Evaluating the Impact of New England Governors on State Policy Responses to the Opioid Addiction Epidemic

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Chapter I: Contextualizing the Opioid Crisis in Science and History

i: Introduction to the Opioid Crisis

There is hardly an American whose life has not been touched in some way by the tidal wave of opioid addiction and overdose deaths currently sweeping the nation. As of 2016, it is estimated that there are two million and four hundred thousand Americans living with opioid addiction (IMS Institute 2016). In 2016, approximately eighty percent of the global opioid supply was consumed in the United States (Gusovsky 2016). Europe and Canada combined consumed fifteen percent, leaving the rest of the world with just five percent of the global opioid supply for their use (Gusovsky 2016). Now the U.S. is suffering the consequences of this greed.

The U.S. has experienced a sharp increases in rates of use, abuse, and dependence of prescription opioids, opioid-related emergency department visits, and overdose deaths among all age groups in all states (Keyes et al 2014).

Figure 1. United States Opioid Overdose Deaths, 1999-2015

The Henry J Kaiser Family Foundation 2017

Opioid-related mortality rates have been higher among men, non-Hispanic Whites and American Indian/Alaska Natives, middle-aged individuals, those living in rural areas, and those
of lower socioeconomic status (King et al 2014). Reported overdose death rates are most likely understating the scale of opioid overdose deaths, as this data is obtained from death certificates reporting the cause of death as an opioid. Relying on death certificate data is an imperfect measure, as the document may fail to name the drug involved in an overdose, leading to underestimation of drug-specific overdose rates (Rudd et al 2014). These demographic trends of who is most affected by opioid-related mortality and opioid addiction vary by time and by specific drug (King et al 2014). In contrast to the late twentieth century characterizations of heroin abuse as an inner city problem affecting only poor non white individuals, since around 2002, cohorts of heroin users entering substance abuse treatment are more likely to be white, middle-class, and living in non urban areas. These demographic groups have had the largest increases in rates of prescription opioid abuse since the early 2000s (Compton et al 2016). Writer Sam Quinones describes the opioid crisis succinctly: “children from the most privileged group in the wealthiest country in the history of the world were getting hooked and dying in almost epidemic numbers from substances meant to, of all things, numb pain” (Quinones 2015). How did we get here? Where do we go from here?

The increased prevalence of opioid addiction and overdoses has put rising pressure on state finances. States bear an increasing share of the burden in paying for substance abuse treatment. In 1986, the U.S. spent $9 billion on substance use treatment, paid for equally by public and private funds. In more recent years, there has been a shift to a heavier burden on public funding, particularly state funding, to pay for substance abuse treatment (Urahn et al 2015). This shift has been driven in particular by growth in the role of Medicaid and other state and local spending, as well as heavy reductions in the role of private insurance (Urahn et al 2015). One study reported that in 2007, substance abuse treatment accounted for $1.1 billion of
the total healthcare costs associated with opioid abuse and misuse, or just two percent of total costs. This spending was comprised primarily by state and local expenditures, followed by federal and private expenditures (Birnbaum et al 2011). In 2009, the most recent year for which data are available, the U.S. spent $24 billion on substance use disorder treatment (for treatment for all types of substances). Sixty-nine percent of this funding came from public sources, including state and local governments, Medicaid, Medicare, and federal grants. Private health insurance and individual out-of-pocket spending accounted for the rest (Urahn et al 2015). In 2009, state and local funds paid for $7.6 billion, almost a third, of all spending on substance abuse treatment. Counting state Medicaid expenditures, state and local spending totaled $9.4 billion (Urahn et al 2015) in 2009. By 2020, we can expect public spending to represent seventy one percent of the total for such treatment, with Medicaid as the single largest source of funding (Urahn et al 2015).

