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An Interstate Analysis of the Opioid Epidemic: Understanding Best Practices, Strategies, and Policy Responses to Address the Opioid Crisis on a National Scale

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An Interstate Analysis of the Opioid Epidemic: Understanding Best Practices, Strategies, and Policy Responses to Address the Opioid Crisis on a National Scale

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ABSTRACT

While most research involves the individual relationship in the opioid crisis, this paper examines the multi-faceted nature of the opioid epidemic. It argues that comprehensive policies are imperative, specifically ones that target systematic drivers of the issue. This includes pivotal areas such as employment, investing in poverty-stricken communities, housing, comprehensive mental health services, and changes to prescription distribution practices. This paper begins with an analysis of the neurobiology of addiction and highlights the historical context of the opioid crisis. The socio-ecological framework of the opioid crisis is discussed at great length and provides the guiding lens for the research conducted in the paper. Through an analysis of data collected from diverse sources such as academic literature, government reports, and key stakeholders, this research paper analyzes the policy approaches of four states: West Virginia, Tennessee, South Dakota, and Nebraska. Given their disparate levels of overdose mortality rates, the study discusses each state's successes and limitations. Ultimately, this paper provides valuable insights to aid policymakers, community stakeholders, and healthcare professionals in mitigating the impact of the opioid crisis. Moreover, it provides an ideological framework for creating sustainable and effective change.

KEYWORDS

Opioid Crisis

Opioid

Addiction

Pharmaceutical Industry

Socio-ecological Framework

Medicated Assisted Treatment

Prescription Drug Monitoring Program (PDMP)

Overdose Mortality

Naloxone

Policy Analysis

Restorative Justice

Introduction

The opioid epidemic is a nationwide public health issue that continues to worsen with time (Seth, Scholl, Rudd, et al., 2018). In 2020, there was an estimated 2.7 million people ages 12 or older in the United States, who had an opioid use disorder – including 2.3 million people who had a substance abuse disorder that started from prescribed pain medications (National Institute on Drug Abuse). Since 2017 when the U.S. Department of Health and Human Services first declared it a public health emergency, deaths involving illicit drugs and prescriptions has only increased (Mineo, 2023). According to the Harvard Gazette, "The number of reported overdose deaths hit 68,000 in 2020 and rose to more than 80,000 by 2021" (Mineo, 2023). This marked increase in opioid-related casualties can be attributed to many interconnected components. Facets of the increase in opioid related casualties range from an increase in polysubstance use, an increase in fentanyl infused drugs and a lack of efficient government legislation to only highlight a few. This paper will discuss what has exacerbated this opioid crisis, study its progression through history and discuss solutions from a legislative and policy-centered perspective. Ultimately, this paper aims to propose positive societal change and actionable policy recommendations that will promote sustainable reform on a national scale.

An opioid is a natural, semi-synthetic, or synthetic chemical that interacts with the opioid receptors in the body and brain to reduce the perception of pain (American Psychiatric Association). Although the terms opioid and opiate are used interchangeably, an opiate refers to naturally found compounds that are derived from the poppy plant, such as heroin or morphine, while opioids could be natural or derived from a lab (American Psychiatric Association). Opiates

more commonly refer to natural opioids such as heroin, morphine and codeine, whereas opioids refer to all natural, semisynthetic, and synthetic opioids (Centers for Disease Control and Prevention).

Neurobiology of Addiction

Opioid tolerance, dependence, and addiction are all manifestations of brain changes that result in the use of chronic opioid abuse (Kosten & George, 2002). The neurobiology of opioid addiction is complex, but it furthers the understanding that addiction, tolerance, and dependence result in changes to the biological and chemical processes of the brain. Understanding the chemical rewiring of the brain that results from dependence and addiction provides the framework for positive change. Cognizing addiction and dependence as a disease with a neurobiological basis can shift the societal perception of addiction and provide better insight toward treatment on an individual and national scale. Furthermore, analyzing addiction from a neurological framework shifts the perception from the criminalization of the individual to understanding effective methods toward treatment, recovery and reform on a legislative level.

When opioids such as heroin, oxycodone, or any form of an opiate travels in the bloodstream, the chemicals attach to proteins on the surface of the brain cells of opiate-sensitive neurons (Kosten & George, 2002). The relationship and linkages between enzymes and receptors activate the release of dopamine, a biochemical brain process that releases feelings of pleasure which are also released during activities like eating and sex (Kosten & George, 2002). Through the release of the dopamine chemical in the brain, the perception of pain is significantly reduced for the patient (Kosten & George, 2002). When taken in a controlled state as a prescription, opioids offer relief to some of the most chronic physical pains. However, this release of pleasure

and activation in the reward system is what triggers the initial stages of abuse and is what causes individuals to repeatedly take the drug outside of its intended purpose. At a certain point, the driving factor for taking the opioid extends far beyond the desire for pleasure and it is then that tolerance and dependence on the opioid occur (Kosten & George, 2002). The more frequently an opioid is taken, the more the body adapts to the repeated use of the drug over time, and this is where tolerance is built. Tolerance is defined as, “the need to take higher and higher dosages of drugs to achieve the same opioid effect” (Kosten & George, 2002). Tolerance and the other biological processes highlighted are examples of the long-lasting chemically induced changes to the brain.

With the repeated use of opioids to induce such feelings, comes the neurobiological process of drug dependency. Drug dependency is when there is daily and repeated use of opioids to appease the distressing symptoms of withdrawal for the individual (Kosten & George, 2002)

Opioid withdrawal results from the dependence of the opioid and is a life-threatening condition (Shah & Huecker 2023). This cycle of needing more to avert the symptoms of withdrawal is where the addiction occurs (National Library of Medicine). An individual who becomes addicted to opioids shifts the totality of their existence toward the prioritization of obtaining and using the drugs (National Library of Medicine). This is where severe negative implications occur to the social, financial, and health-related aspects of an individual's life.

The implications of drug abuse and addiction extend beyond the social and economic dynamics for an individual. The effects of repeated drug use are incapacitating and if proper treatment is not acquired, it is ultimately fatal. Figure 1. demonstrates a national increase in drug-involved overdose deaths between the years of 1999 and 2021.

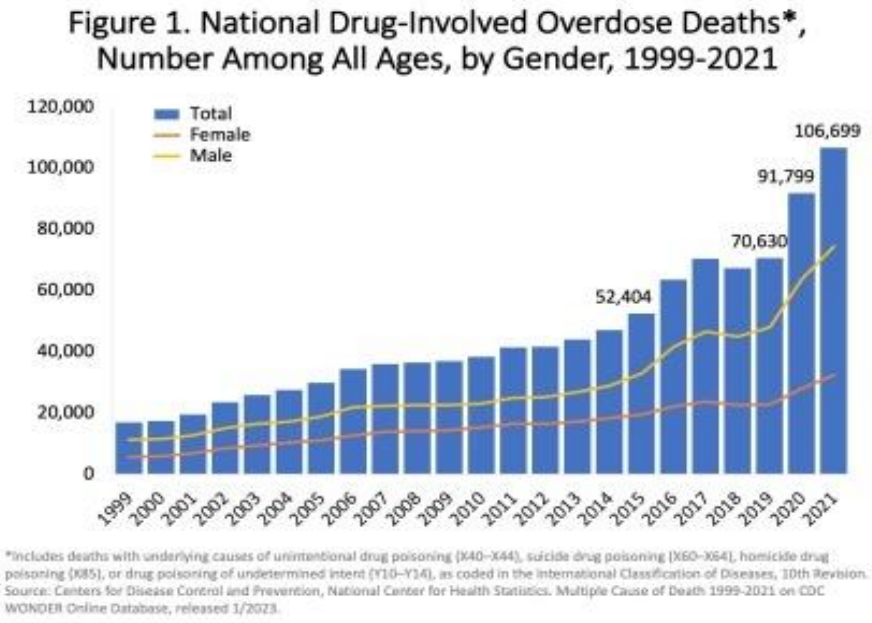


Figure 1 (National Institute on Drug Abuse 2023)

Figure 1 goes on to highlight how, "More than 106,000 persons in the U.S. died from drug-involved overdose in 2021, including illicit drugs and prescription opioids" (National Institute on Drug Abuse 2023). The figure also demonstrates the number of deaths by gender and depicts how men are more likely to die from an overdose death than women, while both genders exhibit an upward trajectory. These numbers depict trends that are only increasing with time and with that, it is important to discuss the historical context as to how the opioid crisis has progressed in society.

