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The Opioid Crisis- Why Is It So Hard to Tame?

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Tara McLevain

The Opioid Crisis- Why It Is So Hard to Tame?

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Senior Project BIS437-02

Abstract

The opioid Epidemic is largely known around the world, no matter what state or country you are from, chances are you've heard about the problem. Maybe you have experienced it or maybe you know someone who has dealt with opioid addiction. Throughout this paper we are going to discuss several factors directly related to the opioid epidemic. We will talk about the research, impact on society, treatment options, hidden cost and what the outcome could possibly be. This is a growing epidemic in America today that continues to be on the rise. The opioid crisis is costing America billions of dollars in lost taxes. While the overdosing, misuse, and addiction of opioids are on the rise, that means that there are more patients coming into the hospitals, these patients need the medical treatment they deserve but it makes it harder on the staff to do so. The reason being is that they have already built up their immune system and levels of resistance to the drugs, to tolerate more than the normal dosage.

Therefore the staff has to adjust the dosage to higher amounts and to addicts, that is the worst scenario because they are essentially getting the “high” they are anticipating. In some cases outside of a medical facility this is increasing the death rates from overdose. If we can't get this issue under control the future for medicine will be so constricted that ones that truly need their narcotics will not be able to gain access without having a much higher co- pay, or potentially not being able to afford them at all. This is really hard on the patients that have a set monthly income that only can afford a medicine on a budget, and sometimes that medicine can not be supplemented with the generic brands. There are numerous studies and amounts of research on this topic available for our access via books, internet, articles, and many more sources.

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The opioid epidemic is real, it is an ongoing problem and becoming larger day by day. The opioid crisis is on its way to becoming one of the largest problems in America. This paper will cover common known drugs that lead to addiction, and the treatment/prevention of them for future use. Throughout this paper, there will be four things specifically covered. Which drugs are more common than others to become addicted to, why is it such an issue, why can't this crisis be tamed, and how opioids affect the victim, their family, and the community surrounding the victim.

As research shows, and you will learn throughout the entirety of this paper, the opioid crisis is a continuously growing topic that is highly addressed, but yet there is still no grasp on just how out of control it really is. This epidemic is something that will take a very long time to fully grasp the entire concept of it, and how to prevent it. For example, did you know the opioid crisis is costing America billions of dollars in lost taxes? I found an article by German Lopez on vox.com from April 16th, 2019, where Lopez states:

“The opioid epidemic has cost the federal government \$26 billion in lost tax revenues between 2000 and 2016, and the state government \$11.8 billion, according to a new study in Medical Care.”

That particular article was from 2019, being over a year later, that number has definitely increased, due to a lot of factors but one in particular, COVID-19. It is well known that the COVID-19 health pandemic has put the entire nation in a panic, and in that, the opioid epidemic is on the rise. In the article published by Marcelina Jasmine Salvia, DO, Zakary Kelly, MBA on

June 1st 2020 titled “The Escalation of the Opioid Epidemic Due to COVID-19 and Resulting Lessons About Treatment Alternatives” Salvia writes: *“Insights learned from the worsening opioid epidemic due to coronavirus disease 2019, along with necessary social distancing recommendations, suggest an ultimate path to successful treatment by investing in modalities that promote emotional resiliency building and help address the factors that made patients susceptible to opioid reliance in the first place. The arrival of the coronavirus disease 2019 (COVID-19) pandemic has provided an unanticipated haven for the already formidable opioid epidemic. COVID-19—related protective shelter-in-place orders have pushed individuals battling sobriety into isolation and have decreased access to treatment and opportunity for distraction from addictions.1 The addiction community is raising alarms that the current epidemiological climate alone is a risk factor for substance abuse relapse, prompting the New York Times to label the coronavirus pandemic “a national relapse trigger.”2 Thus, social distancing is potentially concealing a surge of opioid abuse, and resulting morbidity and mortality, larger than any we saw before.”*

Research

Let's begin by understanding what an opioid is and how it can be found. According to The National Institute on Drug Abuse *“Opioids are a class of drugs that include the illegal drug heroin, synthetic opioids such as fentanyl, and pain relievers available legally by prescription, such as oxycodone (OxyContin®), hydrocodone (Vicodin®), codeine, morphine, and many others. All opioids are chemically related and interact with opioid receptors on nerve cells in the body and brain. Opioid pain relievers are generally safe when taken for a short time and as*

prescribed by a doctor, but because they produce euphoria in addition to pain relief, they can be misused (taken in a different way or in a larger quantity than prescribed, or taken without a doctor's prescription). Regular use—even as prescribed by a doctor—can lead to dependence and, when misused, opioid pain relievers can lead to addiction, overdose incidents, and deaths."

According to drugfree.org "Opioids are pain-relieving drugs either naturally derived from poppy flowers or lab-made, semi-synthetic substitutes. They work by attaching to particular sites in the brain called opioid receptors, which carry messages to the brain. The message the brain receives is changed, so that pain is no longer perceived as painful. Medications are often formulated in combination with other substances, such as ibuprofen or acetaminophen.[1]

Opioids medication can be administered in a variety of ways, but is most widely available as pills, tablets or capsules.

Commonly known medications include Oxycontin, Percocet, Dilaudid, Demerol and Opana. Prescription opioids are powerful drugs with a high risk for dependency. Taking them in high doses, and/or in combination with other substances — particularly alcohol — can result in life-threatening respiratory distress and death.

Prescription pain relievers can cause drowsiness, constipation and slowed breathing. Taking a large single dose can cause severe respiratory depression (slowed breathing) that can lead to death. Use of prescription pain relievers with other substances that depress the central nervous system, such as alcohol, antihistamines, barbiturates, benzodiazepines, or general anesthetics, increases the risk of life-threatening respiratory depression.

Recent research suggests that, as a whole, opioids are not significantly better than non-opioid pain relievers in relieving acute and chronic pain.[2] This means that alternative options should

first be explored with healthcare providers. If those first-line options are not effective, taken exactly as prescribed, opioid pain relievers can manage pain effectively.

Chronic use or misuse of opioids can result in physical dependence and addiction. Dependence means that the body adapts to the presence of the drug, and withdrawal symptoms occur if use is reduced or stopped. Tolerance to the drugs' effects also occurs with long-term use, so a person misusing prescription opioids must take higher doses to achieve the same or similar effects as experienced initially. Addiction is a chronic, relapsing disorder characterized by compulsive drug seeking and use. The recent epidemic of prescription opioid misuse and abuse has led to increased use of heroin.”

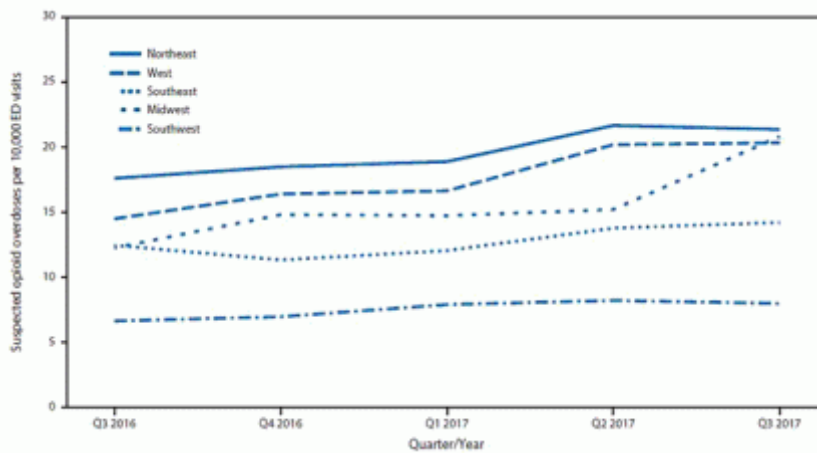
While the overdosing, misuse, and addiction of opioids are on the rise that means that there are more patients coming into the hospitals, these patients need the medical treatment they deserve but it makes it harder on the staff to do so. To better grasp the concept, one may ask when did all this really begin, when did we begin to see the start of the Opioid crisis? According to drugabuse.gov it began...

