recognized the influx of illicit fentanyl across its borders as a serious issue. Therefore, legislation has been proposed and adopted to assist law enforcement regarding the trafficking of illicit fentanyl from China and other countries. Three proposed bills have tried to counter the fentanyl problem.

- The Synthetics Trafficking and Overdose Prevention Act of 2018 requires “advanced electronic information on international mail shipments.”¹¹⁶ These data assist law enforcement by identifying and declaring what is being sent in the mail. Furthermore, this act requires China to give advanced information on 70–100 percent of all mail shipped to the United States. Failure to comply will result in financial penalties and the possible restriction of a percentage of mail shipments from China. The legislation also provides incentives for countries to develop better screening programs for their shipped mail.

¹¹⁵ Drug Enforcement Administration, *2018 National Drug Threat Assessment*.

¹¹⁶ Synthetics Trafficking and Overdose Prevention Act, S. 3057, 115th Cong., 2d sess. (June 12, 2018), <https://www.congress.gov/bill/115th-congress/senate-bill/3057/text>.

- The Stop the Importation and Trafficking of Synthetic Analogues Act of 2017 allows for drugs to be immediately, temporarily scheduled so that drug enforcement agencies have time to investigate the potential dangers of substances.¹¹⁷ In addition, the bill added 13 synthetic fentanyl drugs to “Schedule A,” drugs yet to be classified by the U.S. government. These drugs have chemical properties with similar chemical properties to current scheduled drugs. Before this bill, illicit fentanyl-like substances could enter the country as they were not deemed illegal by classification.
- The Stopping Overdoses of Fentanyl Analogues Act allows for the scheduling of fentanyl and all fentanyl-like substances as Schedule 1 drugs, defined as “drugs with no currently accepted medical use.” This bill cuts off access to the ingredients that previously entered the country legally and were then mixed to make illicit fentanyl and fentanyl analogues. This Bill did not pass in Congress.¹¹⁸

While these three bills are useful, they are only a start in terms of what needs to be done to curb the influx of fentanyl from China. Congress has recognized the illicit fentanyl problem and continues to work on new legislation to curb the influx of this deadly drug.

Presently, illicit fentanyl produced in China is shipped to the United States using many methods. Illicit fentanyl can be shipped in small quantities via international mail, privately owned vehicles, air cargo, pedestrians, express consignment carriers (carriers of express freight that move cargo as a commercial service), or the dark web, which enhances

¹¹⁷ Stop the Importation and Trafficking of Synthetic Analogues Act, H.R. 2851, 115th Cong., 2d sess. (June 18, 2018), <https://www.congress.gov/bill/115th-congress/house-bill/2851/text>.

¹¹⁸ Stopping Overdoses of Fentanyl Analogues Act, H.R. 4922, 115th Cong., 2d sess. (February 5, 2018), <https://www.congress.gov/bill/115th-congress/house-bill/4922/text>.

privacy through the use of Bitcoin and anonymous browsing.¹¹⁹ Illicit fentanyl is often shipped in small amounts, which makes it difficult to detect as it crosses the border. Once the drug is across the border, it is transported to distributors and users using traditional methods such as mail or courier services.

Currently, it appears that anyone with an internet connection and a mailing address can connect with drug manufacturing and distribution centers for the purchase of illicit fentanyl. The most common means of transporting of illicit fentanyl include (1) international transportation to the United States and bordering countries, (2) trafficking from Latin America to the United States, (3) domestic trafficking via mail, and (4) trafficking through a seemingly legitimate shipment by misrepresenting shipment contents. The international transport of illicit fentanyl and trafficking from Latin America include products in the finished pill or powder form as well as the transport of chemical ingredients that can be mixed to create the drug. Most illicit fentanyl in the United States comes from China. Much of this is first transported to Mexico or, to a lesser extent, Canada. From there, the drug is illegally smuggled across the border.¹²⁰

E. MEXICO AND FENTANYL

Mexican drug-trafficking organizations (DTOs) have been linked to drug transportation, manufacturing, and distribution. Mexican DTOs have used many different methods to transport illicit fentanyl secretly across the border. The most popular method of transporting illicit fentanyl from Mexico is via personal vehicles that enter at legal points of entry. Tractor trailers are also used to cross at legal points. However, small quantities of illicit fentanyl are easily concealed and carried by “body carriers” across the southwest

¹¹⁹ Office of National Drug Control Policy, “Advisory to the Shipping Industry on the Illicit Movement Methods Related to the Trafficking of Fentanyl and Other Synthetic Opioids” (Washington, DC: Office of National Drug Control Policy, August 21, 2019), <https://www.hsdl.org/?view&did=828472>. The dark web is defined by Dictionary.com as “the portion of the Internet that is intentionally hidden from search engines, uses masked IP addresses, and is accessible only with a special web browser.” “Dark Web,” Dictionary.com, accessed March 8, 2020, <https://www.dictionary.com/browse/dark-web?s=t>.

¹²⁰ O’Connor, *Fentanyl Flows from China*.

border of the United States.¹²¹ Mexican DTOs are already experienced in synthesizing methamphetamines, and this experience has made them equally proficient at synthesizing fentanyl once the ingredients are imported as it is much easier to create than meth.¹²²

For years, Mexican DTOs have had well-established drug-smuggling routes for the transportation of marijuana, methamphetamine, and heroin.¹²³ Mexican DTOs are now using these routes to traffic illicit fentanyl and its derivatives as their sale is more lucrative because smaller amounts can be transported at greater profit. Smuggling 1 kg of fentanyl is the rough equivalent of smuggling 50 kg of heroin. The DEA estimates that the cost to produce 1 kg of fentanyl is \$1,400–\$3,000, which will retail for over a million dollars on the street.¹²⁴ Presumably, with profit margins this large, the trafficking of illicit fentanyl and fentanyl-like substances across the southwest border of the United States will not likely decrease in the near future.

F. FENTANYL SHIPPING

The use of the U.S. Postal Service and private shipping companies to import illicit fentanyl into the country is another popular method of transporting the drug. Internet sales of illicit fentanyl and fentanyl manufacturing substances allow for drugs to be shipped through the mail undetected due to (1) a lack of data and information sharing with international partners, (2) a lack of new technologies to detect and intercept illicit drug transactions, and (3) an increase in the volume of international mail being processed by the U.S. Postal Service.¹²⁵ The volume of mail has increased from 149.5 million parcels in 2013 to 498.3 million in 2017. In 2017, the mail facility at John F. Kennedy International

¹²¹ “How the Deadly Drug Fentanyl Is Making Its Way to the US,” Public Radio International, July 19, 2019, <https://www.pri.org/stories/2019-07-19/how-deadly-drug-fentanyl-making-its-way-us>.