The Affordable Care Act (ACA) represents the most far-reaching federal intervention into the crisis. Under the act, substance abuse treatment was classified as an Essential Health Benefit, meaning that all insurance had to cover it. However, access to substance abuse treatment still varies dramatically by state and by individual’s insurance and financial circumstances. President Trump has declared the opioid crisis a Nationwide Public Health Emergency, allowing for expansion of telemedicine services, fast tracking of hiring in the Department of Health and Human Services, shifting of treatment resources for HIV/AIDS patients, and Department of Labor grants for workers displaced by the opioid addiction. President Trump has also established a President’s Commission on Combating Drug Addiction and the Opioid Crisis (The White House 2017). However, these measures don’t provide new funding and resources for substance abuse treatment for state or local governments. Despite this
commitment to working on the opioid addiction epidemic, the Trump administration and the Republican leaders of Congress have dedicated themselves to repealing the ACA. Senate Majority Leader Mitch McConnell first announced it as a top priority on November 9, 2016, and then-President Elect Donald Trump first advocated for simultaneous repeal and replace on November 13, 2016, early on in the administration (Roubein 2017). It is likely that progress in managing the crisis will be greatly curtailed if Congress ever succeeds in repealing and replacing the ACA. Therefore, state policies will continue to be the main source of public policy and funding for the opioid crisis. As the regulators of health care licensing and practice, states are better positioned than federal agencies to monitor and discipline inappropriate and illegal prescribing habits (Kenan et al 2012). As such, it is more important than ever to study how and why state policy responses to the opioid crisis have come into existence.

State policy responses to the opioid crisis vary greatly. In 2016, the National Safety Council, a nonprofit organization that conducts research and performs public policy lobbying on preventing accidental deaths, released a report on the opioid crisis entitled “Prescription Nation 2016.” The report provides an illustrative snapshot of the intense variation in state policy responses to the opioid crisis by evaluating which states have complied with its six policy recommendations for state-level actions to address the opioid crisis: implementing mandatory prescriber education and opioid prescribing guidelines, the elimination of pain management clinics, the creation of prescription drug monitoring programs (PDMPs), increasing access to the overdose reversal drug naloxone, and increasing availability of substance abuse treatment (National Safety Council 2016). No states met all six recommendations at the time of the report.
Table 1. Variation in Implementation of the Policies Recommended by the NSC, 2016

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National Safety Council 2016

The New England region (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont) illustrates the variation in state policy responses to the opioid crisis particularly well. The size of the economies relative to the rest of the country's, racial and age population demographics, and geography of the six New England states are all fairly similar, and a common history and strong regional identity binds the region together culturally.
Figure 2. The United States New England Region

Figure 3: U.S. And New England Prescription Opioid Overdose Death Rates per 100,000 Population (Age-Adjusted), 1999-2016

The Henry J. Kaiser Family Foundation
Despite these similarities, different policy responses and levels of policy response to the opioid crisis have emerged:

Figure 5. Number of National Safety Council Recommended Policies Implemented Per State:
This thesis seeks to understand why policy responses to the opioid crisis vary even in a geographically compact region like New England. What accounts for variation in state policy responses to the opioid crisis in New England states? I argue that the variation of New England state policy responses to the opioid epidemic can be partially explained by the prioritization of the issue by state governors. I contend that there is a positive relationship between a governor’s prioritization of the opioid crisis within in his or her policy agenda, and the percentage of the state budget allocated for opioid crisis response programs and policy initiatives.

ii: How Do Opioids Work?

To fully grasp the extent of this crisis and the challenges it poses to New England state governments, one must first understand of the neurobiology of how opioids function in the body, what makes them so addictive, and the history of their use. In layman’s terms, “opioid” typically refers to the final pill or powder form of opioid drugs, but the scientific use of this term does not solely refer to prescription painkiller medications or heroin. Rather, the term “opioid” refers to any compound that binds to and activates certain proteins, called receptors, located in the membranes in certain nerve cells. There are several types of receptors, and opioids primarily act upon the mu opioid receptors, which are involved in pain management and are located both in the central nervous system (the brain and spinal cord) and in the peripheral nervous system (the nerves spread throughout the body) (Rosenblum et al 2008). These receptors exist in our bodies for endorphins to bind to. Endorphins are chemicals released in the brain to dull pain, and are endogenous (meaning internally produced) opioids (Rosenblum et al 2008). When endorphins activate the mu receptors, dopamine is released, reducing the sensation of pain. Exogenous (meaning not produced in the body) opioids mimic endorphins, and compete with them to attach to the same mu receptors. Compared to endogenous opioids, exogenous opioids lead to a greater
flood of dopamine to the system, causing intense feelings of euphoria that cannot be matched by the dopamine response associated with endorphins.