“In the late 1990s, pharmaceutical companies reassured the medical community that patients would not become addicted to prescription opioid pain relievers, and healthcare providers began to prescribe them at greater rates. This subsequently led to widespread diversion and misuse of these medications before it became clear that these medications could indeed be highly addictive.^{3,4} Opioid overdose rates began to increase. In 2017, more than 47,000 Americans died as a result of an opioid overdose, including prescription opioids, heroin, and illicitly manufactured fentanyl, a powerful synthetic opioid.¹ That same year, an estimated 1.7 million people in the United States suffered from substance use disorders related to

prescription opioid pain relievers, and 652,000 suffered from a heroin use disorder (not mutually exclusive).⁵

What do we know about the opioid crisis?

- Roughly 21 to 29 percent of patients prescribed opioids for chronic pain misuse them.⁶
- Between 8 and 12 percent develop an opioid use disorder.⁶
- An estimated 4 to 6 percent who misuse prescription opioids transition to heroin.^{7–9}
- About 80 percent of people who use heroin first misused prescription opioids.⁷
- Update: Among 38 states with prescription opioid overdose death data, 17 states saw a decline between 2017-2018; none experienced a significant increase.¹¹



Quarterly rate of suspected opioid overdose, by US region

Source: Centers for Disease Control and Prevention. (10)

This issue has become a public health crisis with devastating consequences including increases in opioid misuse and related overdoses, as well as the rising incidence of neonatal abstinence syndrome due to opioid use and misuse during pregnancy. The increase in injection drug use has also contributed to the spread of infectious diseases including HIV and hepatitis C. As seen throughout the history of medicine, science can be an important part of the solution in resolving such a public health crisis.”

One drug in particular that is on the rise and has recently been put on the watch list for potential addiction. This drug is one that was used in one fashion herbal and now, can be potentially fatal if misused. That drug is Kratom. According to www.tandfonline.com, *“Kratom use as a herbal supplement is on the rise in the United States, with reported medical outcomes and lethal effects suggesting a public health threat. Even though the Drug Enforcement Administration has included kratom on its drugs of concern list and the FDA has published a press release to identify it as an opioid with a potential for abuse, its therapeutic and side effects are still not well defined in the literature. Kratom (Mitragnyna speciosa) is a tropical tree grown in Africa and Southeast Asia, which is currently gaining recognition in its contribution toward the opioid crisis. People from these regions have a long history of traditionally using the leaves of kratom to brew tea to help in managing pain and enhance productivity. In addition, the kratom plant has been noted to have dose-dependent stimulant and sedative effects, along with antinociceptive, antidepressant, anxiolytic, and anorectic effects [3]. Kratom misuse is an emerging trend in the Western world, and the wide availability of kratom on the Internet reflects extensive demand for this product. It is especially used by the online community*

to mitigate opioid withdrawal symptoms, self treat heroin/morphine dependence, and for pain relief in patients with chronic pain syndromes who feel stigmatized asking for help [4]. It is available through online vendors between \$10 and \$40 per ounce of plant material sold as a supplement in form of powder or capsules thus posing as an economical alternative to other expensive opioid-replacement medications, such as buprenorphine. Most importantly due to the loose regulation by the FDA, it has gained interest in the market due to its ability to be obtained without a prescription [4].

As the research continues on what are commonly prescribed opioids, you may see on the list found on drugfree.org, titled “More commonly prescribed opioids.” Some of which would come as a shock like over the counter ibuprofen. Go to drugfree.org to find the entire list of commonly prescribed opioid drugs, if you would like to know some more common ones.

Two large contributors to the pandemic commonly seen above are heroin and fentanyl. These drugs are commonly known as the street names Happy Pills, OC, Oxy, Oxycotton, Percs. So for research purposes and to aid in the understanding of a portion of this paper, let us take a second to understand what these particular drugs are, and how they affect the user, and how they are obtained, along with their many common street names.

So what is Fentanyl, we always hear about it, but what is it exactly? According to drugabuse.com/Fentanyl, "*Fentanyl is a powerful synthetic opioid that is similar to morphine but is 50 to 100 times more potent. It is a prescription drug that is also made and used illegally. Like morphine, it is a medicine that is typically used to treat patients with severe pain, especially after*

surgery. It is also sometimes used to treat patients with chronic pain who are physically tolerant to other opioids. Tolerance occurs when you need a higher and/or more frequent amount of a drug to get the desired effects. In its prescription form, fentanyl is known by such names as Actiq®, Duragesic®, and Sublimaze®. Street names for illegally used fentanyl include Apache, China Girl, China White, Dance Fever, Friend, Goodfellas, Jackpot, Murder 8, and Tango & Cash. Synthetic opioids, including fentanyl, are now the most common drugs involved in drug overdose deaths in the United States. In 2017, 59.8 percent of opioid-related deaths involved fentanyl compared to 14.3 percent in 2010." The article goes on to explain how Fentanyl is used and how it affects the brain.

How do people use fentanyl? "6 When prescribed by a doctor, fentanyl can be given as a shot, a patch that is put on a person's skin, or as lozenges that are sucked like cough drops. The illegally used fentanyl most often associated with recent overdoses is made in labs. This synthetic fentanyl is sold illegally as a powder, dropped onto blotter paper, put in eye droppers and nasal sprays, or made into pills that look like other prescription opioids. Some drug dealers are mixing fentanyl with other drugs, such as heroin, cocaine, methamphetamine, and MDMA. This is because it takes very little to produce a high with fentanyl, making it a cheaper option. This is especially risky when people taking drugs don't realize they might contain fentanyl as a cheap but dangerous additive. They might be taking stronger opioids than their bodies are used to and can be more likely to overdose."

How does fentanyl affect the brain? "6 Like heroin, morphine, and other opioid drugs, fentanyl works by binding to the body's opioid receptors, which are found in areas of the brain

that control pain and emotions. After taking opioids many times, the brain adapts to the drug, diminishing its sensitivity, making it hard to feel pleasure from anything besides the drug. When people become addicted, drug seeking and drug use take over their lives. "Fentanyl's effects include: extreme happiness, drowsiness, nausea, confusion, constipation, sedation, problems breathing and unconsciousness. Fentanyl is addictive because of its potency. A person taking prescription fentanyl as instructed by a doctor can experience dependence, which is characterized by withdrawal symptoms when the drug is stopped. A person can be dependent on a substance without being addicted, but dependence can sometimes lead to addiction."

Can you overdose on fentanyl? "6 Yes, a person can overdose on fentanyl. An overdose occurs when a drug produces serious adverse effects and life-threatening symptoms. When people overdose on fentanyl, their breathing can slow or stop. This can decrease the amount of oxygen that reaches the brain, a condition called hypoxia. Hypoxia can lead to a coma and permanent brain damage, and even death."

Heroin is probably the largest issue within the Opioid epidemic, this drug is commonly known around the world, and is said to be one of the most sought after substances by drug dealers. This drug is one that can be found in larger drug cartel stings, and causes hundreds of thousands of overdoses per year.

"Heroin is an opioid drug made from morphine, a natural substance taken from the seed pod of the various opium poppy plants grown in Southeast and Southwest Asia, Mexico, and

Colombia. Heroin can be a white or brown powder, or a black sticky substance known as black tar heroin. Other common names for heroin include big H, horse, hell dust, and smack.

How do people use heroin? People inject, sniff, snort, or smoke heroin. Some people mix heroin with crack cocaine, a practice called speedballing.

What are the effects of heroin? Heroin enters the brain rapidly and binds to opioid receptors on cells located in many areas, especially those involved in feelings of pain and pleasure and in controlling heart rate, sleeping, and breathing.

Prescription Opioids and Heroin; Prescription opioid pain medicines such as OxyContin® and Vicodin® have effects similar to heroin. Research suggests that misuse of these drugs may open the door to heroin use. Data from 2011 showed that an estimated 4 to 6 percent who misuse prescription opioids switch to heroin 1-3 and about 80 percent of people who used heroin first misused prescription opioids.¹⁻³ More recent data suggest that heroin is frequently the first opioid people use. In a study of those entering treatment for opioid use disorder, approximately one-third reported heroin as the first opioid they used regularly to get high. This suggests that prescription opioid misuse is just one factor leading to heroin use. Read more about this intertwined problem in our Prescription Opioids and Heroin Research Report.