Historical Context

The opioid epidemic has emerged because of an interconnected myriad of factors and has a complex history involving the involvement of multiple industries. According to the Centers for Disease Control and Prevention, the epidemic can be analyzed as occurring in three waves

throughout history, with each wave cresting upon the one before. The first wave of the epidemic began in the 1990s due to the increased prescribing of opioids (Centers for Disease Control and Prevention, 2023). Purdue Pharma, a privately held United States Pharmaceutical company, is attributed to as being one of the biggest influences during the first wave of the epidemic. Purdue Pharma introduced OxyContin in 1996 and adopted aggressive promotion tactics centered around the claim that, "the risk of addiction was less than one percent" (Zee 2009). One of their most infamous promotion tactics to increase the sales of Oxycontin involves a lucrative bonus system encouraging sales representatives to increase the sales of OxyContin within their territories (Zee 2009). Increasing the sale and distribution of Oxycontin within their territories meant that it increased the rates in which physicians and primary care physicians would prescribe the drug. Purdue promoted a more liberal use of opioids, and because of this, primary care physicians began prescribing OxyContin at alarmingly high rates (Zee 2009). Furthermore, Purdue implemented a patient starter program that gave patients, "a free limited-time prescription for a 7-30-day supply", and by the time the program ended in 2001 an estimated 34,000 coupons had already been redeemed (Zee 2009). Within this first wave, Oxycontin sales grew from $48 million in 1996 to nearly $1.1 billion in 2000 (Zee 2009).

The next wave of the opioid epidemic began around 2010, and the drug shifts from prescription opioids to heroin. This shift resulted in the rapid increase of heroin-involved deaths. According to Ciccarone (2019), "Young and new heroin users have described transitioning to heroin from opioid pills as their growing dependence required larger and more consistent pill supplies than they could obtain either by prescription or on the street" (Ciccarone 2019). A large part of this shift is attributed to the reformulation of OxyContin to what was supposed to be a more abuse-resistant pill (Glickman 2019). OxyContin was reformulated with a polyethylenoxide matrix that hardened the tablets to limit its usage as an injectable solution (Pain

2022). This reformulation of OxyContin led to the large-scale national shift of prescription opioid abuse to illegally produced and more potent forms of opioids such as heroin and fentanyl (Glickman 2019). In fact, in part of the Plea Agreement between the U.S. Department of Justice and Purdue Pharma, Purdue Pharma acknowledged that due to this reformulation, "some individuals who abused OxyContin moved to more easily manipulated opioids" (U.S. Department of Justice, 2020, p. 8).

The third wave of the epidemic is often attributed to as the result in a rise in synthetic opioids (Centers for Disease Control and Prevention, 2023). This third wave began around 2013 and is accompanied by a great increase in overdose deaths, typically involving illicitly manufactured fentanyl (Centers for Disease Control and Prevention, 2023). The third wave is a result of the rise in production, distribution and consumption of synthetic opioids. The demand for illicitly manufactured fentanyl continues to rise and it is often found in combination with heroin, counterfeit pills, and cocaine. (Centers for Disease Control and Prevention, 2023). According to one study, simply coming to into contact with 2 milligrams can be lethal, and "even police officers and first responders are endangered by accidentally coming into physical contact with or inhaling fentanyl" (Stein & Boyle, 2017, p.18). Due to its high potency, it has been one of the greatest drivers of fatal overdoses, and it is a main contributor in the recent wave of overdose deaths.

Understanding the epidemic's historical background provides a more thorough understanding of how it has progressed in three waves, with each historical period increasing in fatality rates over time. Along with this it is paramount to highlight how different demographic groups have been impacted in different ways throughout history. For example, one study found that non-Hispanic White people had the highest opiate-involved death rates during the first wave (Duchovny et al., 2022). This flipped during the third wave of the epidemic, however, when the

death rates among non-Hispanic Black and Native American or Alaska Native people eventually, "caught up to and then surpassed the death rate among non-Hispanic White people in 2020" (Duchovny et al., 2022, p. 2). The discussion of how different social and ethnic groups are affected by the crisis is fundamental to understanding how the crisis affects individuals differently based on a myriad of different social and environmental factors. This will be discussed at greater lengths throughout the paper.

The pattern and progression of these distinct, yet interconnected waves of the opioid epidemic demonstrate how each wave has impacted and built upon the other. Moreover, it demonstrates the different factors, stakeholders, and agencies that have played a role in how the epidemic has progressed. While looking at the different agencies and stakeholders that have contributed to this crisis, it is imperative to look at the individual level and analyze what societal and root causes may influence a person's substance usage. Understanding the individual, interpersonal and societal factors that may contribute to substance abuse helps further understand the root causes of addiction, which can aid in the suggestion and implementation of policy and legislation.

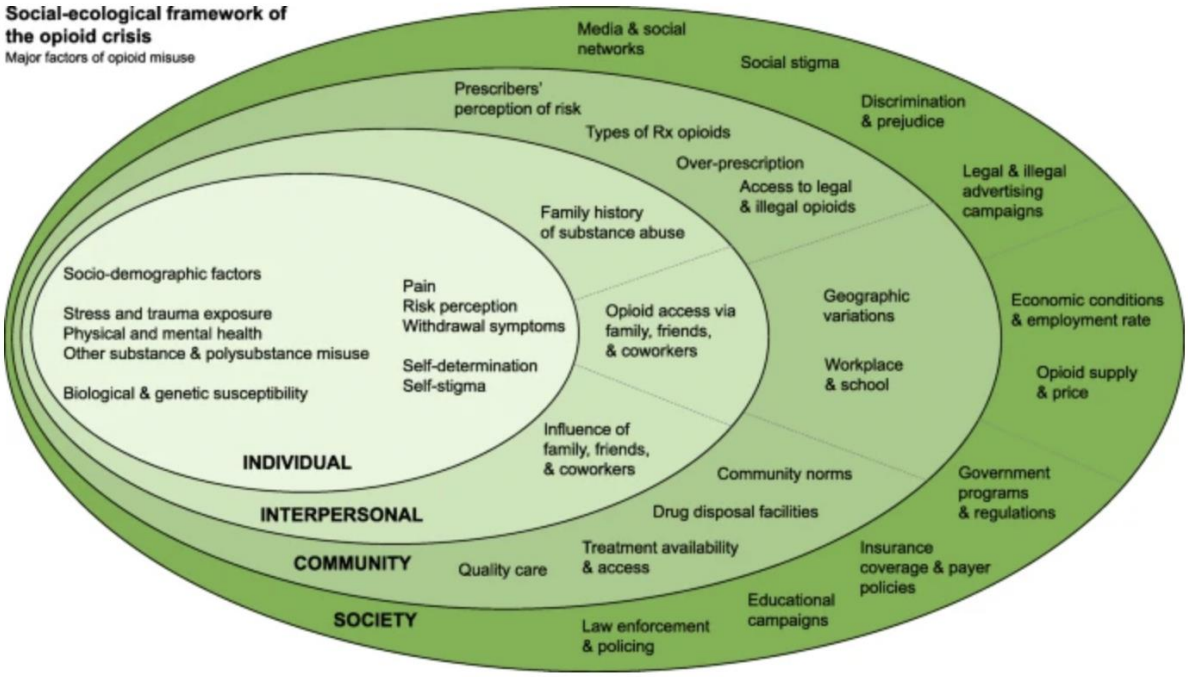
Social Determinants of Substance Abuse

While statistics demonstrate that there is a clear crisis occurring with substance abuse and opioids, it is imperative to recall that these statistics are far more than numbers. Each statistic demonstrates a life lost, a family that is deeply affected and a society that continues to experience the effects at social and economic level of a worsening public health crisis. There are various factors, both societal and interpersonal, that must be acknowledged to understand the epidemic better. Understanding the social determinants of addiction allows for a better

understanding of the underlying factors that contribute to addiction and substance abuse. The following are a few key reasons why it is imperative to analyze the social detriments of addiction. First, a thorough understanding of the social detriments of addiction allows policymakers and legislators to implement sustainable and effective policies that address root causes. Second, it shifts the perspective and stigma surrounding addiction. Understanding addiction as a culmination of external factors and broader societal implications shifts the perspective against the criminalization of the individual. Lastly, understanding addiction as an interconnected phenomenon with interpersonal and societal factors allows for both independent treatment and policy at a larger scale to be directed toward specific needs that target the root issues of the dilemma. In turn, creating more sustainable and effective policy solutions.