¹²² Public Radio International.

¹²³ Leslie Cooley Dismukes, “How Did We Get Here? Heroin and Fentanyl Trafficking Trends: A Law Enforcement Perspective,” *North Carolina Medical Journal* 79, no. 3 (May 2018): 181–84, <https://doi.org/10.18043/nmc.79.3.181>.

¹²⁴ Public Radio International, “Fentanyl Is Making Its Way to the US.”

¹²⁵ Office of National Drug Control Policy, *National Drug Control Strategy* (Washington, DC: Office of National Drug Control Policy, 2019), <https://www.hsdl.org/?abstract&did=820881>.

Airport discovered a white powdery substance in a package destined for Pennsylvania. When tested by the Department of Homeland Security, the substance was identified as fentanyl, which was later proven to have been shipped from China. The individual who was meant to receive the package had shipped more than 14 such packages to family members across the country.¹²⁶ Considering the high volume of mail that is shipped across the country each day, one can safely assume there are many packages containing illicit fentanyl in transit this very minute.

Packages are often transported via legitimate means by misrepresenting the actual contents. In 2018, a man in Florida overdosed and died after using a container that had been labeled “nasal spray,” which he intentionally purchased and received through the U.S. Postal Service. The item had been purchased on the dark web and mislabeled to conceal its contents to fool postal inspectors. Investigations of the victim’s home revealed he had made several purchases of the drug using the internet and mail.¹²⁷ The suspect who sold the disguised fentanyl had hundreds of spray bottles and labels depicting the contents as nasal spray. The persons using the spray purchased it knowing it contained illicit fentanyl. The U.S. Postal Inspection Service reports that in an average year, approximately 1,000 suspects are arrested for drug trafficking using the mail system due to the misrepresentation of the contents of packages. Presumably, the number of persons shipping illicit fentanyl thought the mail is much higher as the U.S. Postal Service is responsible for over four billion pieces of mail each year. It is impossible to determine those who are not apprehended sending illicit fentanyl through the mail, but given the volume of mail, it is reasonable to suspect a significant number. The U.S. Postal Inspection Service admits in

¹²⁶ “Alleged Philadelphia Fentanyl Distributor Arraigned on Federal Drug Trafficking Charges,” Immigration and Customs Enforcement, July 12, 2017, <https://www.ice.gov/news/releases/alleged-philadelphia-fentanyl-distributor-arraigned-federal-drug-trafficking-charges>.

¹²⁷ Ed Treleven, “Feds Charge Man Suspected of Mailing Fentanyl-Infused Nasal Spray, Including to a Man Who Died,” Capital Newspapers, March 13, 2018, https://madison.com/news/local/courts/feds-charge-man-suspected-of-mailing-fentanyl-infused-nasal-spray/article_01e0eeb7-224d-5abe-800a-49eb5503390d.html.

its 2018 annual report that although it has made great advances in intercepting illicit fentanyl, it has a long way to go.¹²⁸

G. ILLICIT FENTANYL: CURRENT CANADIAN RESPONSE

The Canadian homeland security agencies that manage the fentanyl crisis vary their approaches depending on the perspective of the epidemic as either a health care or drug problem. Canada views the illicit fentanyl problem as a health care issue. Health Canada and the Public Health Agency of Canada are the primary agencies dealing with the opioid crisis as it affects persons physically in Canada. The Public Health Agency of Canada website lists multiple videos, statistics, and general instructions for dealing with the crisis. Federal agencies, such as the Royal Canadian Mounted Police, Canadian Department of Justice, and Canada Border Security, are responsible for policing and enforcing the laws regarding illegal drug possession and use at the national level. However, all their websites address fentanyl and the opioid crisis to some extent, mostly with informational videos and instructions for identifying the drug. The Royal Canadian Mounted Police offer tips in speaking with youth and actions to take in suspected overdoses. Canada also has fire and law enforcement agencies at the provincial, territorial, and indigenous levels, each providing information and services for the fentanyl crisis.

Among the provinces, British Columbia has experienced the greatest impact from the fentanyl crisis, with 65 percent of all overdoses being fentanyl related.¹²⁹ British Columbia is expanding its fentanyl emergency response to include more federal support, so it can keep up with the crisis at the provincial level.¹³⁰ Vancouver Police Department has developed specific recommendations to combat the crisis and was one of the first policing agencies in Canada to do so.

¹²⁸ U.S. Postal Inspection Service, *Annual Report FY2018* (Washington, DC: U.S. Postal Inspection Service, 2019), <https://www.uspis.gov/wp-content/uploads/2019/05/2018-AR.pdf>.

¹²⁹ Vancouver Police Department, *Opioid Crisis: The Need for Treatment on Demand* (Vancouver: Vancouver Police Department, May 2017).

¹³⁰ Vancouver Police Department.

Regarding homeland security, Canada has created inter-agency partnerships between federal, local, and indigenous agencies. Through these partnerships, Canada has created enforcement groups that target organized crime and increase public awareness. Canada has used these partnerships to create projects that have resulted in seizures of fentanyl, other drugs, paraphernalia, weapons, and cash. The Canadian Centre for Substance Abuse is a federal agency that focuses on education and shared learning for first responders, healthcare workers, and law enforcement agencies. Its website delivers daily updates on the topic of fentanyl use, locations of tainted drugs, and opportunities for collaboration between entities. Canada's response to the fentanyl crisis began by studying the model that the United States had been developing. There are similarities between the Canadian and U.S. response to the opioid crisis among law enforcement, fire rescue, and federal agencies; however, Canada has developed several programs that are unique and not practiced in the United States.

The present situation regarding illicit fentanyl is multifaceted. Although years ago, it would have been difficult to predict that illicit fentanyl would affect so many lives in North America, clearly, the drug has manifested at America's borders via the U.S. Postal Service, freight delivery systems, and the dark web. The manufacture of illicit fentanyl in China and the transport of illicit fentanyl to Mexico and then across the border into the United States is a reality. The spread of illicit fentanyl into Canada and its current method of handling the crisis are worthy of further examination and, perhaps, will lead to stronger partnerships across the two countries. Moreover, educating communities about the presence of illicit fentanyl in all types of drugs, as well as the methods of manufacture and transport and the increase in its deadliness, may help change the current path in which the epidemic is headed.