Short-Term Effects: People who use heroin report feeling a "rush" (a surge of pleasure, or euphoria). However, there are other common effects, including: dry mouth, warm flushing of

the skin, heavy feeling in the arms and legs, nausea and vomiting, severe itching, clouded mental functioning, going "on the nod," a back-and-forth state of being conscious and subconscious.

Long-Term Effects: People who use heroin over the long term may develop: insomnia, collapsed veins for people who inject the drug, damaged tissue inside the nose for people who sniff or snort it, infection of the heart lining and valves, abscesses (swollen tissue filled with pus), constipation and stomach cramping, liver and kidney disease, lung complications, including pneumonia, mental disorders such as depression and antisocial personality disorder, sexual dysfunction for men, irregular menstrual cycles for women. Other Potential Effects

Heroin often contains additives, such as sugar, starch, or powdered milk, that can clog blood vessels leading to the lungs, liver, kidneys, or brain, causing permanent damage. Also, sharing drug injection equipment and having impaired judgment from drug use can increase the risk of contracting infectious diseases such as HIV and hepatitis (see "Injection Drug Use, HIV, and Hepatitis").

Can a person overdose on heroin? Yes, a person can overdose on heroin. A heroin overdose occurs when a person uses enough of the drug to produce a life-threatening reaction or death. Heroin overdoses have increased in recent years. When people overdose on heroin, their breathing often slows or stops. This can decrease the amount of oxygen that reaches the brain, a condition called hypoxia. Hypoxia can have short- and long-term mental effects and effects on the nervous system, including coma and permanent brain damage.

Is heroin addictive? Heroin is highly addictive. People who regularly use heroin often develop a tolerance, which means that they need higher and/or more frequent doses of the drug to get the desired effects. A substance use disorder (SUD) is when continued use of the drug causes issues, such as health problems and failure to meet responsibilities at work, school, or home. An SUD can range from mild to severe, the most severe form being addiction. Those who are addicted to heroin and stop using the drug abruptly may have severe withdrawal. Withdrawal symptoms—which can begin as early as a few hours after the drug was last taken—include: restlessness, severe muscle and bone pain, sleep problems, diarrhea and vomiting, cold flashes with goose bumps ("cold turkey"), uncontrollable leg movements ("kicking the habit"), severe heroin cravings.

Researchers are studying the long-term effects of opioid addiction on the brain. Studies have shown some loss of the brain's white matter associated with heroin use, which may affect decision-making, behavior control, and responses to stressful situations.^{6–8}

Over all, we have learned that Fentanyl, Heroin and even the up and coming drug Kratom are very dangerous and some highly addictive. We also have learned that there are other potential opioids out there that could become unsuspectingly addictive, but it is time to move onto another portion of the paper. Later on in the paper under treatment options we will cover how being an addict to Fentanyl and Heroin can be treated, and why it is an issue to try to treat these commonly known drugs.

Impact of Society- How this impacts the communities

Opioids are highly dangerous. We have established this information clearly, but how does this crisis affect the society, the communities most known for the crisis, and the people around them? Let us take a look into the demographics of people affected, how it will most likely affect, and where the higher rates occur. An article titled "The Opioid Crisis in Black Communities," written by Keturah James and Ayana Jordan describes the of the racial demographics related to the crisis: *"While much of the social and political attention surrounding the nationwide opioid epidemic has focused on the dramatic increase in overdose deaths among white, middle-class, suburban and rural users, the impact of the epidemic in Black communities has largely been unrecognized. Though rates of opioid use at the national scale are higher for whites than they are for Blacks, rates of increase in opioid deaths have been rising more steeply among Blacks (43%) than whites (22%) over the last five years. Moreover, the rate of opioid overdose deaths among Blacks already exceeds that of whites in several states"*

Media coverage of the epidemic routinely describes it as "The New Face of Drug Addiction," insinuating that this demographic is experiencing addiction at rates never seen before. Dozens of news stories mention that 90% of the 33,091 people who died from opioids in 2015 were white. Doctor prescribing practices have been a focus as well, given that the increased misuse of prescription opioids among whites has led to addiction in some cases, and that overdose deaths involving prescription opioids have quadrupled since 1999. The trend of opioid initiation type may be changing however, with a current study reporting a marked increase in heroin as the modal substance of initiation.

Though it's true that the most dramatic increase in opioid-related deaths has occurred in white Americans, the opioid epidemic has also profoundly affected communities of color. Opioid deaths, in particular heroin overdoses, have nearly doubled among Black Americans since 2000. Since 2000, the rate of overdose deaths involving opioids has nearly quadrupled, resulting in more than 500,000 deaths in under two decades."

According to the University of Toledo *"The opioid epidemic continues to be a serious public health issue affecting every state in the nation. In addition to the toll opioid abuse takes on human life, the crisis is affecting our economic well-being. In metropolitan Toledo — Lucas, Wood, Fulton and Ottawa counties — the number of fatal opioid overdoses has risen from less than two dozen in 2007 to more than 145 annually in each of the last three years. Each of those losses causes significant damage to the regional economy, both directly from lost spending, wages and productivity, and indirectly from lower employment and other trickle-down effects. A 2019 analysis from The University of Toledo puts the total impact of overdose death at \$1.6 billion."*

A question lingering in your mind could possibly be, where are the areas that are mostly affected by the crisis? Although this crisis is nation wide, and it can literally be happening in your own back doors without you being aware of it, let's take a closer look to where it hit the most. From research it shows that the higher death rates are in the states with lower poverty or with more people that are on a Medicare plan, government assistance, or have a set income limit. The answer as to why this type of people are more likely to become an opioid addict is unclear. Could it be that it is easier to prescribe these medications to the poor or poverty communities?

To answer that, we would have to do a sole paper on that topic alone. Kentucky falls into a category where there are higher death rates. If you searched the death rates and locations for the higher places on the CDC website, you will find that most of the United States in the dark red regions, meaning that those states have the highest death rates due to drug overdose, this chart was from 217/2018. They did not have a recent chart for 2020 up until now. See Below for the data

"State Opioid-Involved Overdose Death Rates and Opioid Prescribing Levels

State Opioid-Involved Overdose Deaths/100,000 persons¹

(2018) Opioid Prescriptions/100 persons² (2018)

Data Table

<i>Very High</i>	<i>West Virginia</i>	<i>42.4</i>	<i>69.3</i>	<i>Elevated</i>	<i>Florida</i>	<i>15.8</i>	<i>53.7</i>
<i>Very High</i>	<i>NARYLAN</i>	<i>33.7</i>	<i>45.1</i>	<i>Elevated</i>	<i>Wisconsin</i>	<i>15.3</i>	<i>45.8</i>
<i>Very High</i>	<i>New York</i>	<i>33.1</i>	<i>46.1</i>	<i>Elevated</i>	<i>New York</i>	<i>15.1</i>	<i>34.0</i>

<i>High</i>	<i>Hampshire</i>						
<i>Very High</i>	<i>Ohio</i>	29.6	53.5	<i>Moderate</i>	<i>Utah</i>	14.8	57.1
<i>Very High</i>	<i>Massachusetts</i>	27.5	35.3	<i>Moderate</i>	<i>Virginia</i>	14.3	44.8
<i>High</i>	<i>Connecticut</i>	26.7	43.0	<i>Moderate</i>	<i>Nevada</i>	11.5	55.5
<i>High</i>	<i>Washington D.C</i>	25.9	25.0	<i>Lower</i>	<i>Colorado</i>	9.5	45.1
<i>High</i>	<i>Rhode Island</i>	23.4	43.0	<i>Lower</i>	<i>Washington</i>	9.4	49.3
<i>High</i>	<i>Kentucky</i>	23.4	79.5	<i>Lower</i>	<i>Alaska</i>	8.8	44.9
<i>High</i>	<i>Maine</i>	22.8	41.8	<i>Lower</i>	<i>Georgia</i>	8.3	63.2
<i>High</i>	<i>Vermont</i>	20.8	42.4	<i>Lower</i>	<i>Oregon</i>	8.0	57.3
<i>High</i>	<i>Michigan</i>	19.6	62.7	<i>Lower</i>	<i>Oklahoma</i>	7.8	79.1
<i>High</i>	<i>Tennessee</i>	17.9	81.4	<i>Lower</i>	<i>Wyoming</i>	6.8	57.1