When analyzing the social detriments and substance abuse, it is imperative to do so through the lens of a social-ecological model. The social-ecological model analyzes the issue through the perspective of the following social and physical environments: individual, interpersonal, community, and societal (Jalali, Botticelli, et al., 2020). This framework highlights the complexity of the issue and demonstrates how each of the social and physical environments contributes in their own way to the opioid epidemic at the micro and macro levels. Figure one below outlines the major factors of the opioid crisis and aids in further conceptualizing the social-ecological framework.

Fig. 1



Social-ecological framework of the opioid crisis. Socio-demographic factors consist of age, race, gender, ethnicity, education, income and unemployment factors

Figure 2 (Jalali, Botticelli, et al., 2020)

Social-ecological Framework: Individual-level

Individual-level factors in substance abuse and opioid misuse range from sociodemographic, health and mental health, biological, and psychosocial factors (Jalali, Botticelli, et al., 2020). In the study conducted by Jalali & Botticelli et al. (2020), they found that the following are among the most at-risk populations: (Section 2)

> "Opioid misuse peaks in early adulthood (approximately 18-25 years). Early initiation of opioid misuse is a significant risk factor for the development of opioid use disorder and,

> thus, adolescence and young adulthood are key risk periods for opioid misuse. For example, women are more likely than men to receive an opioid prescription and sex differences in the pharmacological effects of opioids have been demonstrated."

Among these sociodemographic populations, the study also highlights the role of race within the opioid epidemic. The role of race within the opioid epidemic is complex both historically and within the current landscape. However, understanding the role of race in the opioid epidemic is crucial for better understanding prescription patterns, health disparities, and it is one of the clearest examples of how social and economic factors greatly influence the susceptibility to opioid misuse.

The study conducted by Jalali & Botticelli et al., discusses how individuals who identify as non-Hispanic white are more likely to receive an opioid prescription, therefore, increasing the risk of exposure to misuse and addiction through this avenue (Jalali, Botticelli, et al., 2020). This discrepancy regarding who is more likely to receive an opioid prescription could be connected to a multitude of factors. However, research has demonstrated that Black/African Americans were 29% less likely to be prescribed opioids for pain (Bechtler, Breland-Noble, et al. 2020, p. 7). One explanation for this is that studies have found that racial and ethnic minorities are more likely to experience miscommunication and misinterpretation when it comes to their perceived level of pain with their medical providers (Bechteler, Breland-Noble, et al. 2020, p. 7). Despite the rate of opioid misuse being historically higher for the non-Hispanic white population, it is important to highlight how the rates of opioid use disorder and overdose deaths for minorities and people of color are rapidly increasing (Jalali, Botticelli, et al., 2020). In 2021 the CDC portrayed in a study that American Indian and Alaska Native people suffered from the highest rates of overdose deaths in the United States with an estimated 39% increase in 2019-2020 (John Hopkins – Focus on Racial Equity).

Acknowledging the barriers to treatment and recovery for racial and ethnic minorities is paramount in the discussion regarding the role of race in the opioid epidemic. An article published by The Substance Abuse and Mental Health Services found that, “research suggests that Black/African Americans with Opioid Use disorder have experiences limited access to the full range of medication-assisted treatment (MAT) when compared to whites” (Bechteler, Breland-Noble, et al. 2020, p. 8). The disproportionate impact of the opioid epidemic is an essential part of the discussion to develop policy suggestions that address these structural inequalities and disparate outcomes.

Social-ecological Framework: Interpersonal Level

The interpersonal level regards the different relationships such as family, friends, and co-workers who may help shape the beliefs, attitudes and behaviors of the individual (Jalali, Botticelli, et al., 2020). These different relationships significantly impact the perception of addiction and can affect the onset of opioid usage. Jalali & Botticelli et al., (2020) find that: (Section 2, Interpersonal Level)

> “People who have a family member with OUD are 10 times more vulnerable to misuse and overdose on the drug themselves and youth witnesses of family member overdose are more prone to overdose themselves. Individuals with a family history of opioid use are at a higher risk of suffering from symptoms of opioid dependence and becoming severely dependent.”

These trends depict the role that family and other interpersonal relationships play in the likelihood of drug misuse and addiction. One of the most important roles that these interpersonal relationships have in the road to treatment and recovery is emotional support (Jalali, Botticelli, et al., 2020).

Social-ecological Framework: Communal Level

The third level of the social-ecological framework is the communal level. The variables that this level considers are things such as, "geographic conditions, treatment accessibility, medication disposal services, workplace environment, prescribers' perception of risk, over-prescription of opioids or under-treatment of pain, types of prescription opioid formulations available, community norms, and access to legal and illegal opioids" (Jalali, Botticelli, et al., 2020). Community norms means analyzing the context and community in which the individual lives in, or is a part of. Research has demonstrated great geographical variation regarding opiate addiction and overdose deaths. One study found, "Overdose deaths are more prevalent in non-metropolitan areas relative to urban areas" (Jalali, Botticelli, et al., 2020). One explanation for this phenomenon is that the population demographic is statistically different from one geographic area to another. For example, one community may have older adults who work more physically demanding blue-collar jobs that may put them at risk for pain-related injuries that would necessitate an opiate prescription (Jalali, Botticelli, et al., 2020).

The cultural norms and economic divestment of a community is another important factor to analyze. For example, in communities faced with economic disinvestment and low-income, using and selling drugs may be the cultural norm and even a means for survival (Bechteler, Breland-Noble, et al. 2020, p. 7). Investing in these poverty-stricken communities and working on uplifting the socio-economic development can be a valuable tool in mitigating this.

This level of the framework also discusses the role of improving prescription practices, because it is one of the biggest detriments of the system and is one of the largest drivers of the epidemic. Proper physician training and implementing pain management training as one of the best methods to address the over-prescription of opioids and the prescribers' perception of risk.

One of the greatest factors that results in overprescription, is that physicians often lack the training and knowledge on opioid misuse and pain management, which leads to their inability to safely prescribe opioids (Jalali, Botticelli, et al., 2020). Implementing thorough training to physicians regarding over-prescription and how to identify at-risk populations and risk detection can be helpful in combatting the lack of physician awareness when identifying the perception of risk and over-prescription.

Social-ecological Framework: Societal Level

Of the factors discussed from the social-ecological framework, the societal level is one of the most encompassing. As seen in figure one, the larger societal context is the most comprehensive level, and it is one of the major factors involved in opioid misuse. The variables considered within this level include things such as, "opioid supply and demand, government regulations, economic conditions and unemployment rates, elements of the media, social stigma, discrimination and prejudice, advertising campaigns, educational campaigns, and law enforcement" (Jalali, Botticelli, et al., 2020). One of the greatest factors within this level is the role of the pharmaceutical industry in perpetuating a lowered sense of risk when it comes to opioid usage. As discussed in earlier sections of this paper, the pharmaceutical industry has played a major role in painting the false narrative of opioids. The image they have portrayed is that they are low-risk and overall have contributed to the underestimation of the risk of prescription opiates. Data supports the value and validity of policies such as, "Good Samaritan laws, naloxone access legislation, and Prescription Drug Monitoring Programs (PDMPs) (Jalali, Botticelli, et al., 2020).