As seen below in Figure 6, the broad category of “opioids” includes opium, which is derived from the poppy flower, opium alkaloids, which are isolated from opium (such as morphine and codeine), semisynthetic opioids, which are partially derived from opium and partially derived from synthetic additives (such as heroin, buprenorphine, and oxycodone), and synthetic opioids, which are completely synthetically produced (such as methadone and fentanyl) (The National Alliance of Advocates for Buprenorphine Treatment, n.d.).

**Figure 6. Categories of Opioids**

Medical and law enforcement professionals use varied terms to refer to opioids of different categories and in different contexts. As the opioid addiction epidemic has grown in
severity, many of these terms have entered the common lexicon and are often used interchangeably and incorrectly. However, these terms have specific meanings that must be unpacked to bring clarity to the myriad ways in which medical professionals, law enforcement, and even politicians talk about the crisis. The term “narcotic” is not a medical term but rather a legal designation denoting an opioid painkiller for law enforcement purposes (Rosenblum et al 2008). Historically, the term “opiate” referred only to naturally occurring endogenous drugs derived from the poppy and opium, while the term “opioid” was used to refer to all compounds that bind to mu receptors, endogenous opioids and exogenous alike (Rosenblum et al 2008). Now, using both terms to make a designation between synthetic and non-synthetically produced exogenous opioids has fallen out of favor in the medical community as of late, and using “opioid” to refer to either type of exogenous opioid is more common (Rosenblum et al 2008). One may also hear of opioid painkillers referred to as opioid “analgesics,” a term referring to painkilling properties. For simplicity’s sake, I will be using the term “opioid” throughout this thesis, which should be interpreted to refer to all exogenous opioids regardless of synthetic or nonsynthetic origin. When referring to both endogenous opioids and exogenous opioids at once, I will specify by stating “opioids and endorphins” or similar. When discussing only prescription opioid medications, I will clarify by using the addition of the word prescription, but when referring to both illegal opioid drugs and prescription opioids at once, I will use the term “opioids.”

### iii: How and Why Are Opioids Addictive?

Physiologically speaking opioids are a central nervous system depressant, meaning that in addition to stopping pain, they release, to varying degrees, a calming sensation that makes the user feel safe and happy (The National Alliance of Advocates for Buprenorphine Treatment,
The National Alliance of Advocates for Buprenorphine Treatment website describes the high that can be obtained from opioids as feelings of “intense joy and comfort, more so than can be obtained naturally. It is similar to feelings of great accomplishment, or achievement of a lifetime goal, rather than an impairment.” This is the euphoric feeling that one can begin to crave upon repeated exposure, as nothing in real life begins to live up to the emotional or physical expectations that the drug has created for the nervous system (The National Alliance of Advocates for Buprenorphine Treatment, n.d.).

Chronic use of opioids leaves individuals at risk for opioid induced hyperalgesia, reduced tolerance to the drugs, and addiction (Sprouse-Blume et al 2010). Hyperalgesia is the increased sensitivity to pain stimuli. If someone takes opioid painkillers to manage their pain for long periods of time, it is likely that they will become more and more sensitive to feeling pain, thus requiring more medication (Volkow et al 2016). The same initial level of pain will feel worse, requiring increased dosage to combat the pain, even up to ten times the original dose for some (Volkow et al 2016). Long term repeat usage of opioid painkillers may also reduce one’s tolerance to opioids, meaning that patients begin requiring more and more of an opioid to reach the same level of pain relief. This process is still being studied, but is thought to occur when the brain responds to long term opioid use by producing anti-opioid peptides which bind to the mu receptors and make them less susceptible to the effects of opioids. Thus, more of an opioid drug is necessary to maintain the same degree of dopamine response (Sprouse-Blume et al 2010).