<i>Elevated</i>	<i>Missouri</i>	<i>17.5</i>	<i>63.4</i>	<i>Lower</i>	<i>Minnesota</i>	<i>6.3</i>	<i>35.5</i>
<i>Elevated</i>	<i>North Carolina</i>	<i>17.1</i>	<i>61.5</i>	<i>Lower</i>	<i>Mississippi</i>	<i>6.1</i>	<i>76.8</i>
<i>Elevated</i>	<i>Indiana</i>	<i>17.0</i>	<i>65.8</i>	<i>Lower</i>	<i>California</i>	<i>5.8</i>	<i>35.1</i>
<i>Elevated</i>	<i>South Carolina</i>	<i>16.7</i>	<i>69.2</i>	<i>Lower</i>	<i>Texas</i>	<i>4.8</i>	<i>47.2</i>
<i>Elevated</i>	<i>Illinois</i>	<i>15.9</i>	<i>45.2</i>	<i>Lowest</i>	<i>Iowa</i>	<i>4.8</i>	<i>49.3</i>
<i>Elevated</i>	<i>New Mexico</i>	<i>15.8</i>	<i>49.4</i>	<i>Lowest</i>	<i>Hawaii</i>	<i>4.1</i>	<i>33.4</i>
<i>Elevated</i>	<i>Arizona</i>	<i>15.1</i>	<i>50.7</i>				

***Not included- Did not mention Inclusion Criteria ***

<i>-</i>	<i>Alabama</i>	<i>-</i>	<i>97.5</i>
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-	<i>Arkansas</i>	-	93.5
-	<i>Delaware</i>	-	60.6
-	<i>Idaho</i>	-	61.9
-	<i>Kansas</i>	-	64.3
-	<i>Louisiana</i>	-	74.4
-	<i>Montana</i>	-	54.0
-	<i>Nebraska</i>	-	50.6
-	<i>New Jersey</i>	-	38.9
-	<i>North Dakota</i>	-	37.4
-	<i>Pennsylvania</i>	-	49.9
-	<i>South Dakota</i>	-	42.6

***Opioid overdose deaths are identified using underlying cause-of-death codes X40–X44, X60–X64, X85, and Y10–Y14. Opioid overdose deaths as defined, that have T40.1 (Heroin), T40.2 (Natural and semi-synthetic opioids), T40.3 (Methadone), T40.4 (Other synthetic narcotics), T40.6 (Other and unspecified narcotics) as a contributing cause. Age-adjusted death rates were calculated as deaths per 100,000 population using the direct method and the 2000 standard population. Source: The Centers for Disease Control and Prevention, CDC WONDER.

The original source of the opioid prescribing rates is, IQVIA Xponent 2006–2018. The data source information and description can be accessed from the Centers for Disease Control and Prevention U.S. Opioid Prescribing Rate Maps webpage."

According to CDC.gov when interviewing and speaking with real people about the opioid crisis. They are trying to get insight on who and who this affects and why. Here is a portion of the research they gathered: *"In 2019, CDC captured more real stories to add to the Rx Awareness campaign originally launched in 2017. The new messages and ads focus on recovery. The messages are targeted to audiences that have special considerations, such as pregnant women. The ads and messages also focus on people heavily impacted by the opioid overdose epidemic, including veterans, younger adults (25-to-34-year-olds), older adults (45-to-54-year-olds), and American Indians/Alaska Natives.*

Across this nation, we have seen an alarming rise in drug overdose deaths. Overdose deaths from prescription and illicit opioids were nearly 6 times higher in 2018 than 1999. Personal stories of addiction and recovery can inspire us all and fuel new commitments to helping end this devastating public health crisis. The current COVID-19 pandemic in the United States introduces new risks to Americans impacted by opioid use disorder, as well as a series of new challenges related to treatment and recovery."

So many are probably wondering how the COVID-19 and the Opioid Epidemic are going sort of hand in hand. As mentioned in the beginning of this paper, the COVID-19 epidemic is in a way fueling or giving more rise in the Opioid Crisis. Why is that you may wonder? According to the American Medical Association in an article they posted updated September 8th 2020, this is the insight that they have in regards to the Crisis and the Epidemic. *"As the COVID-19 global*

pandemic continues, so does the nation's opioid epidemic. The AMA is greatly concerned by an increasing number of reports from national, state and local media suggesting increases in opioid-related mortality—particularly from illicitly manufactured fentanyl and fentanyl analogs. More than 40 states have reported increases in opioid-related mortality as well as ongoing concerns for those with a mental illness or substance use disorder in counties and other areas within the state. This also includes new reports about the need for evidence-based harm reduction services, including sterile needle and syringe services and naloxone. The AMA is pleased that the U.S. Substance Abuse and Mental Health Services Administration and U.S. Drug Enforcement Administration (DEA) have provided increased flexibility for providing buprenorphine and methadone to patients with opioid use disorder. The AMA is further pleased at increased flexibility provided by the DEA to help patients with pain obtain necessary medications. The AMA urges governors and state legislatures to take action • Governors must adopt the new SAMHSA and DEA rules and guidance in-full for the duration of the national emergency—this includes flexibility for evaluation and prescribing requirements using telemedicine; • States must enact as part of their own Emergency Orders and other actions a complete removal of prior authorization, step therapy and other administrative barriers for medications used to treat opioid use disorder; • States must remove existing barriers for patients with pain to obtain necessary medications. This includes removing arbitrary dose, quantity and refill restrictions on controlled substances; and • States must enact, implement and support harm reduction strategies, including removing barriers to sterile needle and syringe services programs.”

As we research the crisis, we can't wonder, does addiction affect women and men differently? If so, why would it become an issue for either gender moreover the other? Are

women more susceptible to addiction versus men? I wanted to find out the answer to this question as well, so upon research I found some interesting information on drugabuse.gov. According to Sex and Gender differences in Substance Use, located on the drugabuse.gov's website, this is the information I found;

“Women face unique issues when it comes to substance use, in part influenced by:

- *sex—differences based on biology*
- *gender—differences based on culturally defined roles for men and women*

Scientists who study substance use have discovered that women who use drugs can have issues related to hormones, menstrual cycle, fertility, pregnancy, breastfeeding, and menopause. In addition, women themselves describe unique reasons for using drugs, including controlling weight, fighting exhaustion, coping with pain, and attempts to self-treat mental health problems.

Science has also found that:

19.5 million females (or 15.4 percent) ages 18 or older have used illicit drugs in the past year. I*

**The term "illicit" refers to the use of illegal drugs, including marijuana according to federal law, and misuse of prescription medications.*

- *Women often use substances differently than men, such as using smaller amounts of certain drugs for less time before they become addicted.*
- *Women can respond to substances differently. For example, they may have more drug cravings and may be more likely to relapse after treatment.*

- *Sex hormones can make women more sensitive than men to the effects of some drugs.*
- *Women who use drugs may also experience more physical effects on their heart and blood vessels.*
- *Brain changes in women who use drugs can be different from those in men.*
- *Women may be more likely to go to the emergency room or die from overdose or other effects of certain substances.*
- *Women who are victims of domestic violence are at increased risk of substance use.*
- *Divorce, loss of child custody, or the death of a partner or child can trigger women's substance use or other mental health disorders.*
- *Women who use certain substances may be more likely to have panic attacks, anxiety, or depression.*
- - *Substance use while pregnant and breastfeeding*

8.4 million females (or 6.6 percent) ages 18 and older have misused prescription drugs in the past year.¹

The number of women with opioid use disorder at labor and delivery quadrupled from 1999-2014.³

Substance use during pregnancy can be risky to the woman's health and that of her children in both the short and long term. Most drugs, including opioids and stimulants, could potentially harm an unborn baby. Use of some substances can increase the risk of miscarriage and can cause migraines, seizures, or high blood pressure in the mother, which may affect her fetus. In

addition, the risk of stillbirth is 2 to 3 times greater in women who smoke tobacco or marijuana, take prescription pain relievers, or use illegal drugs during pregnancy.² Surveys suggest that more women are using marijuana during pregnancy, which has health professionals concerned. The American College of Obstetrics and Gynecology (ACOG) suggests that marijuana can result in smaller babies, especially in women who use marijuana frequently in the first and second trimesters. ACOG recommends that pregnant women or women wanting to get pregnant should stop using marijuana, even if it is for medical purposes, and discuss options with their doctors that will be healthier for their babies.⁴ Pregnant women should check with their health care provider before using any medicines or substances.