V. RISK TO PUBLIC SAFETY ENTITIES AND FIRST RESPONDERS

A. LAW ENFORCEMENT AND ILLICIT FENTANYL

The illicit fentanyl influx has created multiple new problems for law enforcement. Preventing exposure to the drug has been one of the most important issues. This has created a change in traditional tactics from basic street-level operations to tactical operations. Law enforcement agencies have warned their officers to take extra measures to protect themselves during traffic stops, arrests, and drug-related search warrants.¹³¹ Due to these threats, as early as 2010, many law enforcement agencies began to carry the drug naloxone (Narcan), which can be used to treat overdoses and exposures to fentanyl and its analogs. Naloxone works by reversing the effects of fentanyl exposure and can be easily carried and administered as a nasal spray.¹³² Naloxone is available through grant funding; however, the price of the medication has risen exponentially due to its demand and, in some cases, is difficult to acquire.¹³³ For officers to carry and deploy Narcan, they must go through a training program that also entails spending time and money.

Law enforcement agencies are backlogged with cases, which has caused delays in testing seized illicit fentanyl. For example, the Arizona Department of Public Safety no longer allows troopers to use in-the-field testing of suspected drugs as it may affect trooper safety. All suspected drugs now must be sent to the Department of Public Safety laboratory to be tested in a safe environment. This has caused a backlog of over 2,000 controlled substances, which have delayed testing. This delay causes criminal cases to be stalled and

¹³¹ Police Executive Research Forum, *Unprecedented Opioid Epidemic: As Overdoses Become a Leading Cause of Death, Police, Sheriffs, and Health Agencies Must Step Up Their Response* (Washington, DC: Police Executive Research Forum, September 2017), <https://www.policeforum.org/assets/opioids2017.pdf>.

¹³² Michele Coppola, "Police Preventing Opiate Drug Overdose Deaths," *TechBeat* (January/February 2014): 14, <https://www.hsdl.org/?view&did=752947>.

¹³³ Vimont, "Need for Multiple Naloxone Doses on the Rise."

hinders the prosecutor's ability to file formal charges in time.¹³⁴ It also causes delays in testing for driving under the influence and sexual assault cases. Other drug testing labs across the country are experiencing the same problem.¹³⁵ Law enforcement agencies across the country are attempting to solve these problems associated with the illicit fentanyl crisis.

B. FIRE RESCUE AND EMERGENCY MEDICAL SERVICES

Due to the introduction of illicit fentanyl into communities and the increased number of fentanyl-related overdoses and deaths, fire rescue and emergency medical services (EMS) agencies have been forced to respond to the crisis in different ways. This epidemic has created situations in which emergency crews might be dispatched to a call referencing one overdose victim only to discover multiple patients at the scene. Frequently, victims are found unconscious or in cardiac arrest due to ingestion of the illicit fentanyl.¹³⁶ The call volume has increased in many metropolitan areas, causing delays in emergency ambulance response. System-wide increases in call volume and the need to transport all overdose patients are causing delays in emergency response. The CDC reported a 29.7 percent increase in overdoses transported to emergency rooms from July 2016 to September 2017.¹³⁷ Demand for emergency services due to the increased number of emergency calls is overwhelming the supply of personnel and transport units. Delays caused by a lack of bed space in emergency rooms also contributes to the issue as EMS becomes unable to deliver patients and go back in service for calls. Often, EMS is forced

¹³⁴ Jason Pohl, "Fentanyl Fears Force DPS Policy Change, Plus a Backlog," *Arizona Republic*, September 25, 2017, <https://www.pressreader.com/usa/the-arizona-republic/20170925/281487866537866>.

¹³⁵ "Shaheen Announces Legislation to Address Heroin & Fentanyl Backlog at Police Forensic Labs," Official website of Senator Jeanne Shaheen, October 30, 2015, <https://www.shaheen.senate.gov/news/press/shaheen-announces-legislation-to-address-heroin-and-fentanyl-backlog-at-police-forensic-labs>.

¹³⁶ David Boddiger, "Fentanyl-Laced Street Drugs 'Kill Hundreds,'" *Lancet* 368, no. 9535 (2006): 569–70, [https://doi.org/10.1016/S0140-6736\(06\)69181-2](https://doi.org/10.1016/S0140-6736(06)69181-2).

¹³⁷ Vivolo-Kantor et al., "Trends in Emergency Department Visits for Suspected Opioid Overdoses."

to divert to a hospital farther away to drop off patients due to overcrowding, further decreasing unit availability and increasing response delays.¹³⁸

The following hypothetical scenario clarifies the cause and effect of the delay in response due to the call volume increase. At 2:06 a.m., emergency tones sound at the fire station, and an ambulance is dispatched along with a fire engine as the engine is needed to supply manpower. The responding emergency crew recognizes the address as it has been to the home three times over the past several shifts. The crew assumes that this is going to be a drug overdose, so it notifies law enforcement to respond with an officer. The police officer requests a second officer to respond as she knows that the address is a haven for illegal drug use, and she requires back-up. At 2:14 a.m., the call center receives another call for an overdose at a different address. The same response is requested: one engine, one ambulance, and two officers. Minutes later, another 9-1-1 call comes in for a person having chest pain. The ambulance, fire engine, and police officers who are responsible for the area in which the third call is received are unavailable as they are assigned to the two overdose calls. The emergency units that would have normally responded in their place are busy with the second overdose call, making them unavailable. The delay in response to the chest pain call is significant. Assuming it takes 13 minutes for out-of-area responders to arrive, the chest pain patient does not survive due to the delay. This type of delay presumably repeats itself daily throughout this country due to the influx and use of illicit fentanyl and the increased numbers of overdoses caused by the drug.

C. ILLICIT FENTANYL AND THE DEPARTMENT OF HEALTH

Local health departments and agencies across the country have been working to combat the effects of illicit fentanyl. Harm reduction is the goal of many of health departments. Primarily, overdose education, Narcan distribution, and drug diversion programs have been the focus. Programs have been established and initiated focusing on the negative consequences associated with illicit fentanyl. Much of the health departments'

¹³⁸ S. Trzeciak and E. P. Rivers, "Emergency Department Overcrowding in the United States: An Emerging Threat to Patient Safety and Public Health," *Emergency Medicine Journal* 20, no. 5 (2003): 402–5, <https://doi.org/10.1136/emj.20.5.402>.

work has entailed the collection of data from various agencies, such as medical examiner, overdose scene, and medical reports.¹³⁹ Health departments are also attempting to provide access to treatment programs and to distribute naloxone.¹⁴⁰ Although health departments have been aggressively combatting the issues, overdose numbers continue to rise.