Mu receptors are also linked to the structures deep in the brain that control reinforcement and reward mechanisms, mood, and stress (Rosenblum et al 2008). This link puts users at risk of addiction, defined as “a brain disease resulting in a loss of control over drug taking or in compulsive drug seeking, despite noxious consequences” (Sprouse-Blum et al 2016). The
activation of certain pathways in the central nervous system causes a positive reinforcement process, euphoria, when the molecules first bind to the mu receptors, and then a negative reinforcement mechanism, dysphoria, when the user experiences a deep emotional and physiological crash as the effects wear off (Rosenblum et al; Kolodny et al). The physical sensations of withdrawal, which can be uncomfortable at first and then intensely intolerable, include severe nausea and vomiting, anxiety, hot or cold flashes, intense sweating, and a rapid or irregular heartbeat. Over time, the user’s previously existing motivational pathways may be replaced by the emotional and physical craving of the drug to stave off the uncomfortable withdrawal and release dopamine to regulate the mood of the user (Sprouse-Blume et al 2010). The long term use of opioids suppresses the body’s production of endogenous opioids, creating less competition between endorphins and the used drugs, and suppresses the production of mu receptors, meaning there are no new receptors created to reduce competition between opioids and endorphins (Sprouse-Blume et al 2010). Both processes inhibit the user’s capacity to experience the positive feelings associated with dopamine without the use of opioids to jumpstart dopamine release. The long term use of opioids can structurally and functionally change the parts of the brain that handle rewards and motivations, creating a reliance on opioids to modulate emotional and physical wellbeing (Kolodny et al 2015).

Changes in reinforcement and reward mechanisms leading to addiction do not happen for all who are exposed to opioids (Rosenblum et al 2008). Some research indicates that addiction occurs in only a small percentage of those exposed to opioids (Volkow et al 2016). For many people who take opioids to control acute pain over extended periods of time, there are apparently no overt long term effects on these reinforcement and rewards pathways, and many individuals do not become addicted (Rosenblum et al 2008). Recent studies point to very low rates of opioid
addiction among those taking opioid medications in the short-term, typically defined as ninety days after a surgical procedure or injury (Shah et al 2017; Sun et al 2016). However, many common surgical procedures are associated with patterns of of chronic opioid use past this period (Sun et al 2016). Researchers believe that certain individuals may be more susceptible to addiction than others, but there isn’t a clear consensus yet. The biological determinants of susceptibility to opioid addiction are still being studied (Rosenblum et al 2008). Recent medical professional prescribing guidelines still conclude that long-term use of opioid medications can be effective for patients who are carefully selected and monitored throughout their exposure to opioids (Chou et al 2009).

Certain populations have a higher risk for developing opioid addiction and suffering an overdose due to behaviors and demographic characteristics (Keyes et al 2014). King et al (2014) identified six ways in which the behaviors and traits of opioid painkiller users may contribute to increased opioid-related mortality: through diversion, doctor or pharmacy shopping, polydrug use (i.e., using multiple drugs in addition to opioids, resulting in fatal drug interactions), drug substitution, sociodemographic characteristics, and a history of substance abuse. The presence of any or many of these six factors potentially increases an individual's’ risk of opioid-related death (King et al 2016). Environmental factors such as economic deprivation, inequality, and structural discrimination, and social factors such as family composition, peer influence, and stress may be risk factors for drug use (Keyes et al 2014). Endogenous factors such as each individual’s genetic vulnerability, neurobiological factors, pharmacological sensitivity, personality traits, psychiatric morbidity, gender, and age also have a strong influence on one’s likelihood to use, misuse, and develop addiction to drugs (Keyes et al 2014). The interactions between demographic factors
such as race and ethnicity with drug use remain unexplained, but Black and Hispanic individuals have lower overall rates of nonmedical prescription opioid use (Keyes et al 2014).