When a woman uses some drugs regularly during pregnancy, the baby can go through withdrawal after birth, a condition called neonatal abstinence syndrome (NAS). Research has shown that NAS can occur with a pregnant woman's use of opioids, alcohol, caffeine, and some prescription sedatives. The type and severity of a baby's withdrawal symptoms depend on the drug(s) used, how long and how often the mother used, how her body breaks down the drug, and if the baby was born full-term or prematurely.

Symptoms of NAS in a newborn can develop immediately or up to 14 days after birth. Some of these symptoms include:

- *blotchy skin coloring*
- *diarrhea*
- *excessive or high-pitched crying*

- *fever*
- *increased heart rate*
- *irritability*
- *poor feeding*
- *rapid breathing*
- *seizures*
- *sleep problems*
- *slow weight gain*
- *trembling*
- *vomiting*

Also, substance use by the pregnant mother can lead to long-term and even fatal effects, including:

Smoking tobacco during pregnancy is estimated to have caused 1,015 infant deaths per year from 2005 through 2009.5

- *birth defects*
- *low birth weight*
- *premature birth*
- *small head size*
- *sudden infant death syndrome*

Some substances, such as marijuana, alcohol, nicotine, and certain medicines, can be found in breast milk. However, little is known about the long-term effects on a child who is exposed to these substances through the mother's milk. Scientists do know that teens who use drugs while their brains are still developing could be damaging their brain's learning abilities. Therefore, similar risks for brain problems could exist for drug-exposed babies. Given the potential of all drugs to affect a baby's developing brain, women who are breastfeeding should talk with a health care provider about all of their substance use.

Sex and gender differences in substance use disorder treatment

If a pregnant woman attempts to suddenly stop using drugs and alcohol without medical help, she can put her fetus at risk.

It is important to note that treatment for substance use disorders in women may progress differently than for men. Women report using some substances for a shorter period of time when they enter treatment. However, women's substance use tends to progress more quickly from first use to addiction. Withdrawal may also be more intense for women. In some cases, women respond differently than men to certain treatments. For instance, nicotine replacement (patch or gum) does not work as well for women as for men.

It can be hard for any person with a substance use disorder to quit. But women in particular may be afraid to get help during or after pregnancy due to possible legal or social fears and lack of child care while in treatment. Women in treatment often need support for handling the burdens of work, home care, child care, and other family responsibilities.

Specific programs can help pregnant women safely stop drug use and also provide prenatal care. Certain types of treatment have shown positive results, especially if they provide services such as child care, parenting classes, and job training. Medications such as methadone and buprenorphine, combined with the treatments described above, can improve outcomes. Some babies will still need treatment for withdrawal symptoms. However, outcomes are better for the baby if the mother takes treatment medicine during pregnancy than if she continues to use opioids.

For more information about sex and gender issues for women related to substance use, read the Substance Use in Women Research Report.

The importance of including women in research

In the past, women were not included in most research because of the belief that women are more biologically complicated than men and that women were too busy caring for their children to participate in studies. However, excluding specific subgroups from research produces knowledge that only helps a portion of the public. Federal agencies, including the National Institutes of Health (NIH), have been instrumental in pushing for women to be included in clinical research. These efforts have ensured that broader public health issues related to sex and gender are studied.”

So we now have a small insight on how the crisis is affecting society and the world today, but let us take a closer look into how to treat the crisis, maybe some ways to catch on to signs before the addiction becomes life consuming.

Treatment Options

Depending on your location there are actually many treatment options out there. You can easily look to google search engine to begin the steps in the right direction for treatment options. As I am doing my research I noticed in California there is one of the options that I have come across is called the Waismann Method. This method according to opiates.com "*Waismann Method® professionals have spent two decades providing patients the best available treatment for opioid use disorder. Our commitment to excellence is as strong today as it was 21 years ago when it all began.*

We Are the “Only” Providers of the Waismann Method®

Although you might see other websites and treatment centers claiming to perform our method, it is simply not true. We have concentrated all our efforts in one location to give patients the best facilities, most experienced medical professionals, and undeniably, the best drug treatment results. No other treatment center (worldwide) is affiliated with us, nor have they been trained by us.

Our highly respected, quadruple board-certified medical director only works with his team of specialists. Our exclusive location in Southern California combines decades of experience and the highest opioid detox success rate in the U.S. – these are just a few of the factors that make us unique.

Most importantly, we tailor treatment protocols to your medical needs. As a leader in our field, we strive to provide the highest medical care level to ensure your safety and success in completing individualized detox treatment. You do not have to settle for less than the highest level of care or a treatment center with lower standards, and you do not have to try to detox alone. We are here for you every step of the way; from assessing you and your unique health needs, to carefully monitoring you throughout detoxification treatment. All the while, providing a private and safe environment."

Also in California there is also a Medical Detoxification method. According to opoirids.com "*Effective Medical Detox Performed in the Safety of a Private Hospital* Although we take great care to prevent an adverse medical event as responsible medical care providers, we always want to be prepared in case one should arise. In a full-service, JCAHO-accredited hospital in Southern California, our patients have access to many specialized physicians, nurses, and other healthcare professionals to provide any medical care you need without delay. In addition to attention from our dedicated staff at the hospital, you will receive a private room and around-the-clock medical care to keep you on the path to better health.

Our medical staff takes into account many patient factors before beginning opioid detox treatments, such as:

Overall health

Level and length of opiate use and other drugs.

Medical history

Age

Waismann Method® offers rapid detox and other forms of opioid detoxification treatment. If you are not a candidate for or do not want anesthesia-assisted opiate detox, we have other medical detox treatments that might be more appropriate for your specific needs.

Like the rest of the treatment experience at Waismann Method® and our recovery center, Domus Retreat, our staff always respect your privacy. We don't ask you to share rooms or your personal history with strangers. There are no chores, and no requirement to participate in structured group therapy."

When searching the treatment options for Opioids, you literally have the easiest tool at your fingertips. If you can use a smartphone then you can find anything you set your mind to. As I stated prior there are many options just based on your state and the availability They could range from clinics, hospitals, medicinal treatment, rehab centers, and more. There is a beautiful Rehab center located in Texas called The Riverwalk Ranch, they offer medical detox and inpatient service, intensive outpatient partial outpatient and more. They are highly confident in their treatments, just look for yourself...

"TREATMENT THAT IS PROVEN TO WORK

At Riverwalk Ranch, we are committed to creating a safe and positive environment. A place where you can experience a peaceful recovery surrounded by family. Our Dallas Texas rehab facility recognizes drug and alcohol addiction as a chronic disease.

We know that your recovery is dependent upon adopting a new way of life. Here, you'll be provided with an individualized and collaborative treatment plan accompanied by a full continuum of care and support. Our treatments are designed to ensure you have the best

opportunity to heal while you become the most excellent version of yourself.- The RiverWalk Treatment Center"

Battling opioids and their addictions is a very hard process to overcome, but there is more to recovering than just being sober. Once you begin the opioids your normal doses become too low, and you want more, and more before too long you are so far down the addiction rabbit hole, you have lost who you are. You have become unrecognizable to your family and friends, you have lost the majority if not all things that were valuable to you, you are desperate for a "fix." Once you hit this low, you will literally do anything to make yourself feel that high again. This is when the true problems come in, this point of your life.

Say for example you are in need of emergency medical treatment for an overdose, because you have been taking any and everything, the doctors really can't treat you because you have become immune to their treatment options, due to your addiction. Yes this is real this is not something that is just far fetched. There are case studies out there that cover that kind of risk and risk management of a drug addiction. So many drugs are laced with random ingredients off the street now to intensify their high affect, it becomes difficult for doctors to treat the properly without running the risk of counter reactions, not knowing exactly what was in the drug and many more issues, which I will not cover here, that would have to be a whole other paper.