The social-ecological framework demonstrates the complexity of the opioid crisis and allows for a more comprehensive understanding of the different factors that go into the epidemic.

Overall, it analyzes the different interconnections between individuals and the social and interpersonal factors contributing to the crisis. Understanding addiction and this crisis and an interconnected myriad of external and internal factors can help reduce stigma. Reducing this stigma is one of the most rudimentary steps to combatting this crisis. It will encourage individuals to seek treatment and promote a society that supports initiatives for treatment and recovery as opposed to criminalization and isolation.

Overall, this framework supports the understanding that addiction is not an isolated occurrence; there is more to analyze within the issue. This conceptualization draws attention to the value of government involvement and can help inform policymakers so that they can help develop prevention efforts from the foundational levels and implement interventions that target root causes. The policy efforts currently in place lack attention to the many social, cultural, and environmental factors that must be considered when developing sustainable policy. Current policy lacks attention to the determinants of the crisis and employs solutions that are centered around short-term alleviations to the dilemma. In short, the current policy landscape is shaped by a chain of band-aid policy solutions that are not sustainable. The result is a worsening crisis with overdose and death rates that continue to increase.

Current Policy Landscape

The current policy landscape is shaped by a wide and dynamic range of policy efforts at the federal, state, and local levels. Most recently, the government enacted three laws between 2016 and 2018 to address the opioid crisis at the federal level. According to a nonpartisan analysis conducted by the Congressional Budget Office, some of the most recent laws that have been federally instituted are strategies aimed to reduce the demand for opioids and reduce the

supply of opioids, all of which are ultimately aimed at reducing and mitigating the harm caused by them. (Duchovny et al., 2022). Despite the enactment of the laws, however, opioid-involved deaths continued to increase on a national scale (Duchovny et al., 2022). This could be attributed to the COVID-19 pandemic, however. According to the article, there were several barriers to opioid use disorder treatment during this time which may be one of the leading causes to the spike in opiate-related deaths. Regardless, it demonstrates a worsening crisis with recent federal legislation unable to implement sustainable or effective policy.

According to a study conducted by Lee et al., (2021), some of the most popular legislations and policies that have been enacted include:

> (1) PDMP access laws that provide access to the PDMP (2) mandatory PDMPs that require prescribers to access the PDMP database prior to prescribing opioids (3) prescription limit laws (4) pain clinic laws that regulate the operation of pain clinics, (5) Good Samaritan laws that provides immunity and other legal protection for those who call for help during overdose events; and (6) naloxone access laws. (p. 4)

Lee et al. (2020) in their study analyze these policies and discuss their effectiveness in combatting the crisis. Their research highlights many adverse effects after the enactment of such policies and discusses in their research how a lot of the laws that have been enacted, "may have the unintended consequence of motivating opioid users to switch to illicit drugs" (Lee et al., 2021 p.9). As this paper progresses, it is becoming more evident that the policies that are currently enacted are insufficient in tackling this multifaceted dilemma. Through analyzing the efficacy and sustainability of some of the most popular policies, this paper will analyze their shortcomings and in turn, engender more sustainable policy solutions.

Prescription Drug Monitoring Program (PDMP's)

One of the most widely adopted programs across the United States is the Prescription Drug Monitoring Program, or the PDMP. PDMP's have been implemented in 49 of the 50 states, with Missouri being the exception. The PDMP was implemented to mitigate and control prescription misuse and to monitor and analyze prescriptions for controlled substances (D'Souza et al., 2023). It requires scheduled reporting by pharmacies for information on medication data that was dispensed and requires for pharmacies to provide, "(drug name, dose), dispense data, and involved parties (patient, prescriber, and pharmacy)" (D'Souza et al., 2023, Function). It allows for individual patient reports and reports on the broader population, allowing data to be analyzed on a larger scale. Because the Prescription Drug Monitoring Program is run by the state and varies in implementation and a wide range of models exists. Researchers have analyzed and outlined the three main models that the states have adopted and implemented:

> One model is operated through non-mandated use, where prescribers and dispensers access the database voluntarily. Another model involves proactive reporting, where in addition to voluntarily checking databases, prescribers and dispensers also receive unsolicited reports on patients obtaining a dangerous dose or combination of controlled substances, or if they are acquiring prescriptions from multiple providers. Finally, a mandated use model is gaining recent attention – requiring prescribers to review PDMP data prior to prescribing controlled substances. (D'Souza et al., 2023, Function Section)

These different models highlight the complexity of these provisions and demonstrate a lack of uniformity across practice and implementation of the Prescription Drug Monitoring Program.

Who has access to PDMP data varies by state and is decided by state law (D'Souza et al., 2023). Across all the states, however, prescribers, physicians and pharmacists have access to the data, whereas other agencies such as Medicaid programs and law enforcement organizations do

not always have access (D'Souza et al., 2023). This causes inadequate collection of data across states, however, and causes the PDMP to have major defects in practice. Most states do not even require prescribers or pharmacists to check the PDMP report of the individual who is being prescribed a substance (D'Souza et al., 2023). Along with this, a lag time in data sharing exists, and researchers have discussed how there is an absence of tools that can read and synthesize the data produced by PDMP (D'Souza et al., 2023).

Li & Brady et al. (2014) find in their research that, "The overall death rate from drug overdose in state-quarters with PDMPs was higher than in state-quarters without PDMPs" (p.3). The figure below from Li & Brady's (2014) research demonstrates how since the implementation of PDMP, there has not been significant improvement in reducing overdose mortality rates across the states.

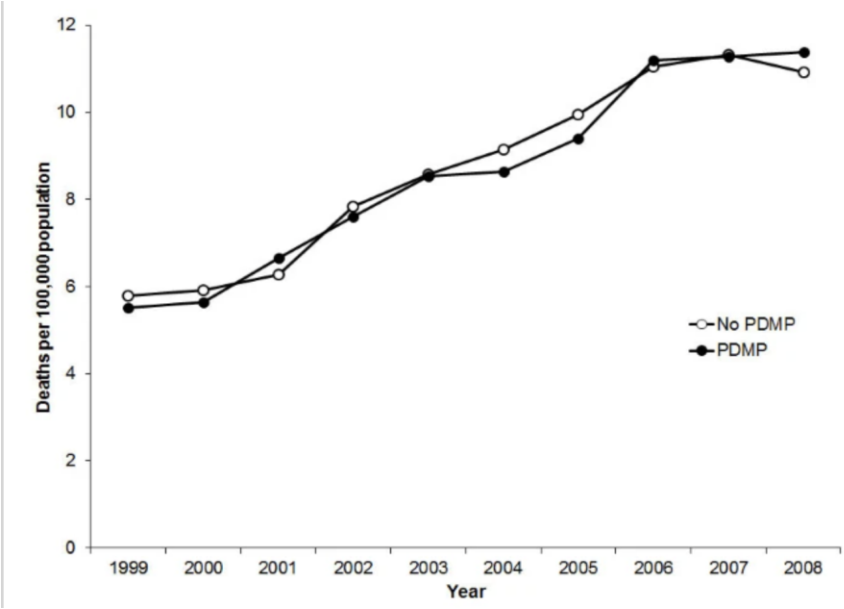


Figure 3 (Li & Brady 2014)

Not only has the PDMP shown to not be effective in combatting the effects of the crisis and reducing opiate overdose mortality, Li & Brady et al.'s (2014) study goes on to demonstrate

that, “multivariable modeling revealed that implementation of the PDMPs was associated with an 11% increase in drug overdose mortality” (p.3). The lack of effectiveness in a policy with a high degree of prevalence across the United States demonstrates just one of the shortcomings of U.S. opioid-related policies and how reform is needed on a national scale.