D. THE RISING COSTS OF THE EPIDEMIC

Public safety entities such as police, fire, EMS, and health department–based systems and hospitals are now facing an associated issue caused from illicit fentanyl: cost. Guidelines published in one safety report for first responders recommends using personal protective equipment, decontamination methods, medical countermeasures, and training. New items such as disposable nitrile gloves (\$18 for a box of 90), nasally administered naloxone (\$140 on average for two doses), sleeve covers, and P100 disposable respirators (\$14 each) with non-vented goggles are among the list of suggested equipment to respond to overdoses in the presence of fentanyl.¹⁴¹ The CDC created a training video and a list of safety recommendations as well as a comprehensive list of special training that departments should conduct. Included in its recommendations are details and a video showing how to treat and decontaminate K-9 working dogs. The CDC’s Inter-Agency Board went as far as recommending that working dogs be removed from areas where there is suspected illicit fentanyl. Consequently, all these recommendations require agencies to purchase equipment and train personnel, thus further impacting agency budgets. Restricting the use of K-9 working dogs further restricts operations and lengthens scene times.¹⁴² Furthermore, some agencies are requiring hazardous materials teams to respond to drug warrant calls as well

¹³⁹ Nicholas J. Somerville et al., “Characteristics of Fentanyl Overdose—Massachusetts, 2014–2016,” *Morbidity and Mortality Weekly Report* 66, no. 14 (2017): 382–86, <https://doi.org/10.15585/mmwr.mm6614a2>.

¹⁴⁰ Brendan Saloner et al., “A Public Health Strategy for the Opioid Crisis,” *Public Health Reports* 133, no. 1 suppl. (2018): 24S–34S, <https://doi.org/10.1177/0033354918793627>.

¹⁴¹ InterAgency Board, “Recommended Best Practices to Minimize Emergency Responder Exposures to Synthetic Opioids, Including Fentanyl and Fentanyl Analogs” (Arlington, VA: InterAgency Board, October 2017, <https://www.hsdl.org/?abstract&did=805234>).

¹⁴² “Illicit Drugs, Including Fentanyl,” Centers for Disease Control and Prevention, February 11, 2020, <https://www.cdc.gov/niosh/topics/fentanyl/risk.html>.

as to overdose scenes as a precaution. These costs require either an increase in agency budgets or a decrease in agency services. Either choice affects the community as a whole, even if it has never heard of illicit fentanyl.

Naloxone is the drug of choice to treat the effects of opioid and fentanyl exposure and overdose. Naloxone has been used in hospital settings since the early 1970s, primarily for morphine and heroin overdoses, and has been regularly carried by EMS units staffed with paramedics since the 1980s. In 2014, under the brand name Narcan, a nasal spray was designed for intranasal administration to assist the lay person with easy administration without the need for needles.¹⁴³ The availability of the nasal spray, however, may be contributing to an underreporting of overdoses. Occasionally, EMS will be dispatched to an overdose call only to be cancelled prior to arrival presumably because nasal Narcan was deployed.

A typical dose of naloxone used to reverse suspected overdose is .4 to 2 mg. However, with the introduction of illicit fentanyl into the market, some cases have required 10 mg or more to reverse the effect of fentanyl due to the varying strength and concentration.¹⁴⁴ The increase in illicit fentanyl exposure, coupled with the need for higher dose administration due to illicit fentanyl's concentration, and the new availability to non-medical personal such as police and the lay person have increased the demand for the drug, thus increasing the price. Although grant funding is available for public entities, the cost for the grants eventually is passed on to the community. Police agencies state that if grant funding is not available, the cost is usually passed on to another department in the city.¹⁴⁵ Presumably, local municipalities must adjust budgets or decrease services to cover the increasing cost of the medication. Pharmaceutical companies claim that the general public

¹⁴³ Jody Morgan and Alison L. Jones, "The Role of Naloxone in the Opioid Crisis," *Toxicology Communications* 2, no. 1 (2018): 15–18, <https://doi.org/10.1080/24734306.2018.1458464>.

¹⁴⁴ Matthew R. Jordan and Daphne Morrisonponce, "Naloxone," in *StatPearls* (Treasure Island, FL: StatPearls Publishing, 2019), <http://www.ncbi.nlm.nih.gov/books/NBK441910/>.

¹⁴⁵ Leo Beletsky, "Engaging Law Enforcement in Opioid Overdose Response: Frequently Asked Questions" (Washington, DC: Bureau of Justice Assistance, September 2014), <https://bjatta.bja.ojp.gov/naloxone/engaging-law-enforcement-opioid-overdose-response-frequently-asked-questions>.

can afford naloxone as insurance usually covers 80 percent of the cost.¹⁴⁶ Eventually, this cost gets passed on to the non-fentanyl user, once again bringing to light that the illicit fentanyl epidemic affects everyone, not only the drug user. Figure 6 illustrates the increase in price for Fort Lauderdale Fire Rescue over four years.

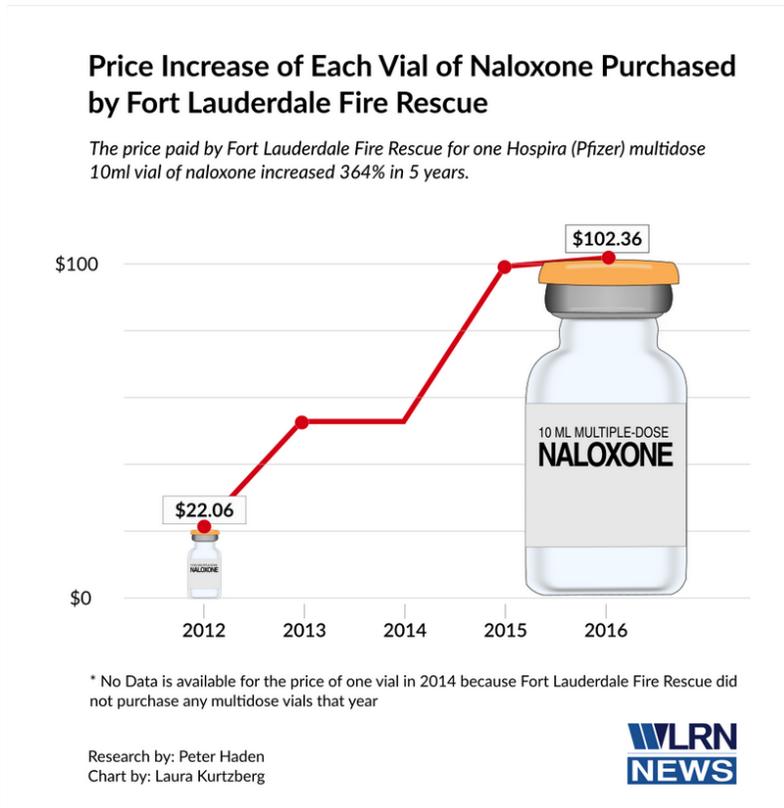


Figure 6. Price Increase for Naloxone for Fort Lauderdale Fire Rescue¹⁴⁷

Further adding to the rising cost passed on to public health agencies, data from the National Vital Statistics System shows that the rate of EMS naloxone administration increased over 75 percent between 2012 and 2016. This trend mirrored the close to 79

¹⁴⁶ Jordan and Morrisonponce, “Naloxone.”