However if you are one of the lucky ones who have a family or you were strong enough to get a handle on your addiction, moderately addicted there is definitely hope for you to recover. Unfortunately, there could be some long term side effects you may have to deal with as a result of being a former addict. According to AmericanAddictionCenters.org, below are some of the long term effects one could face from addiction, for a common addiction- Muscle Relaxers.

"Drug abuse has devastating effects on the mind, behavior, and relationships, but the permanent effects of drugs on the body can slowly destroy vital systems and functions, culminating in permanent disability or even death. Even legal drugs, taken to excess, can cause significant problems that cannot be easily undone; and for some illegal drugs, excessive consumption might not even be necessary for lifelong damage to occur. Drug dependence occurs when the user's brain becomes physically incapable of functioning at an optimal level unless the drugs are present. The use has caused persistent changes that can't be ignored or explained away. A person like this feels a chemical need for drugs, and it's that need that drives continued use, even if the person wants to stop using...Muscle relaxers or muscle relaxants are medications used to treat acute muscle pain and discomfort caused by muscle spasms. Muscle spasms are involuntary contractions that cause excessive strain in muscles and are often associated with conditions such as lower back pain and neck pain.

Medications used as muscle relaxers can differ in their chemical structures and the way they work in the brain. In general, muscle relaxers act as central nervous system depressants and cause a sedative effect or prevent your nerves from sending pain signals to your brain. The onset of action is rapid and effects typically last from 4-6 hours.

Some of the common side effects of muscle relaxers include:

Drowsiness

Dizziness

Agitation

Irritability

Headache

Nervousness

Dry mouth

Decreased blood pressure

The most commonly prescribed muscle relaxers are carisoprodol (Soma) and cyclobenzaprine (Flexeril). According to data from IMS Health, there were 4.2 million prescriptions of Soma and 28.4 million prescriptions of Flexeril dispensed in the United States in 2017.1-2

Muscle Relaxer Abuse

Muscle relaxers have a potential for abuse and addiction. Prolonged use can lead to increased tolerance and physical dependence, especially with Soma.3 For this reason, muscle relaxers are intended as a short-term treatment not to be prescribed for more than 2-3 weeks.

Unfortunately, many individuals take muscle relaxers alone or in combination with other illicit drugs for nonmedical reasons, such as to produce or enhance feelings of euphoria and dissociation. According to the Drug Enforcement Administration, Soma is one of the most commonly diverted drugs in the United States.2 Evidence also indicates prevalent misuse of Flexeril. In 2010 there were over 12,000 emergency room visits associated with Flexeril, and in 2016 over 10,000 calls to the Poison Control Centers had involved Flexeril.1

Muscle relaxer abuse can lead to serious dangers such as an increased risk of overdose, which can result in:

stupor

hallucinations

seizures

shock

respiratory depression

cardiac arrest

coma

death”

According to the National Council on Alcoholism and Drug Dependence, signs of drug dependence include: *“Tolerance: People with this issue must take more and more of a drug in order to feel effects that once came with smaller doses.*

Withdrawal: When people attempt to stop taking the drug, they feel physically or mentally ill.

Loss of control: An inability to control when the use happens or how much a person takes characterizes a loss of control.

Inability to stop use: As much as a person like this might want to quit or cut back, it’s impossible to do so.

Continued use despite negative consequences: Arrests, medical crises, or other terrible life events can’t deter the use.

Intense focus: For someone like this, nothing is as important as the drug. Family, friends, pets, careers, and hobbies all pale in importance.

Drug addiction treatment has the power to help people leave a prescription pill habit behind. Unfortunately, few people in the United States either know about or take advantage of

the help that comes through an addiction treatment center. For example, according to NIDA, about 22.7 million Americans needed help for an addiction issue in 2013, but only 2.5 million people got help in a specialty facility.

People with a prescription drug habit are among the drug users that most often need specialty help. That's because they often need medical detox services. People abusing CNS depressants can experience seizures when they try to quit, while people who use prescription opioids may feel flu-like symptoms when they withdraw. A medical detox program can use medication therapies and alternative medicine techniques to soothe distress, which makes withdrawal both comfortable and safe.

Drug rehab programs for prescription drugs often combine medication therapy with behavioral therapies, per NIDA. That means people who enroll in these programs have the opportunity to work with therapists in order to understand how the issue came about and what might be done to keep it from coming back. Therapy allows people to practice their work, so they can emerge from the programs with skills that are honed and up to the relapse challenges the real world provides.

Relapse is a very real possibility. In a study of the issue, published in the Irish Medical Journal , 91 percent of people with a prescription painkiller addiction treated in a program reported a relapse, most within one week of leaving the program.

Relapse programs can help, as they provide people with knowledge about how the relapse process works. At the end of a program like this, people might know that they'll be

tempted to use it again, and they'll know to access touchup services after that first slip. That arrests the slide, and keeps a slip from blowing up into a full-blown addiction.

Relapse programs can also help people to spot their triggers, so they'll be less likely to put themselves at risk in the future."

Hidden Costs

As with anything in the world that goes on and requires a treatment program, there are always some form of hidden costs or hidden agendas. Same goes with the Opioid crisis as well. There are hidden costs to the treatment and processes that goes into treatment and prevention of Opioid addicts. When you are an addict and you overdose or you need help with overcoming addiction, in order to do so you have to either be taken to the hospital or seek treatment. With this there are many steps that have to take place.

First the treatment center or hospital has to diagnose your condition. Then they have to figure out what type and how much of a drug you have taken. Thirdly they have to come up with a treatment plan, that will not counteract the drug or drugs in your system, and that will bring you off your high, or back to reality. To do this there is a lot of scientific effort put forth and that with anything has costs attached, that you and we do not see.

These are all within the "Bill" of the treatment but they may not be labeled so, and a lot of times the treatment options fall under the hospital or treatment center itself, because most of the time, any addict would not have insurance coverage. Therefore these costs have to be absorbed somewhere for the hospital or treatment center to remain able to take care of their

patients. Upon research of hidden costs, I found a very informative article *“The hidden costs of the opioid crisis and the implications for financial management in the public sector”* By Ropero-Miller Jeri D. a Paul J. Speaker b. In this article there is a lot of great information regarding the hidden costs related to the Opioid Crisis.

“Prior to November 2017, the magnitude of the opioid crisis nationally was estimated to have an annual cost of nearly 0.33% of GDP. However, the release of the Council of Economic Adviser (CEA) White House report [1] on the opioid crisis suggests that prior consideration of expenses severely underestimated the economic costs of the opioid crisis by failing to include the loss in productivity from drug overdose deaths. When corrected for these losses, the annual cost from the opioid crisis leapt nearly 600% to \$504 billion, and that estimated total annual cost exceeds 2% of the nation’s Gross Domestic Product (GDP) [2]. Estimates at the individual state level, some of the “crisis” states (i.e., the states with per capita overdose deaths exceeding 30 per 100,000 population) experience a cost approaching 15% of Gross State Product. The economic effects, as measured through the loss in productivity, dominate the costs in addition to previously measured explicit expenses for healthcare, including substance abuse treatment, and additional expenses for policing, courts, jails, and prisons.

The CEA report offers only a 20,000-foot view of the societal costs from opioid abuse. The costs of medical care, substance abuse treatment, and workplace productivity are based upon detailed studies with well-defended estimation procedures. The estimated cost for the criminal justice system includes an estimated cost of roughly \$8 Billion [2]. However, the foundations for the criminal justice system costs are back-of-the-envelope, rough approximations of system-wide costs; they offer little advice at the jurisdictional level to manage scarce resources dealing with

the crisis. Further, they provide a static view of the crisis, ignoring the dynamic growing severity of the problem.

Although the costs included in the CEA report of \$504 billion are a rough estimate of the annual cost, the justice system portion is barely over 1.5% of the total and does not receive much detail in the report [1]. In the present study, we provide a more detailed examination for one aspect of the justice system effects, the forensic science analysis, detailing the direct costs and the opportunity costs elsewhere for resources diverted to the opioid crisis. Using data from the Census of Publicly Funded Forensic Crime Laboratories (hereafter, CENSUS) [3] and data from project FORESIGHT [4], we are able to provide more detail on the impact of the opioid crisis in the running of forensic laboratories. The intent is to provide policymakers with a broader view of the societal costs as decision-makers attempt to battle this crisis.