Geographical context also shapes risk of drug use (Keyes et al 2014). While availability of prescription opioids has increased all over the country regardless of rural/urban status, there is evidence that these medications have become more available in rural areas more so than in urban areas (Keyes et al 2014). Individuals residing outside of metropolitan areas have higher rates of drug poisoning deaths in general, and higher rates of deaths from opioids specifically (Keyes et al 2014). Opioid overdoses have increased at a rate more than three times as high in nonmetropolitan counties than in metropolitan counties (Keyes et al 2014). Prescription opioid related deaths are higher in rural areas even after adjustments for population density have been made (Keyes et al 2014). The ratio of recreational to medical users of prescription opioids is higher in rural areas as well (Keyes et al 2014). Rural populations are on average older than urban populations, and thus rural populations might have greater instances of chronic pain. Areas with an older workforce have less new economic infrastructure, and adverse economic conditions and high unemployment rates may contribute to greater risk of drug use (Keyes et al 2014). Rural areas have faced job sector and industry shifts, leading to economic deprivation, high rates of unemployment, and fewer opportunities for high-paying stable jobs (Keyes et al 2014). There is also evidence that chronic pain and injury are more common in rural areas than urban areas (Keyes et al 2014). Rural areas may therefore have more individuals being treated with prescription opioids (Keyes et al 2014), potentially granting more opportunity for diversion from friends and family.

Young adults who stay in economically deprived areas may have a greater accumulation of risk factors for drug use (Keyes et al 2014). Between 2002 and 2014, drug overdose mortality
rates more than doubled in every New England county, and not just the rural ones (Monnat 2016). But in 2014, the counties with the highest overdose rates also had rates of poverty, disability, and unemployment that exceed New England averages, and above-average declines in manufacturing and manual-labor occupations since 1970 (Monnat 2016):

Figure 7: Comparison of Drug Overdose Deaths per 100,000 in 2002 and 2014 by New England Counties

\[\text{Drug Overdose Deaths per 100,000 in 2002 & 2014}\]

\(\text{Bissett 2016}\)

iv: How Do Opioid Overdoses Happen?

Opioids slow down mental function, creating an altered level of consciousness that leaves the user woozy and disoriented, and in large enough quantities can suppress the central nervous system so much that the user loses consciousness. Opioids act upon the brainstem, which controls breathing function, and slow the user’s breathing. In an overdose, the brainstem slows
the person's breathing down so much that they enter respiratory distress, and eventually respiratory arrest. The person will become apnic, meaning that they are no longer breathing, and then hypoxic, meaning that they are not receiving enough oxygen due to poor circulation causing a lack of gas exchange at the cellular level. An affected individual will also have highly constricted pupils that are unresponsive to light and may be cyanotic, meaning their face will turn blue from a lack of oxygen. As the tissues of the heart does not receive enough oxygen, the affected individual will enter cardiac arrest, and effectively die.

v: Overdose Reversal

The first lifesaving treatment provided to an overdose patient is to try to regain respiratory function using CPR and ventilatory support from a bag valve mask. If first responders cannot get the patient to breathe again using ventilation alone, the drug naloxone is used to restore breathing function and circulation in those suffering respiratory arrest and cardiac arrest. Naloxone is commonly thought of as the drug given to bring people back to consciousness, but it merely functions to restore breathing function. The opioids discussed in section iii are agonist drugs, meaning that they bind to and activate certain receptors in the brain (in this case, the mu receptors). In contrast, naloxone is an antagonist drug, meaning it binds to a receptor without activating it and reverses the effects of the agonist drug. When naloxone is administered to a patient, it binds to the mu receptors, removing and blocking the opioid agonist molecules from the mu receptors. Once it has bound to an opioid receptor in place of the opioid agonist, naloxone does not signal the receptor to release dopamine, like an opioid agonist would. Instead, its presence stops the depression of respiratory function that has taken place in response to the opioid agonist already present in the user’s nervous system. It can take multiple doses of naloxone to restore respiration, depending on how much opioids the patient has ingested. If the
person has overdosed on a large enough quantity of opioids or has not been breathing for a very long time, attempts to use naloxone to revive respiratory effort will most likely be unsuccessful. Naloxone can administered through a vein, a bone, a muscle, into the layer between skin and muscle, or through the nose. Naloxone is the generic name, but it is better known as the brand names Narcan, a canister with a spray nozzle that is administered nasally to to a patient, or Ezvio, an auto-injection device that is administered to the upper thigh (National Institute on Drug Abuse 2016).