¹⁴⁷ Source: Peter Haden, “‘We Can’t Do Without It’: First Responders Pay Soaring Price For Overdose Antidote Naloxone,” LRN Miami, March 11, 2018, <https://www.wlrn.org/post/we-can-t-do-without-it-first-responders-pay-soaring-price-overdose-antidote-naloxone>.

percent increase in opioid mortality during that same timeframe.¹⁴⁸ Presumably, as stronger analogs of illicit fentanyl continue to enter the drug market, naloxone will need to evolve into a more potent antidote.

Illicit fentanyl and its analogs have had a dramatic effect on communities. Fire, law enforcement, and the health care industry have had to change the way in which they respond to emergency calls as well as the way they interface with patients. Operational costs have risen exponentially due to the influx of illicit fentanyl, and prehospital response times and emergency room waiting times have increased. These costs continue to be passed on to communities both financially and from a standard of care perspective. Recognizing these issues and other effects that illicit fentanyl has on the community is imperative to create change. The negative impacts of illicit fentanyl on communities can only be changed when society decides there is a need for intervention through policy reform.

¹⁴⁸ Rebecca E. Cash et al., “Naloxone Administration Frequency during Emergency Medical Service Events—United States, 2012–2016,” *Morbidity and Mortality Weekly Report* 67, no. 31 (2018), <https://www.cdc.gov/mmwr/volumes/67/wr/mm6731a2.htm>.

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VI. CONCLUSION, FINDINGS, AND RECOMMENDATIONS

A. RECOMMENDED POLICY CHANGES

The National Institute of Drug Abuse has estimated that for every dollar spent on drug treatment, in upwards of twelve dollars may be saved in health care and criminal justice costs.¹⁴⁹ This does not include the physical and emotional cost to the drug user, health care provider, and the police department. Programs are in place in the United States, but they are loosely tied together and poorly advertised. The following are recommendations for consideration to combat the fentanyl crisis in the United States.

1. Education and Awareness

A serious issue addressed in this thesis is the fact that many people are exposed to illicit fentanyl without knowing it. They purchase drugs on the street that they believe are prescription medications or regular marijuana. A policy should be put in place to reduce unintentional consumption by creating a warning system about the presence of fentanyl in drug products. This involves making fentanyl test strips available for users. Test strips are inexpensive and can be distributed along with the naloxone that is already being given to drug users. Such programs are in place and should be expanded.¹⁵⁰ Over 90 percent of users ages 18–35 stated they would use the test strips to check for fentanyl-laced medications, suggesting that this is an acceptable harm-reduction strategy.¹⁵¹ Fentanyl test strips are inexpensive, and a simple Google search for “fentanyl test strips” shows prices ranging from 61 cents to one dollar each. The introduction of free test strips, much like the free Narcan that is being distributed within communities, would allow users an inexpensive way to see whether the drugs they have bought contain illicit fentanyl. This program could be paired with educational materials and a “report your dealer” hotline that would introduce

¹⁴⁹ Tara O’Neill Hayes and Ryan Manos, “The Opioid Epidemic: Costs, Causes, and Efforts to Fight It,” American Action Forum, January 30, 2018, <https://www.americanactionforum.org/research/opioidepidemic/>.

¹⁵⁰ Benson, “Researchers to Test Neighborhood-Based Interventions.”

¹⁵¹ Krieger et al., “High Willingness to Use Rapid Fentanyl Test Strips.”

and encourage users to report dealers who are lacing drugs with illicit fentanyl to an anonymous law enforcement forum. This forum could offer the incentive of receiving an award if there is an arrest. The award for reporting dealers might include placing the informant in a valid licensed rehabilitation program at no cost.

Currently, some community health departments are distributing naloxone to users so it can be used to reverse overdoses of illicit fentanyl. The distribution of fentanyl detection strips has already been proven by some studies to be a better way to prevent users from ingesting the drug, thus preventing the overdose. Naloxone and fentanyl test strip distribution sites should also dispense information regarding rehabilitation and recovery centers. The information distributed could offer a telephone hotline to report abuse by facilities that are preying on addicts seeking help.

Information concerning the dangers of illicit fentanyl as well as information regarding illicit fentanyl being clandestinely put into marijuana and other drugs needs to be advertised in mainstream media. Similar campaigns have been put in place regarding the dangers of smoking cigarettes and chewing tobacco. Tobacco company court settlements have included the creation of campaigns to deter youth from smoking. The ads consistently promote negative attitudes about smoking and are funded by tobacco companies.¹⁵² Similar settlements regarding pharmaceutical companies should be used to fund aggressive informational campaigns detailing the dangers and presence of illicit fentanyl. Accompanying the information program focused on the illicit fentanyl user, there should be an informational campaign put in place like the one implemented by the Maryland Department of Health. The department implemented a successful program in 2016 that incorporated public service announcements and training for all city employees in recognizing overdoses and deploying naloxone.¹⁵³

¹⁵² Matthew C. Farrelly et al., “Getting to the Truth: Evaluating National Tobacco Countermarketing Campaigns,” *American Journal of Public Health* 92, no. 6 (2002): 901–7, <https://doi.org/10.2105/AJPH.92.6.901>.

¹⁵³ Forseth, “Fentanyl and Overdose: Harm Reduction Strategies.”

Drug programs and grant funding exist; however, they are not well advertised to first responders and cities. There needs to be outreach and communication to city and county organizations so that appropriated funds can be used to handle the issue directly. Centralizing a command center for the fentanyl crisis will allow for a “one stop shop” for those who are working in their communities to stop the crisis. The current system of multiple agencies fighting the same battle might be compared to 9/11 interagency communication. It is time to get all involved and on the same page.

The D.A.R.E. program needs to focus on one or two issues. Currently, D.A.R.E. receives over one billion dollars a year in funding, and the program is constantly scrutinized for its ineffectiveness. The D.A.R.E. program needs to be reevaluated and not held as the gold standard for anti-drug curricula. Programs such as ANGEL and Hope Not Handcuffs need to be considered for implementation nationwide. These programs target users who want assistance. However, these programs will need funding so that patient rehabilitation is long term and prevents relapse. Dispersing some of the D.A.R.E. funding to drug-specific programs may assist in the battle against illicit fentanyl.

Educational programs must be made available and target specific drugs and drug addiction. The responsibility falls on those educated about the fentanyl crisis to educate those who are unaware of the problem. If a community experiences a significant increase in illicit fentanyl overdoses, that information must be shared with drug users, so they will be aware of the issue. The information would notify users of fentanyl-tainted products in the area.