Medicated Assisted Treatment & Naloxone

Research has demonstrated that naloxone is one of the most impactful efforts in combatting high rates of opioid related mortality (Bohler et al., 2022). Naloxone is a life-saving medication that is administered to an individual who is actively overdosing, and it quickly reverses the effect of an overdose. According to the National Institute on Drug Abuse, naloxone is an opioid antagonist – it attaches to opioid receptors and reserves and blocks the effects of other opioids” (National Institute on Drug Abuse 2022). Therefore, while it is not a treatment for opioid use disorder, it can help reduce overdose death rates and can be lifesaving for an individual who is amid an overdose.

The policy landscape surrounding Naloxone has had an integral role in who has had access to it. This has historically been shaped by state laws and dependent on jurisdiction. According to Weiner et al., (2019), “Depending on state law some pharmacies distribute naloxone through a standing order or through direct pharmacist prescribing. Pharmacy availability, consumer acceptance, and out-of-pocket costs vary across jurisdictions” (p.2). Since then, the FDA approved the over-the-counter naloxone product ‘Narcan’ in March of 2023, making naloxone available across the United States in the form of a nasal spray. The FDA wrote in their press release, “Today’s action paves the way for the life-saving medication to reverse an opioid overdose to be sold directly to consumers in places like drug stores, convenience stores, grocery stores and gas stations, as well as online” (FDA 2023). Since then, the FDA has been

actively involved with stakeholders to ensure that naloxone is widely available. While access to naloxone and Narcan may not fix the underlying structures that has perpetuated the opioid crisis, studies have shown that, “expanding access and availability of naloxone in communities is among the most impactful intervention in decreasing opioid overdose deaths (Bohler et al., 2022). Despite Narcan becoming widely available to the public and being an important intervention in combatting overdose deaths, once the individual is reversed from their overdose, they are still dealing with the effects of addiction and dependence.

In fact, studies have shown that, “The short-term and 1-year mortality of patients treated in the emergency department for nonfatal opioid overdose is high. The first month, and particularly the first 2 days after overdose is the highest-risk period” (Weiner et al., 2019). Figure 4 below demonstrates the number of deaths after an individual was held and treated in an emergency department for the treatment of a non-fatal overdose and the x-axis is represented by days that passed within the first month (Weiner et al., 2019). This study was conducted in Massachusetts emergency departments, but it is worth analyzing due to the large-scale trends it may depict. Overall, it highlights how despite the effects of an overdose being reversed, those who go on to survive an overdose are still at high risk and go on to experience high mortality rates. Therefore, while the wide scale distribution of naloxone products, such as Narcan, may limit overdose death rates in the short term, it is not sustainable.

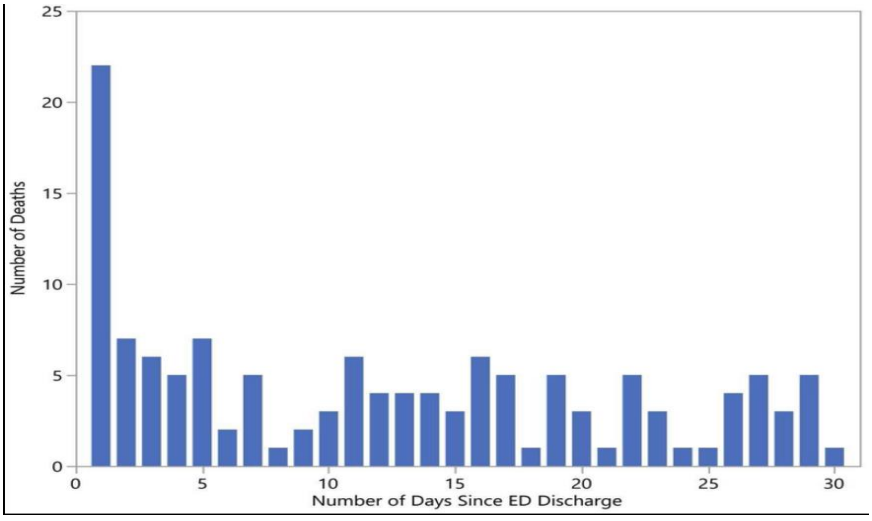


Figure 4 (Weiner et al., 2019)

These two policies were picked among a wide range of policies and legislative initiatives after careful consideration regarding what they can depict about opioid policy initiatives at large. Along with this, both initiatives carry a high degree of prevalence and are among the most widely adopted practices across state-lines and jurisdictions. Important take-aways from the analysis of The Prescription Drug Monitoring Program (PDMP) and the wide-scale adoption of medicated assisted treatment and naloxone/Narcan are: While both are effective in theory, they lack the sustainability stemming from their inattention to the foundational and rudimentary causes of the opioid crisis. Which means understanding this crisis for the multi-faceted dilemma that it is and taking the societal, community-based, interpersonal, and individual factors into consideration and centering policy from this approach.

The main issues with the Prescription Drug Monitoring Program, as seen through the studies and research that was analyzed, stems from: (1) its lack of uniformity and implementation across jurisdictions, (2) its fragmented database and inadequate data collection and (3) some states not even requiring review of the data system before prescribing substances to an individual. The implementation of naloxone products being an over-the-counter product had

undoubtedly saved numerous lives and has proven to be an effective method to reverse a potentially deadly overdose. However, as researched has depicted, it ignores the underlying causes of the overdose and once the individual survives the overdose, they are at high-risk and continue to face high mortality rates. The main issues with the wide-scale adoption of over-the-counter naloxone and Narcan products are: (1) it is a band-aid policy solution that lacks long-term solutions, (2) once the effects of an overdose are overturned, these individuals are high-risk and continue to face high mortality rates. Making naloxone available to the public and making it an over-the-counter medication is a significant step in the fight against increasing opioid-related deaths, however, this alone is not enough.

So far, this paper has explored various policies and their outcomes and effectiveness in combatting the opioid crisis. It has become evident that policies and legislation vary on a state-by-state basis and that each state is bound by the laws of their jurisdiction. What makes the policy landscape incredibly difficult for the opioid crisis, however, is the fact that each state struggles with its own set of challenges, cultural norms, and their own political landscape. Uniformity of policy and laws may not be the best practice in combatting this crisis, but shaping policy with attention to the underlying factors and societal context of the state is. This paper will shift toward conducting an analysis on four states and the practices and policies in which they have adopted.

Methodology: Interstate-Level Analysis

In 2021, the Centers for Disease Control and Prevention released a data table that ranked states based on the highest overdose death rates to the lowest. These numbers and death rates are calculated based on, “The number of deaths per 100,00 total population” (CDC- Drug Overdose

Mortality by State). The chart considers the differences in age-distribution and population size in the calculation of data.

Using this nonpartisan and transparent chart provided by the Centers for Disease Control and Prevention, the research part of this paper will conduct a comprehensive and comparative policy analysis on the two states that have the highest drug overdose mortality rates: (1) West Virginia and (2) Tennessee, and the states with the two lowest drug mortality rates (49) South Dakota and (50) Nebraska. According to the data table that was published in 2021 West Virginia had a death rate of (90.9), Tennessee had a death rate of (56.6), while South Dakota had (12.6) and Nebraska had (11.4) (CDC- Drug Overdose Mortality by State).

This policy analysis will conduct a comparative breakdown of these four states and the policy landscape of each to determine what exactly has caused the drastic variation in death rates. This paper will do so through a quantitative and qualitative data analysis approach.

By comparing these states that have disparate death rates, this research aims to conceptualize and make sense of the drastic difference. The aim of this research is to identify policies that work and provide an analysis as to why they work given their contextual factors. Moreover, the intent is to propose evidence-based policy suggestions and to provide an ideological framework that promotes sustainable and effective policy.