vi: Introduction to the History of Opioids

In addition to grasping the science behind opioids, we must also understand the history of opioid use and abuse globally and specifically in the United States before we can address the current opioid crisis and its implications for state policy. This section traces the history of humanity’s relationship to opioids, the research and regulatory factors contributing to increased availability of prescription opioids in the past twenty years, and the subsequent increased prevalence of heroin in the late 2000’s.

vii: The Global History of Opioid Use and Abuse

Humanity’s first opioid was opium, which is harvested from the unripe seed pods of the poppy flower and has been used medicinally and recreationally for at least two thousand years by many different cultures. Opium was brought to Europe and Asia from the Middle Eastern region in the sixteenth century, where it flourished as both a medication and a recreational drug. Throughout the following centuries many medicines, such as a laudanum, contained opium. The mechanisms behind most diseases weren’t understood and there were few true cures available for many maladies (Kolodny et al 2015). Opioids seemingly miraculously took away pain, which was enough of a “cure.” By the nineteenth century, researchers isolated morphine and codeine
from opium and pharmaceutical companies began producing them as standalone medicines, which became heavily prescribed by doctors for even minor issues, leaving many patients addicted. In some ways, today’s opioid addiction epidemic is history repeating itself. Between the 1840s and 1900, American opioid consumption rose 538% (Kolodny et al 2015).

Scientists began searching for an opiate that would deliver the same relief from pain without addictive properties (Melzack 1990). Heroin was originally thought to be non-habit forming when it was first developed as a medication by Bayer Pharmaceuticals in 1898, but its addictive qualities soon became apparent as doctors found themselves dealing with a rash of heroin addicts. Heroin was subsequently outlawed in the U.S. in 1924. Other painkillers such as aspirin were developed during this period as a safer solution to pain management (Kolodny et al 2015). But even as the causes of many painful diseases became better understood and medical cures advanced, and doctors stopped prescribing them as liberally, opiates did not disappear. Morphine continued to be used for patients with severe pain as a result of terminal illnesses like cancer, and for hospice care. Heroin continued to be abused, looming large in the country’s collective consciousness as a perceived singularly inner-city problem throughout the 20th century. Throughout the 1970’s and 1980’s, various synthetic opioid medications were introduced to treat acute pain after surgery.

Doctors were concerned about the risks of addiction and were often hesitant to prescribe opioids, leading to what some would later claim was undertreatment of pain in patients with cancer, acute disorders, and chronic pain due to the belief that the risk of addiction far outweighed the benefits of pain management (Rosenblum et al 2008). Chronic pain, typically defined as pain that persists for at least three months, became a key player in the healthcare industry in the 1980’s (Rosenblum et al 2008). Scientists began studying chronic pain and its
social costs, which include inability to perform responsibilities at home, work, and school, social isolation, poor sleep habits, and frequent health care utilization, all contributing to loss of economic and social productivity (Rosenblum et al 2008). The medical community clamored for treatment options (Rosenblum et al 2008). Beginning in the 1980’s, providers interested in searching for solutions to chronic pain were influenced by several seminal studies on opioid use and abuse.