Large-scale strategies to combat the fentanyl problem need to be put in place to target both the use and production of the drug. Policymakers must review successful policies and programs already in place when addressing issues with fentanyl in the community. Furthermore, unsuccessful programs and policies should be reviewed, revamped, or terminated and replaced. The focus on use reduction and harm reduction is paramount in combatting this crisis.¹⁵⁴ Placing emphasis on treating the user as a victim of addiction rather than as a criminal may help to curb use and break the cycle of addiction.

¹⁵⁴ Kuczyńska et al., “Abuse of Fentanyl.”

2. First Responder Safety

The presence of illicit fentanyl has been proven a risk to first responders. Policymakers need to continue risk education programs for first responders.¹⁵⁵ Municipalities should create heat maps of overdoses to pinpoint areas of high risk. This information could be included in computer aided dispatch notes to notify responders they are in an area of high risk for exposure (see Figure 7). This heat map correlates high overdose rates with locations in Wilton Manors to which Fort Lauderdale provides emergency services. Moreover, compared with similar maps from the police department, this map corresponds with areas of higher crime and the locations of multiple recovery and rehabilitation homes. Such information can better prepare responders for dangers they may face upon arrival on scene.

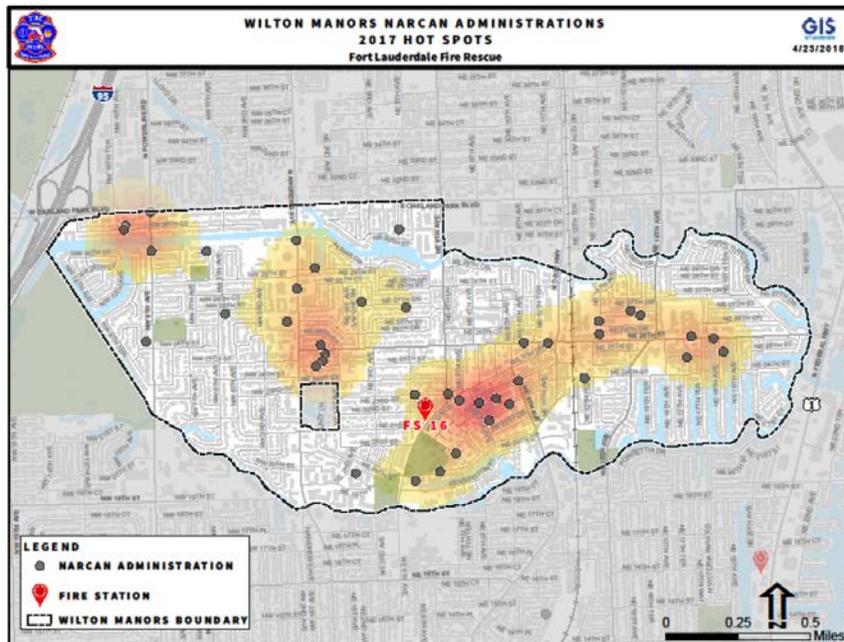


Figure 7. Heat Map of Narcan Administrations in Fort Lauderdale Area¹⁵⁶

¹⁵⁵ Drug Enforcement Administration, *Fentanyl*.

¹⁵⁶ Source: Fort Lauderdale Fire Rescue, "Wilton Manors Narcan Administrations 2017 Hot Spots" (unpublished heat map, April 23, 2018).

The risk to first responders can be further reduced by changing current tactics. Special weapons and tactics operations involving suspected drug houses should include the staging of resources such as hazardous materials teams and standby rescue ambulances in the event officers are exposed. Law enforcement and EMS should also be trained in the proper use of naloxone for police dogs, which are also at high risk to illicit fentanyl exposure. Explosives such as flash bang grenades should not be used during dynamic entry into occupancies where illicit fentanyl is involved as it may aerosolize the drug, further exposing officers. Personal protective equipment should be made available for law enforcement operators when they are forced to make a dynamic entry into a suspected drug lab.

3. Testing for Illicit Fentanyl

There is a serious problem mentioned in this thesis regarding testing and data collection for illicit fentanyl. The issue involves two types of testing: (1) testing of suspected overdose patients in the emergency room and (2) testing of seized illicit fentanyl that could be used for prosecution of dealers.

Presently, most emergency rooms do not routinely test for illicit fentanyl in overdose cases even though it is recommended by the DEA. The DEA has not made the testing mandatory presumably due to the costs involved that would be passed on to hospitals and patients.¹⁵⁷ Heroin, like illicit fentanyl, is an opiate and will test positive when applied to a standard emergency room “drug of abuse” test or point of care toxicology screening test in urine. This test is commonly used for suspected overdoses in hospital emergency departments.¹⁵⁸ However, if the patient’s overdose is caused by the ingestion of illicit fentanyl, the toxicology will read positive only for opioids, leaving one to assume illicit fentanyl was involved. A lack of proper testing will lead to false reporting and skewed statistics, possibly impede law enforcement in the apprehension of distributors, and prevent

¹⁵⁷ Catherine A. Hammett-Stabler, Amadeo J. Pesce, and Donald J. Cannon, “Urine Drug Screening in the Medical Setting,” *Clinica Chimica Acta*, 315, no. 1 (2002): 125–35, [https://doi.org/10.1016/S0009-8981\(01\)00714-8](https://doi.org/10.1016/S0009-8981(01)00714-8).

¹⁵⁸ Hammett-Stabler, Pesce, and Cannon.

public health and first responders from identifying overdose trends, leaving them unable to provide invasive assistance.

Illicit fentanyl testing in the field of law enforcement is dangerous, and the kits are often inaccurate.¹⁵⁹ Therefore, law enforcement agencies are often forced to send their seized cache to either county or state laboratories for testing using spectroscopy technology or gas chromatography. The machines for these procedures are expensive, so there are few outside larger police agencies. This scarcity has created the problem of backlogs of evidence testing, which have led to cases being dropped or not prosecuted in a timely manner. One recommendation to alleviate this problem would be to fund testing equipment for individual law enforcement agencies. Machines such as the TruNarc and Bruker Alpha machine use spectroscopy technology to identify the different components that make up a drug. A spectroscopy is an instrument used to analyze the components or parts of a sample by separating its parts across a spectrum. Spectroscopy detects molecular vibrations to determine the chemical makeup of a substance such as its chemical composition.¹⁶⁰ Specifically, the Bruker Alpha machine appears easiest and safest to use. It can detect the main components and differentiate drug mixtures and give a percent combination of the substances contained therein.¹⁶¹ Direct analysis in real-time mass spectrometry has the capability of quickly detecting fentanyl and 16 of its analogs down to the nanogram and picogram. Quick analysis by individual law enforcement agencies would allow police and community services to get information out to the drug-consuming population in the hopes that users would alter their drug habits, armed with the knowledge that there is illicit fentanyl in their drug supply. Furthermore, when specific information regarding the composition of the seized drug is placed on a heat map, it could be used to assist police in identifying the districts of different dealers. Presumably, if this information were applied to the national level, mapping would allow law enforcement at all levels to track movement and distribution patterns across the country. This information, if shared correctly, could

¹⁵⁹ Pohl, "Fentanyl Fears Force DPS Policy Change."