West Virginia

According to the CDC, West Virginia has the highest death rate (90.9) in the United States (CDC- Drug Overdose Mortality by State). In fact, in a congressional document submitted to the House of Representatives, the paper reads, “It is no secret that West Virginia is ground zero for the opioid crisis” (Mullins 2020). Figure 5 below depicts the “semi-synthetic overdose rates in West Virginia, Utah, Tennessee, Maryland, Maine, and the USA as a whole” (Cooper et

al., 2020, Fig 7). It demonstrates how West Virginia has consistently maintained the highest semi-synthetic overdose rates, although as of recently it has been decreasing with the highest velocity (Cooper et al., 2020, Fig 7).

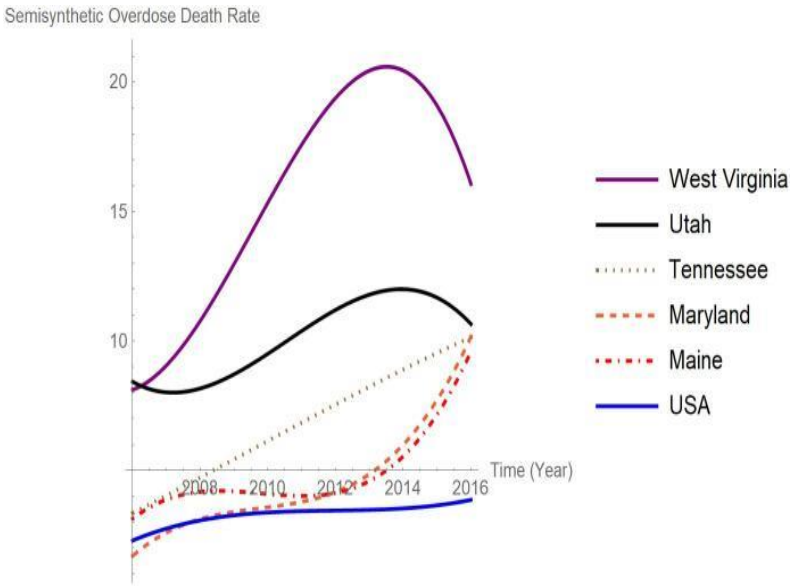


Figure 5 (Cooper et al., 2020, Fig 7)

Ranging from anti-stigma messaging and statewide educational media campaigns to being allocated federal resources and funds, West Virginia seems to be doing everything it can to combat their high death rate (Mullins 2020). According to Mullins (2020):

> As of December 20, 2019, West Virginia has received $147, 356, 427 in federal funds to address the opioid crisis. An additional $558,908, 723 in state funds have also been allocated since July 2016 to support the state's response to the crisis. This total does not include the state share oof expenses billed under the 1115 Substance Use Disorder OBJ Medicaid Waiver (p.7).

Not only is West Virginia receiving national support through funding, but they are also implementing strategic educational campaigns and allocating funding to organizations and agencies to what they refer to as the backbone of their behavioral health systems (Mullins, 2020, p.8). If West Virginia is doing everything it seemingly can, why is it that it has remained one of the nation's worst states for opioid related deaths?

West Virginia is, perhaps, one of the most prime examples of how the broader social-ecological context must be considered to fully understand the opioid crisis. Despite the policies being seemingly comprehensive and thorough, West Virginia's low levels of employment and its overall workforce shortages could be a major driver of the crisis in this state. According to Mullins (2020), "Overall, West Virginia has one of the lowest participation rates in the workforce of any state in the nation at 53.9%" (p.9).

Implementing more employment opportunities in the state can translate to less opioid related deaths. UCLA Professor, Dr Jian Li, who has conducted research on the social determinants of health and the opioid crisis states, "These new studies show that stable employment and supportive work environments may act as major social determinants of health in the context of the opioid crisis" (Smith – UCLA). Moreover, research conducted by The Department of Health & Human Services, found that:

> Poverty, unemployment rates, and the employment-to-population ratio are highly correlated with the prevalence of prescription opioids and with substance use measures. On average, counties with worse economic prospects are more likely to have higher rates of opioid prescriptions, opioid-related hospitalizations and drug overdose deaths (Gherter & Groves, 2018).

The findings from the Department of Health & Human Services merits closer attention to the underlying social and economic determinants to make sense of the opioid crisis. Figure 6 displays a telling relationship between opioid sales, poverty rates, and unemployment rates.

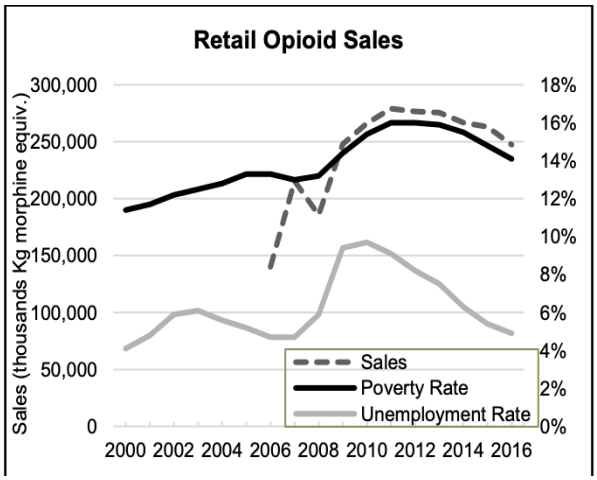


Figure 6 (Gherter & Groves, 2018)

The graph depicts an undeniable relationship between the three and shows how: when the sales of substances decrease, so does the poverty rate and unemployment rate, providing contextual evidence for a link between economic distress and substance abuse. Despite West Virginia's surface level policies being seemingly comprehensive and thorough, once you analyze the socio-economic landscape of the state, it is evident that more must be done at an internal level. The interplays and connections between West Virginia's unemployment rates and substance use rates underscore the importance of analyzing root causes of an issue to implement sustainable and comprehensive solutions that address underlying issues.

Tennessee

According to the CDC, Tennessee has the second highest drug mortality rate in the country at 56.6 (CDC- Drug Overdose Mortality by State). Figure 7 below shows how the

opioid-related overdose deaths only continue to rise in Tennessee and depicts how it is well above the United States average.

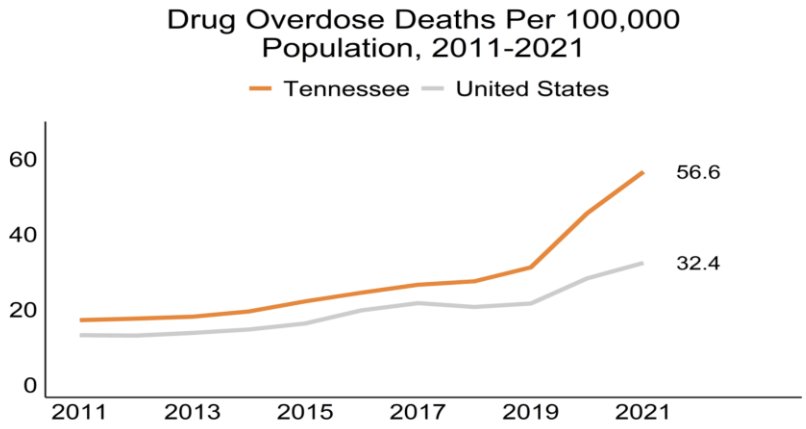


Figure 7 (KFF- 2024)

Tennesse is self-described as having "one of the most strict and aggressive opioid policies in the nation" (Tennessee- Law and Policies). They have recently enacted Public Charter 1039 which, "limits the duration and dosage of opioid prescriptions for new patients, with reasonable exceptions for major surgical procedures and exemptions that include cancer and hospice treatment (Tennessee- Law and Policies). In studies and literature published by the state of Tennessee, they attribute their crisis to the over-prescribing of opioids, and thus, have implemented legislation to regulate the prescription of opioids. In fact, Tennessee was ranked third in terms of "states with the highest opioid prescribing rates per one hundred people in 2016 (Our Tennessee-2018). To put it into perspective, "In 2016, more than 7.6 million painkiller prescriptions were written in Tennessee; the state's estimated population was 6.72 million" (Our Tennessee – 2018).