Although the costs to the justice system of \$8 billion per year are small relative to the total annual cost, the detailed costs experienced by the various parts of the justice system are significant to police, laboratories, courts, jails, and prisons. We highlight the effects experienced by one aspect of the justice system, forensic crime laboratories. For the 2016 year highlighted in the CEA report, data on forensic crime laboratories suggests that the opioid epidemic added over \$270 million in expenses to these laboratories. However, laboratory budgets did not grow at a rate capable of meeting this increased demand for forensic science services. The hidden costs of the opioid crisis borne by the forensic crime laboratories comes in the form of an opportunity cost; namely, funds are extracted from other activities in the laboratory to meet the increased demands for services in drug chemistry and toxicology. Dramatic increases in turnaround times across other areas of investigation continue to grow as the crisis accelerates.

Over the period from 2014 through 2017, the number of states¹ experiencing drug deaths at a rate of thirty or more per hundred thousand population has grown from a single state (WV) to thirteen states (WV, OH, PA, DC, KY, DE, NH, MD, ME, MA, RI, CT, and NJ). These thirteen entities are termed the “crisis states” in the discussion to follow. We compare the crisis states to the other U.S. states to observe the impact of the opioid crisis on the performance of forensic crime laboratories. Recent trends demonstrate that the abuse of synthetic opioids is responsible for the most recent growth trend in drug overdose deaths. We expected to find that the average cost of processing forensic cases for drugs-controlled substances and toxicology would be rising in the crisis states as synthetic opioid use rose. However, we find that these average costs have been falling, likely due to economies of scale.

Although average costs declined for a period of time, total expenses for casework involving drugs-controlled substances and toxicology are growing for these crisis states. The growth rate of expenses in these areas is far outpacing the growth in budgets for the forensic laboratories. To meet this growing demand for casework in drugs-controlled substances and toxicology, laboratories appear to be shifting funds from other areas of investigation to meet expenses in these crisis areas of investigation. The result has been rapid growth in turnaround times in all areas of the laboratory and a dramatic increase in the percentage of casework in backlogs, thus delaying the administration of justice for drug-related and non-drug-related casework. In the words of William Gladstone, “justice delayed is justice denied.”

“The paper is organized as follows. The next section summarizes the CEA White House report, “The Underestimated Cost of the Opioid Crisis,” and the research support upon which the report is based, including the apportionment approach which forms the foundation for the costs to the justice system. The inherent assumptions, behind the allocation of justice system

expenditures, do not jibe with experience; however existing research within the justice sector can overcome these deficiencies. Following discussion of the CEA report, we provide an overview of data available to estimate costs of forensic laboratories in the justice system. The section that follows provides a brief overview of relevant work in criminal justice support systems and the cost structure, economies of scale, and other items relevant for analysis of the expected costs in updating the apportionment estimations. We show that the broad system-wide estimates may be disaggregated to the jurisdictional level to better address local and national policy. The next section provides a view of time trends nationwide in comparison to the rising costs experienced in jurisdictions most severely impacted by the opioid crisis. While the CEA report details a single year, the Council of Economic Advisers analysis takes a static view of this dynamic, growing problem. The resources required to address the opioid crisis must be aimed at a moving target, rather than a focus in the rearview mirror. That dynamic target can be estimated. The final section offers some policy implications and concluding comments.” The article then goes on to say the following:

“1. The White House council of Economic Advisers report

The White House CEA report on the opioid crisis focused on the level of the crisis for the year 2015, the most recent year for which sufficient data was available. The study estimated the costs from a variety of considerations including health care, addiction treatment, the justice system from investigation to incarceration, lost productivity for users—all factors considered in prior studies—and added costs from fatalities, which were not included in prior cost analyses. With these considerations and expansion to account for underreporting of opioid deaths, an estimated one-year cost of \$504 billion resulted. This staggering cost for a single year represents a nearly 600% increase over prior estimates of the annual cost to society from opioid abuse.

The CEA report makes a key contribution to an understanding of the magnitude of the problem through a consideration of the societal costs from overdose deaths attributable to opioids. Using established methodologies for estimating the value of a statistical life and adjusting for the age profile of opioid overdose deaths, the cost estimates range from a low of \$221.6 billion to a high of \$549.8 billion under alternative assumptions. Among the assumptions reviewed, the report argues for an age-dependent profile, which estimates the overdose death costs to be \$431.7 billion.

While the report details the fatality-related cost estimations, it merely borrows prior cost estimates for the associated costs for medical expenses, addiction treatment, lost productivity of abusers, and costs to the justice system for dealing with opioid abuse. Likewise, Florence, et al. borrow the estimate from an earlier study by Birnbaum et al., which categorizes the methodology used to construct the estimated costs as the quantity method and the apportionment method. Healthcare, workplace, and criminal justice estimates were calculated using one of these methods or a combination of the two back-of-the-envelope methods. Inherent in the use of either method is the adoption of the assumptions regarding the underlying data. However, it is not apparent that Florence et al. or The Council of Economic Advisers evaluated the validity of the underlying assumptions.

Consider the apportionment method, “which begins with overall costs of drug abuse per component and apportions the share associated with prescription opioid abuse based on relative prevalence of prescription opioid to overall drug abuse” The apportionment process may sound reasonable on the surface, but the calculation of the overall costs to be apportioned is suspect. To arrive at the overall costs of drug abuse, total criminal justice expenditures are multiplied by

the percentage of drug abuse cases. Not stated is an inherent assumption that all types of cases, drug-related and non-drug-related require the same average expenditure. Disaggregated data indicates otherwise. The problem is compounded in Florence et al. and subsequently in The Council of Economic Advisers report. “We followed an apportionment approach previously described by Birnbaum et al. to update criminal justice costs... using reported criminal justice spending for drug crimes and multiplying that number by the share of drug abuse and dependence cases represented by prescription opioids”.

In the next section, we demonstrate some of the detailed knowledge regarding the cost structure for forensic laboratories. While this demonstration only addresses a portion of the justice system, it highlights the gains to the overall understanding of the societal costs of the opioid crisis to policymakers, and lends support to the allocation of resources to combat the crisis. Researchers in other justice sectors may use their expertise to highlight similar sector effects as a contribution to this overall understanding of the magnitude of the crisis.

2. The business of forensics

Detailed examination of forensic science laboratories as an “industry” is a relatively recent phenomenon. Four laboratories from European Union nations initiated a study, Project QUADRUPOLE, which examined the relationship between laboratory casework and budget allocations [9]. QUADRUPOL offered some insight into the productivity of forensic laboratories through a one-year examination of four national laboratories and provided some of the earliest performance metrics by which other laboratories might gauge their own performance. In 2009, the National Institute of Justice funded a similar study for laboratories in North America called Project FORESIGHT [4]. Project FORESIGHT, however, was not limited to a single year’s

view; rather it has continued to this day and offers a rich set of panel data from which to examine the forensic science laboratory portion of the justice system. Additional data is available through the Department of Justice's periodic census of publicly funded crime laboratories [10].

Examination of any public sector service is often made difficult because of inconsistencies with the data. Those inconsistencies arise from fiscal year differences, jurisdictional idiosyncrasies, wide ranging language and definitions of services, and a general lack of centralization in the data collection. The QUADRUPOLE study offered a unified language for crime laboratory services and offered a detailed breakdown of expenditures across areas of investigation within laboratories.

The FORESIGHT study adopted the standards of QUADRUPOLE with respect to definitions for data collection from casework, personnel, and budgets. Further, FORESIGHT collects the data annually with data submissions from the 2005–2006 fiscal year to the present. FORESIGHT offers a sample of laboratories that has been growing in size to the most recent submission of 163 laboratories for the 2017–2018 period. Laboratory service areas are divided into nineteen analytical services (Blood & Breath Alcohol; Crime Scene Investigation; Digital Evidence—computer, audio, & video; DNA Casework; DNA Database; Document Examination; Drugs—Controlled Substances; Evidence Screening & Processing; Explosives; Fingerprints; Fire Analysis; Firearms & Ballistics; Forensic Pathology; Gunshot Residue; Marks & Impressions; Serology/Biology; Toxicology ante mortem; Toxicology post mortem; and Trace Evidence). Within each analytical service casework detail is collected on the number of cases submitted, items submitted, items outsourced and items examined internally, number of samples examined

internally, number of tests on those samples, and number of reports written. Additionally, two metrics are collected on turnaround time for cases and unprocessed cases, including a categorization for those unprocessed cases that are more than thirty days old (backlog).