¹⁶⁰ Sherman et al., *Fentanyl Overdose Reduction Checking Analysis Study*, 8.

¹⁶¹ Sherman et al.

forecast future overdoses and illicit fentanyl use in cities across the country. Such a forecast would be possible as analysts track where the epidemic started and the direction of the drug's movement. Furthermore, law enforcement agencies could use the technology quickly, speeding up the process for prosecuting drug dealers, especially drug dealers whose sales resulted in death. This may have a positive effect on limiting overdoses and presumably decrease illicit fentanyl sales.

4. Assistance Programs

There is a serious issue with getting illicit fentanyl users the help that they need. Programs across North America have proven useful; however, they have not been standardized or practiced in all areas. A policy that should be implemented is the national initiation of the Law Enforcement Assisted Diversion (LEAD) Program, which was first implemented in Seattle and has been adopted in 30 states.¹⁶² The program has been so successful in the United States that Vancouver, Canada's illicit fentanyl capital, has implemented the plan as well.¹⁶³ The program allows law enforcement to give persons caught using drugs the option of arrest or placement into the LEAD Program. Once the LEAD Program option is chosen, a case worker immediately reports to the scene. Addicts are then taken directly to a treatment center, where they are evaluated and placed at a proper rehabilitation facility. One suggestion to improve this program would be to pair the addict with a recovered addict upon dismissal from the program to demonstrate it is possible to escape the cycle of illicit fentanyl use. As the Narcotics Anonymous saying goes, "One addict helping another is without parallel."¹⁶⁴ In other words, there is no greater way to recover than by connecting with someone else who has been there.

¹⁶² National District Attorneys Association, "Opioid Epidemic: A State and Local Prosecutor Response" (Washington, DC: National District Attorneys Association, October 12, 2018), <https://ndaa.org/wp-content/uploads/NDAA-Opioid-White-Paper.pdf>.

¹⁶³ Global Commission on Drug Policy, *The Opioid Crisis in North America* (Geneva: Global Commission on Drug Policy, October 2017), 9, <http://www.globalcommissionondrugs.org/wp-content/uploads/2017/09/2017-GCDP-Position-Paper-Opioid-Crisis-ENG.pdf>.

¹⁶⁴ "Alcoholics Anonymous, Narcotics Anonymous May Benefit Adolescents Too," *Hindustan Times*, June 2, 2008, ProQuest.

A disturbing revelation of this thesis was that many recovery and rehabilitation facilities are taking advantage of the illicit fentanyl crisis to make money without providing treatment. Victims of illicit fentanyl addiction, once they decide to get help, often become victims of the rehabilitation system. The codependency of the recovery homes and rehab facilities requires a major policy change. The process of marketing to those desperate for help and hiring former addicts to recruit and act as brokers, which takes addicts to the highest bidder, must change. Predatory rehab facilities lure addicts into their programs using marketing plans that show luxury recovery facilities or even offer flights and free or reduced rent to unknowing addicts looking to break free of their addiction. The addict is placed into a “sober home,” which is often linked to or even owned by the rehab facility. Residents pay weekly rent and can be evicted at any time by the owner if they do not go to their recommended treatment facility. In essence, the sober homes are marketing for the rehab facilities and often receive monetary kickbacks.¹⁶⁵ Facilities even offer monetary compensation per referral to “brokers” who lure addicts to specific facilities, thus selling patients to the highest bidder.

Presently, this is not an illegal practice, and there are no limits on how much a center can pay a broker.¹⁶⁶ Policymakers need to create a national standard for these recovery facilities. Licensing and inspections must become the norm in the industry. Such a financial relationship between recovery, rehab, and brokers should be made illegal and prosecuted to the extent of the law. Overdose patients who survive to the emergency room should be interviewed to see whether they have been in a rehabilitation program and, if so, reveal the location of the rehabilitation facility. The Department of Health must follow up on licensed facilities to determine whether they are operating efficiently and whether their recidivism rate is acceptable.

¹⁶⁵ National District Attorneys Association, “Opioid Epidemic.”

¹⁶⁶ National District Attorneys Association.

5. Change Policy from Law Enforcement to Public Health

The illicit fentanyl problem is an issue that needs addressing as a law enforcement problem from the supply side. However, on the user side of the illicit fentanyl crisis, consideration must be made to address the problem from public health perspective. The war on drugs does affect the issue from the arrests and imprisonment perspective, but imprisonment does not necessarily reduce the amount of illicit fentanyl on the streets.¹⁶⁷ Addressing the issue by moving beyond the moral and disciplinary approach to drug addiction could help reduce the public stigma and increase the willingness to accept treatment.¹⁶⁸ This is relevant to the illicit fentanyl user and society as a whole. A public health approach should address why the person is using drugs, where they are using them, and the context in which use is increasingly causing overdoses and becoming lethal.

B. FINDINGS

Illicit fentanyl and its analogs present a serious threat to U.S. homeland security. The research presented has shown that illicit fentanyl draws funds, resources, and manpower from every level of society. From assets that are deployed to prevent the influx of illicit fentanyl across the border to local first responders, health care agencies, and law enforcement, all are negatively affected by this crisis. Increases in the price of medications and the acquisition of new equipment drain community budgets that are already preparing for other potential tragedies such as home-grown terror groups and active shooter situations.¹⁶⁹

Furthermore, the potency of illicit fentanyl and its methods of administration and ingestion present a threat to homeland security, too. The weaponization of illicit fentanyl is extremely possible. This was proven on May 3, 2003, when Russian tactical teams used fentanyl in gas form to eliminate a Chechen terrorist threat at a Moscow theatre, killing all

¹⁶⁷ Saloner et al., “A Public Health Strategy for the Opioid Crisis.”

¹⁶⁸ Saloner et al.

¹⁶⁹ Hayes and Manos, “The Opioid Epidemic.”

the terrorists and nearly 204 hostages.¹⁷⁰ Evidence has also been presented in this thesis regarding accidental exposure to illicit fentanyl that resulted in treatment and hospitalization of first responders. Hospital emergency rooms are also often crowded with illicit fentanyl overdose cases, which drain resources that could be used to treat other patients.¹⁷¹ Presumably, this overcrowding and limitation of resources would affect an onslaught of a disease such as the Coronavirus, which will surely overwhelm current resources.