In a recent legislative document, the state wrote that they were doing everything that can to curb the recent effects of inappropriate prescribing and the overall dispensing of controlled

substances (Pellegrin, 2023 report to the 113th Tennessee General Assembly). This correlation between being one of the states that has the highest rates of distributing prescription opioids and being one of the states that has the highest overdose mortality rates, highlights how prescription drugs is one of the greatest avenues toward substance abuse.

Figure 5 below demonstrates how the number of opioid prescriptions in Tennessee has decreased. This has been made possible through the policies and efforts that Tennessee has implemented. Despite the number of written prescriptions decreasing, the number of opioid related hospitalizations and death continues to rise (Melton 2017). One study indicated that, "Tennessee's rates of opioid-related emergency department visits and inpatient hospital stays continued to rise in 2016" (Spears 2018, Fig 4). This is because as prescription opioids become more restricted, it results in people gravitating toward illicit opioids such as heroin, that of which is much more potent and deadly (Kourvelas et al., 2024). Therefore, although Tennessee has done all it can and has successfully reduced the amount of prescription opioids that are distributed, the damage has already been done.

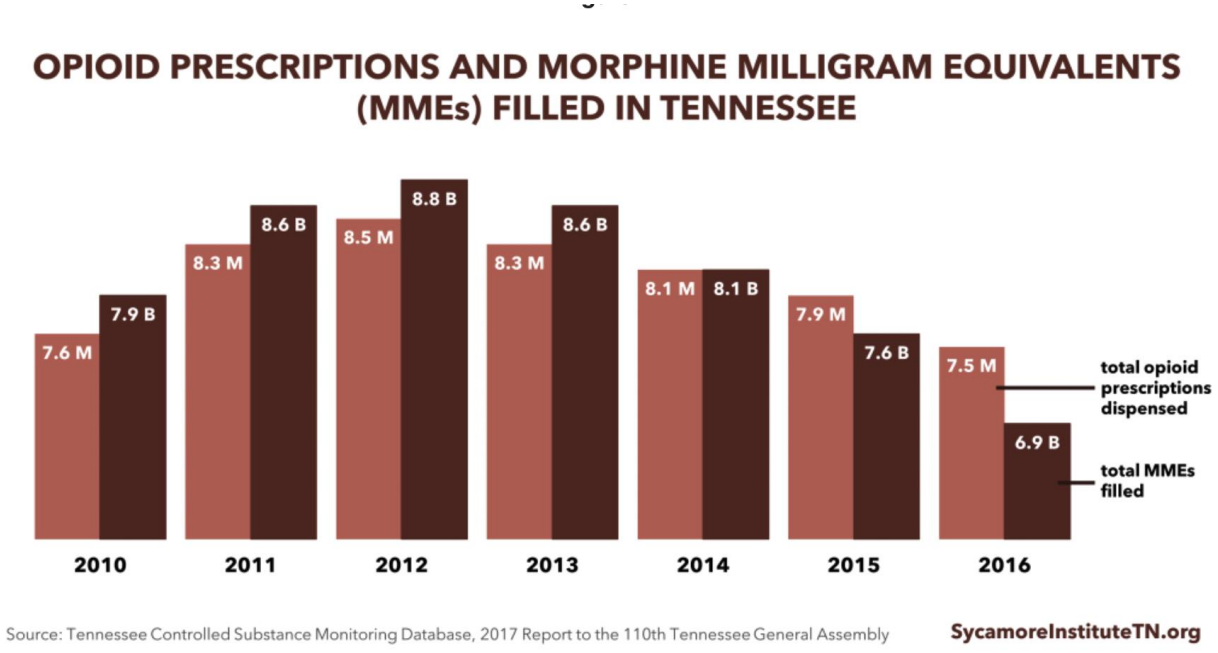


Figure 5 (Melton 2017)

One characteristic of the policy landscape in Tennessee is the allocation of funding toward law enforcement and increasing criminal penalties for opiate related crimes. According to a policy response update in 2018, a large sum of funding was allocated toward increasing criminal penalties and to hire more agents to the Tennessee Bureau of Investigation (TBI) (Pellegrin, 2023 report to the 113th Tennessee General Assembly). This is one of the largest detriments to their policy efforts and is a major reason why their overdose rates and drug issue remains so high. Upon observing other state's policies, their policies are one of the strictest regarding drug-related crimes. In fact, over 80% of all Tennessee crimes relate to drugs, and the incarcerated population is overwhelmingly represented by people with substance abuse disorders (Kourvelas et al., 2024).

The issue is that once these individuals are indicted to the justice system, they lack adequate resources to seek treatment for their disease and once they are released, they are stuck

in the cycle that led them there in the first place. Should Tennessee adopt strict legal ramifications for opioid use and high incarcerations for opiate –related cases, they should view the criminal justice system as a focal point for change. The National Institue of Health has an initiative known as the Justice Community Opioid Innovation Network, and their findings suggest that "Improved access to high quality evidence-based addiction treatment in justice settings is critical to addressing the opioid crisis," (NIH 2024). The focus should be to implement policy with the focus on restorative justice, and implementing change to the legal system so that those who are incarcerated for opiate related crimes receive the treatment and recovery needed for re-entry as healthy members of society.

South Dakota

According to the CDC, South Dakota has one of the lowest overdose mortality rates at 12.6 (CDC- Drug Overdose Mortality by State). In fact, one CDC report indicates that, "South Dakota had the biggest percentage decrease in overdose deaths in 2022, where deaths were down 18% from 102 to 84 deaths" (CDC, 2023). Therefore, indicating that not only does South Dakota has one of the lowest overdose mortality rates, but it also is decreasing at the highest velocity among all the United States. This merits the question: What has allowed South Dakota to achieve this status, and what can the rest of the United States learn from them?

South Dakota is characterized by having a strategic plan with an outlined effort to combat the crisis. According to the South Dakota Opioid Abuse Strategic Plan the first goal is to promote prevention and early identification (South Dakota Division of Behavioral Health 2022). Also, the South Dakota project brief indicates they collaborate with organizations who have unique positions in the crisis and help them so they can help combat the crisis (South Dakota Division of Behavioral Health 2022). The South Dakota policy efforts are characterized by

consistent and steady efforts targeted at preventative treatment and care and makes its key priority to establish support and to offer any needed resources that may help them in their treatment (South Dakota Division of Behavioral Health 2022). In 2016 South Dakota was granted a great sum of federal funding and in their 2023 Annual report they highlighted that their federal funding would be maximized in these areas: (1) Prevention and Early Identification, (2) Treatment and Recovery, and (3) Response to Opioid Misuse (South Dakota Departments of Health and Social Services).

South Dakota has implemented a program where individuals who are incarcerated and have been impacted by opioid use receive the treatment that they need. For example, the Minnehaha County Jail has implemented a system that works to, "ensure their re-entry back to community involves continued care coordination and treatment services in support of long-term recovery" (South Dakota Division of Behavioral Health 2022). Unlike the Tennessee plan, they seek to collaborate with county jails to ensure that re-entry is possible, and that the criminal justice system can also serve as rehabilitation for the treatment they need.

Another key characteristic of their policy involves the implementation of "The Care Coordination Program". This program is designed as a treatment resource hotline where those who are struggling with the effects of addiction or are affected by someone else's misuse can call. This hotline serves as a resource so that those who are struggling with substance abuse can discuss different treatment and resource options (South Dakota Division of Behavioral Health 2022). A core characteristic of this hotline indicates that it, "connects individuals to community resources that remove barriers to wellness; i.e. housing, transportation, employment" (South Dakota Division of Behavioral Health 2022). Ultimately, their focal point is to be able to provide the resources and support so that individuals can be connected to the resources that would best help them in their recovery.