FORESIGHT also collects budget and personnel data. On the personal side, the number of full-time equivalent employees (FTE) is collected for both analytical staff and support staff and the allocation of time to casework investigation versus non-casework activity is registered.

Expenditures are detailed for capital, labor, consumables, and other costs to break down a full description of the cost structure by investigative area. Included in the expenditure data are the direct expenditures of the laboratory and any indirect costs that are borne by the parent agency.

The CENSUS collects data on requests for services by investigative area, backlog, and limited budget information for the years 2002, 2005, 2009, and 2014. Budget totals are provided at an aggregated level for the entire laboratory, but not the allocation across analytical areas.

Personnel allocations are limited to the number of full-time and part-time employees, but not the allocation across analytical areas, nor a translation of part-time personnel to a full time equivalent. Much of the casework detail is consistent with the detail in FORESIGHT from requests in an analytical area to completions and the number of cases unprocessed and the number outstanding for more than thirty days. The categories for analytical processes is more compressed than FORESIGHT to include Biological Services, Controlled Substances, Crime Scene Investigation, Digital Media, Firearms, Impressions, Latents, Questioned Documents, Toxicology, and Trace Evidence.

The CENSUS has an advantage with responses from 360 of the 409 publicly funded forensic crime laboratories in the United States, while FORESIGHT relies upon voluntary participation

with 163 submissions in the most recent year and 139 submissions in the 2015–2016 period.² To assess the impact from the opioid crisis on this portion of the justice system, details from the CENSUS on the volume of activity across analytical areas is applied to lessons from analysis of FORESIGHT data to provide a jurisdictionally-based measure of the costs from the crisis.

3. Observations from project FORESIGHT

The CEA report allocated justice system expenditures equally across all types of criminal investigation and prosecution and allocated total expenditures by the percentage of drug-related crime. While that may have been a reasonable assertion for a national view from a broad perspective, analysis of the FORESIGHT data has shown that the costs differ widely across analytical processes. Consider the data in [Table 1](#) from project FORESIGHT [11]. [Table 1](#) presents summary statistics from the laboratories that submitted data to project FORESIGHT for the 2015–2016 period (i.e., the period corresponding to the CEA report [1]). Note that each political jurisdiction mandates its own fiscal year and the resulting FORESIGHT data set has overlapping time periods. The fiscal years for the included laboratories range from the 2015 calendar year to the 2016 Federal fiscal year, October 1, 2015 through September 30, 2016. All laboratory time periods include December 31, 2015 as the minimum overlap period with the rest of the data submissions. The largest number of laboratories follow a July 1, 2015 through June 30, 2016 fiscal year. The cost allocation includes all personnel costs (wage, salary, overtime, and benefits), a five-year moving average for capital, consumables (chemicals, reagents, gasses, and other consumables), and other costs (e.g., overhead). If a forensic science laboratory is not charged for essential functions (e.g., telecommunications, utilities) then a cost allocation is assigned using the sample average cost per FTE times the number of FTE in each investigative area.

Table 1. Cost per case by investigative area.

<i>Area of Investigation</i>	<i>25th percentile</i>	<i>Median</i>	<i>75th percentile</i>
<i>Blood Alcohol</i>	\$90	\$123	\$230
<i>Crime Scene Investigation</i>	\$792	\$3,984	\$6,765
<i>Digital evidence - Audio & Video</i>	\$1,567	\$3,188	\$5,851
<i>DNA Casework</i>	\$943	\$1,335	\$1,926

<i>DNA Database</i>	\$59	\$74	\$166
<i>Document Examination</i>	\$2,213	\$3,451	\$6,441
<i>Drugs - Controlled Substances</i>	\$226	\$313	\$424
<i>Evidence Screening & Processing</i>	\$485	\$1,178	\$1,777
<i>Explosives</i>	\$6,489	\$11,940	\$20,550
<i>Fingerprints</i>	\$490	\$692	\$975

<i>Fire analysis</i>	\$1,054	\$1,853	\$2,905
<i>Firearms and Ballistics</i>	\$920	\$1,755	\$3,066
<i>Forensic Pathology</i>	\$1,602	\$2,010	\$3,053
<i>Gunshot Residue (GSR)</i>	\$1,560	\$2,307	\$3,628
<i>Marks and Impressions</i>	\$2,751	\$6,243	\$8,907
<i>Serology/Biology</i>	\$810	\$1,479	\$2,315

<i>Toxicology ante mortem (excluding BAC)</i>	\$465	\$571	\$825
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<i>Toxicology post mortem (excluding BAC)</i>	\$514	\$678	\$933
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<i>Trace Evidence</i>	\$2,802	\$3,637	\$5,836
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Table 1 highlights the wide range in cost per case both within and across the various areas of investigation. The apportionment method employed in the CEA report does not distinguish these differences. The CEA report treats all forensic crime laboratory analysis from a macro viewpoint and apportions an equal cost foundation to all activity.”

As you can see from a long section of the article above, there are actually a lot of costs that go into the treatment and prevention, programs etc., for the opioid crisis. That topic alone could produce an entire other paper for the subject. Although most people do not see nor do they care about the costs of their addictions, any time someone comes in with addiction issues, or dies

at the rate of the overdose from opioids you can see above there are always heavy costs attached. It will always fall into the hospital's debt or the costs of the government.

Lessons Learned/Conclusion

Throughout the research of this paper I have learned that the opido addiction is constantly on the rise. Without the proper treatment, awareness, and family resources, sadly there will always be the ongoing issue. Most doctors today will not prescribe a painkiller or any type of narcotic as soon as you're out of surgery, had a minor procedure, and anything of the like. They don't do this to be mean or heartless, they do this out of the awareness that it is a highly addictive substance, and you can develop a dependency to it. Once that dependency begins and your prescription is no longer able to be filled, you're hooked. Then what are you going to do? Find some way to fuel your addiction, and that is where it begins.

Years ago when the new hype of opioids and narcotics became the new thing, I wonder if anyone ever thought then that they would become such an issue. Something that people are so easily addicted to due to the effects they can have on one's mental state, and the sensations they receive from the pain or issues just going away. One can't help to wonder if the scientist that produced them knew what they were doing. This is an issue that dates all the way back to Sigmond Freud who had a heroin addiction, so one thing is for sure, this issue may get a slight cap on it, but it will not competently go away.

The government is going to have to come up with a way to control the issue, how or when that is the question, but as long as the opioids are out there, there is going to be some kind of addictions to them. Until we can take the drugs off the streets and out of the communities young and old people will have their dependency on them.

The older generations may truly need them for their health issues, or they may just have that dependency to them. While growing up doctor visits was not a common thing, you did not go to the doctor unless you were practically dying. Why? The location that I grew up in was not considered a poverty town, there were just a lot of older generations who were not used to having insurance and could not really afford to run to the doctor over ever ache or pain. They would come up with self treatment remedies, and so on. So if you went to the doctor, then you must really be sick. Upon going, you would hear “If they put me on some kind of pain medication, I won't take it, that stuff is habit forming”

Now fast forward to today 2020, most of the time you see people always going to the doctors or pain clinics to get help over the smallest things. Insurance coverage is better nowadays, and the economy is becoming better, jobs are out there and people are starting to get in situations they feel stable, but with all that they run to the doctors and then bam that's when it starts. Doctors, nurses, and all medical personnel are very essential in today's society with the ever changing technology, tactics, and so on, they are highly sought after and very needed. Anyone who can step into their role is highly commended, however the prescribing opioids can be reduced, and not turned to as such a quick fix. Maybe if that can be done less and bring in some natural remedies, old school fixes if you will, then maybe just maybe there can be some control over the ongoing epidemic.

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