Illicit fentanyl addiction is a symptom of a much larger problem. Treating the symptom, not the root cause of the problem, will not fix the issue. The solution to this crisis is not simply the removal of the illicit drug fentanyl. Illicit fentanyl and its analogs, like heroin and other non-synthetic opioids, work by binding to the opioid receptors in the body of an organism. These receptors are in the areas of the body that are responsible for pain and emotion.¹⁷² The drug then produces effects such as happiness, sedation, and confusion. Over time, the receptors build up a tolerance to the drug, requiring the user to administer an increased dose to attain the desired effect. This eventually results in a physical dependence. Physical dependence means that with an abrupt discontinuation of the drug, there will be severe withdrawals.¹⁷³ The *British Journal of Anesthesia* notes that fear of these withdrawals is one of the “major forces behind persistent drug abuse in addicts.”¹⁷⁴ Presumably, physical and mental addiction played a major role in the increase of heroin and fentanyl abuse after the crackdown on pill mills in the late 1990s. Addicts were cut off from their supply and needed to find an alternative to the once readily available pills. Illicit fentanyl—readily available and with near identical effects as oxycodone and heroin, not to

¹⁷⁰ John J. Donahoe, “The Moscow Hostage Crisis an Analysis of Chechen Terrorist Goals,” *Strategic Insights* 2, no. 5 (May 2003): 5.

¹⁷¹ Eckstein and Chan, “The Effect of Emergency Department Crowding.”

¹⁷² Drug Enforcement Administration, “Acetyl Fentanyl” (Washington, DC: Drug Enforcement Administration, October 2018), https://www.deadiversion.usdoj.gov/drug_chem_info/acetylfentanyl.pdf.

¹⁷³ B-J. Collett, “Opioid Tolerance: The Clinical Perspective,” *British Journal of Anaesthesia* 81, no. 1 (1998): 58–68, <https://doi.org/10.1093/bja/81.1.58>.

¹⁷⁴ Collett, 62.

mention exponentially more powerful than organic opioids—was a cheap substitute to satisfy the addicts’ starving opioid receptors. Subsequently, removing the drug without replacing it created another evolution of the drug marketplace. These alternative marketplaces for drugs create opportunities for nefarious people to exploit funds gained through the drug trade for use against the United States. The treatment of addiction is key to America’s homeland security as the fall in demand of the drug will seemingly decrease the need for supply, thus breaking the flow of funds to potential terror organizations.

There have been some limitations associated with this thesis. The dynamic nature of the subject created a steady flow of information ranging from current drug seizures to new policy implementations. At times, the onslaught of information changed the direction of the thesis, requiring a refocus on the part of the researcher. However, despite these limitations, the purpose of presenting the cause of the illicit fentanyl crisis and the reasons that it continues to spread has remained on point. The information provided should help the reader understand the recommendations provided and, with any luck, inspire more research on the subject and the vision to see potential solutions to the issue.

This thesis used analytical research results to explain the issue of the illicit fentanyl problem currently plaguing North America. The previous chapters addressed fentanyl from its initial manufacture for medical purposes to its transformation into illicit fentanyl and its analogs. In this thesis, facts regarding the effects on communities and emergency response, manufacture and transport, and exploitation of the crisis were presented. This thesis has indicated that the problem of illicit fentanyl has not improved, despite the attention that the crisis has received at many different levels of government. Society must find new methods to combat the illicit fentanyl problem while also dealing with those who are currently addicted. The battle against illicit fentanyl will require policymakers to educate themselves on illicit fentanyl, the start of the crisis, and the current situation both nationally and at the local level. It is necessary that those making decisions understand the problem, or history will repeat itself. Hastily injecting policy without understanding the repercussions fueled the fire of the current illicit fentanyl problem. Without the careful implementation of new policy and a review of its possible repercussions, illicit fentanyl could be replaced with something even worse. It is difficult to conclude that there is a resolution to the illicit

fentanyl crisis. However, it is our responsibility to continue to explore for the solution. Policymakers must learn from past mistakes—if we remove the drug without creating a treatment for those who are addicted, we can be assured that another dangerous issue will replace the current crisis.

Several limitations have already have been realized while forming the foundation for this thesis. The subject is dynamic—more information will likely become available upon the presentation of the final thesis. Furthermore, there will be some difficulty acquiring information regarding the testing of patients for fentanyl in emergency rooms as the information does not exist. Information regarding the exposure of public safety workers to illicit fentanyl is difficult to access due to Health Information Privacy Protection Act regulations, and because much of the information is evidence for prosecution of distributors. In any event, information regarding efforts to stop illicit fentanyl from getting into the country is already public, and new information is released regularly.

C. FUTURE RESEARCH

This thesis covered a broad spectrum of the illicit fentanyl crisis with the goal of explaining how it became a crisis and recommending a policy implementation that could have short- and long-term effects. During the research, there were many opportunities to veer off the path and investigate certain aspects of the illicit fentanyl crisis further. The decision was made that—to properly develop meaningful, acceptable policy suggestions—a presentation of the information detailing the current crisis from its beginnings, the main issues confronting communities, and some of the outside influences regarding the illicit fentanyl crisis were of the highest importance.

Several areas that consistently appeared during the research of this thesis that are deserving of further research include the following:

- Should illicit fentanyl be considered a weapon of mass destruction? Cited in this document are instances in which illicit fentanyl was aerosolized by flash bang grenades during police raids and EMS personnel responded to a call that was thought to be routine but then became an illicit fentanyl incident. These cases exposed the responders and required that they be

treated for possible overdose. Would it be possible for nefarious groups to easily acquire illicit fentanyl for a terror attack using technology such as drones or other unmanned vehicles?

- How do we police the dark web regarding fentanyl analogs and pill presses? These drugs and their associated manufacturing equipment are readily available on the dark web. Is there a way to monitor and prevent the purchase and shipment of illicit fentanyl and its analogs?
- What do we do to prepare for naloxone-resistant fentanyl?
- How can we use technology to detect for illicit fentanyl using the U.S. Postal Service and border crossing points? With most illicit fentanyl crossing the border in vehicles, how can we better equip law enforcement to safely intercept traffickers?
- Is it necessary to address public opinion toward addicts and addiction? Public opinion entertains a full spectrum of opinions on the topic ranging from free distribution of drug paraphernalia to safe drug administration areas and naloxone. However, there are many who think communities should let addicts overdose themselves, thus eliminating the problem.
- If illicit fentanyl and its analogs were made legal to use but illegal to sell or purchase, would that influence the number of overdoses and deaths? This approach would allow law enforcement entities to concentrate on the dealer rather than the addict, possibly giving law enforcement the ability to shift budgetary priorities to attack the supply side of the crisis. There has been much literature written on the subject that supports both sides. It is truly a subject worth investigating further.

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