South Dakota's policies contrast greatly to the policies of Tennessee. Tennessee has what they refer to as one of the strictest policies and guidelines in the United States, they also have high rates of incarceration for drug related crimes. In contrast, South Dakota has policies set in place so that those who are struggling with addiction can call a government sponsored hotline so that they can connect them to the resources that they need to recover. Along with this, Tennessee has allocated a lot of their federal funding toward hiring more officers to help crack down and implement stricter laws relating to drug use. Whereas, South Dakota has implemented funding targeted at implementing rehabilitation programs in criminal justice systems so that those who are incarcerated can receive treatment and experience re-entry into society. As seen in these two contrasting states, they both target different facets of the crisis, with South Dakota implementing policies centered around community-based solutions that are more sustainable due to their attention to root-issues of the dilemma.

Nebraska

At 11.4 Nebraska has the lowest death rate in all the United States (CDC- Drug Overdose Mortality by State). Nebraska is characterized by the implementation of careful prescribing guidelines and paying specific attention to the role of physicians and their prescribing practices. Nebraska has implemented a public health system where prescribers and clinicians must adhere to strict guidelines before prescribing a patient with opiates. In general, prescribing practices look toward alternative treatments to pain before prescribing opiates. The Guidelines explicitly state under the 'Assessing risk and addressing harms of opioid use' section of the guidelines, that "Clinicians should avoid prescribing opioid pain medication and benzodiazepines concurrently wherever possible" (Reynoldson et al., 2017 p.9). Unlike many other states, physicians are strongly advised against prescribing opiates for pain and look to alternative methods first.

The Nebraska Pain Management Guidance Document (2017) clearly indicates that "before starting and periodically during continuation of opioid therapy, clinicians should evaluate risk factors for opioid related harms" (Reynoldson et al., 2017 p.9) Nebraska law is strictly enforced so that an individual's opiate prescription is severely limited and that no one below the age of 18 can have any more than a seven day supply of prescription opioids. This demonstrates an understanding of the role that physicians have in perpetuating the opioid crisis and it considers the fact that prescription opiates are often an avenue toward addiction and opiate misuse.

Discussion: Policy Analysis

The comprehensive policy analysis between West Virginia, Tennessee, South Dakota, and Nebraska reveals several key conclusions that can add to the discussion in finding sustainable and comprehensive policy efforts to combat the opioid crisis. First, it demonstrates the diversity of approaches in the United States that ranges from strict and aggressive policies to initiatives more rooted in prevention and restorative justice. This highlights the importance of implementing solutions rooted in tailoring to the needs of the state. Another important lesson is the importance of structural legislation that addresses the underlying and structural issues that are conducive to the opioid crisis. These structural issues range from factors such as unemployment to the unequal distribution of resources and disparate access to healthcare. The need for structural policies aimed at investing into the communities who need it most is arguably one of the most important factors in combatting this crisis.

This paper began by providing an in-depth analysis of the social-ecological factors that must be considered when analyzing the opioid crisis. The policy analysis conducted has demonstrated the conceptualization of the complex myriad of factors and political dynamics that

make up the opioid policy landscape. Moreover, this policy analysis was conducted with specific attention to the social-ecological framework of the opioid-crisis, and paid specific attention to the underlying factors that may play a role in the crisis for each state.

The policies instituted by these states are characterized by their accomplishments and flaws. While some of the policies demonstrated a seemingly promising outcome, vulnerabilities were elucidated, and the shortcomings demonstrate a lack of legislation at structural levels.

The most observable difference between the four states is that they all focused on a unique facet of the crisis. For example, South Dakota was mainly concerned with not prescribing opioids entirely, and they focused on finding alternative methods for the treatment of pain. Tennessee's approach focused on cracking down on the legality of the drug problem and was shown through the high percentage of individuals who were incarcerated for drug-related crimes. While West Virginia had a comprehensive plan and strategy, their unemployment rates are undoubtedly playing a major factor in their high mortality rates.

Overall, West Virginia showed the interconnected roles of socio-economic and institutional factors and how they manifest within the opioid crisis. Tennessee's self-described "strict and aggressive policies" put great emphasis into stricter laws and harsher criminal punishment toward cases involving opioids. Meanwhile, neglecting contributions to its criminal justice system, which should instead be a focal point for restorative justice.

South Dakota seemed to implement elements of restorative justice coupled with initiatives aimed at combatting the crisis at its foundational levels. For example, The Care Coordination Program is designed to connect struggling individuals to resources that can help them through the different barriers they may face throughout their recovery process. This program's implementation indicates an understanding for different social-ecological factors at

play in the opioid crisis. It also helps promote a system where individuals who are struggling with addiction and opioid abuse do not feel as if they will be criminalized or face harsh punishments for their addictions. Finally, the guidelines in Nebraska merit the observation that opiate prescribing practice ought to be more uniformed across the states and the opiates should be the alternative solution to pain and not the main one. This comprehensive analysis demonstrates suggestions and lays the blueprint for comprehensive and sustainable policy recommendations at the national and state levels.

Conclusion

The literature review, the research conducted, and the policy analysis that was studied all highlight how the opioid crisis manifests itself as a multifaceted dilemma that calls for an understanding of the complex social and ecological systems that shape the epidemic. The social-ecological framework demonstrated that addiction is not the result of a single factor or is not based on individual choice. The social-ecological framework posits the understanding that our society is shaped by broader and more complex social systems- such as individual factors, interpersonal, community, and societal implications. Conceptualizing this framework and understanding the interconnectedness, can help policymakers implement comprehensive solutions that are not merely band-aid policy solutions that do not address the systemic issues at play.

The implication of this study calls upon policymakers and legislators to implement innovative reform aimed at root and structural causes. Intervention is needed at all levels, and it is particularly needed at the most rudimentary. Invest in schools, invest in our criminal justice systems, invest in poverty-stricken communities, and use prisons as a focal point for restorative justice aimed at promoting the re-entry of healthy and contributing members of society. This

plan does not call for an increase in the budget, nor does it call for more spending. States already receive federal funding, in fact, “in 2023, California, Florida, and Ohio each received more than 100 million from the Federal State Opioid Response Grant Program” (USA FACTS, 2022). In total, the program allocated about $1.5 billion to substance use disorder treatment, emergency overdose treatments like naloxone, and recovery support programs (USA FACTS, 2022). Therefore, this plan does not call for an increase in the fiscal budget, instead, it calls for the reallocation of spending and suggests that the spending is not being allocated correctly to the right facets of the dilemma. Simply limiting the supply of opiates is no longer a feasible plan, it only results in individuals turning to illicit drugs that are more potent and deadly. Providing naloxone may alleviate the short-term effects and prevent death, but it fails to address the issue from the root.

Of utmost importance is the need to invest in the communities where overdose and addiction rates are at their highest. Community-based efforts centered in investment and restorative justice are key to combatting this crisis. Something is to be learned from South Dakota & Nebraska, the states with the lowest levels of overdose mortality rates in the United States. Their state policies were centered around not relying on prescription opiates to relieve pain symptoms and discovering alternative solutions instead. South Dakota specifically looked to provide a hotline centered around providing support and the connection to resources that they may need to help their recovery. Additionally, these states look toward the criminal justice system as a focal point for change and have instituted a system based on offering restorative justice, so that when they exit the prisons, they can experience a smooth re-entry into society.

The crisis is worsening, and more lives are being lost than ever before. The people who are affected by the crisis stem far beyond the individual. The implications are felt across families, generations, communities, and in broader society. Lives are being lost every day and

the death rates only continue to increase. There is a dire need for change, and this paper seeks to provide innovative thinking that re-imagines the systems set in place. The lives that are being taken are in the hands of the pharmaceutical industry and every other major stakeholder that has perpetuated this inherently flawed system.

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