Several groundbreaking studies proposed opioids as the solution to chronic pain, beginning in 1980 when researchers Jane Porter and Dr. Hershel Jick published a five sentence letter in the New England Journal of Medicine announcing that their analysis of over eleven thousand hospital patients treated with opioids found only four cases of addiction (Jick and Porter 1980). They concluded that “the development of addiction is rare in medical patients with no history of addiction” (Jick and Porter 1980). In 1986, Dr. Russel Portenoy, a highly influential pain management specialist who was particularly vocal about the need for opioids in chronic pain management practices, and his associate Kathleen Foley published a study reporting low instances of opioid addiction among small groups of patients with cancer and other serious illnesses (Sarpatwari et al 2017). However, they hadn’t performed any long-term controlled studies of opioids for chronic pain; their work focused on using opioids to treat acute pain in surgical, burn, and cancer patients (Sarpatwari et al 2017). Yet Portenoy and Foley suggested that active involvement of a physician alone was enough to ensure successful treatment (Portenoy 1986). Portenoy personally declared that the risk of addiction to opioids was a medical myth and called the lack of pain treatment in hospitals “absolutely medieval” (Sarpatwari et al 2017). He suggested that opioids could and should be used for long periods of time with few side effects, and that abuse and addiction concerns were no more than “medical myth” (Keefe 2017).
These influential articles provided evidence not only for physicians to change their prescribing habits, but created a feedback cycle in which other academic works cited these articles to further their conclusions downplaying the risk of opioid addiction, which were then cited in further studies as evidence that opioid use for chronic pain management was safer than we now know it to be. Many influential experimental designs were misaligned with the goal of determining the long term risks of opioid addiction, leading to an overconfidence in the safety of opioids that continues to haunt the medical community decades later. A 2017 review of the citations of the Porter and Jick letter in later New England Journal of Medicine articles revealed that the letter had been cited 608 times, with roughly seventy two percent of authors using it as evidence that addiction was rare in patients treated with opioids and eighty percent of authors failing to accurately explain the terms of the study (Leung et al 2017).

In 1990, Ronald Melzack published an influential article advocating for increased attention from the medical community to chronic pain, citing the Portenoy and Foley (1986) as well as the Porter and Jick (1980) to report that morphine use poses little risk of addiction when properly managed. Drawing on the “strength” of his study and similar studies, the American Pain Society introduced the “Pain as the Fifth Vital Sign” campaign in 1995, urging healthcare professionals to assign to pain the same importance as the other vital signs: blood pressure, temperature, heart rate, and respiration (Rosenblum et al 2008). The campaign encouraged the monitoring of patient’s pain levels during care as a vital indicator of a patient’s condition (Rosenblum et al 2008). The Veterans Affairs system, the Joint Commission on Accreditation of Healthcare Organizers (which accredits hospitals and health care facilities) and the American Academy of Pain Medicine joined the American Pain Society in asking for more aggressive use of prescription opioids for chronic pain patients without cancer (Kolodny et al 2015). The Joint
Commission on Accreditation of Healthcare Organizers created pain management standards that hospitals and outpatient facilities would need to meet for certification, which the VA supported and implemented (Sarpatwari et al 2017). In 1997, American Pain Society and American Academy of Pain Medicine released a joint statement declaring that the risk of opioid addiction for patients without a history of substance abuse was low (Sarpatwari et al 2017). The 2000 best practices guidelines from the American Medical Association’s Council on Scientific Affairs echoed this statement, and the Federation of State Medical Boards declared that using opioid painkillers may be essential in treating chronic pain (Sarpatwari et al 2017). As a result of the push for the use of opioids to treat chronic pain, the use of opioid medications became more common and was encouraged in many clinical guidelines (Rosenblum et al 2008). Much of the blame for the opioid addiction crisis we face today has been levied against the pharmaceutical companies developing and advertising prescription opioid painkillers throughout the 1990’s and 2000’s. But they did not single handedly create today’s opioids addiction crisis, rather, they exploited the medical community’s pre-existing, highly publicized demand for solutions for chronic pain management.

viii: The Beginnings of a Crisis

In 1972, Purdue Pharma developed a formula to slow down the release of a pill’s active ingredient into the bloodstream over several hours. Purdue named it Contin, and first used the extended-release formula with morphine in the drug MS Contin, which became Purdue’s most profitable drug (Sarpatwari et al 2017). Internal documents gathered from the company in the course of various investigations show that when the patent for MS Contin was set to expire, which would permit generics to enter the market and reduce Purdue’s market share and profits, the company began searching for another drug to use Contin on to make its next big
moneymaker (Sarpatwari et al 2017). Purdue decided on oxycodone, which was originally synthesized in Germany in 1916, so the original patent had long expired (Bourdet 2012). There were oxycodone drugs on the market already, like Percocet and Percodan. Purdue added the extended-release Contin formula to pure oxycodone so that the pain killing effects of the oxycodone would be slowly released over a longer period of time, which the company claimed to be twelve hours (Keefe 2017, Ryan et al 2016). They called the extended-release oxycodone drug “OxyContin.” It was different than the oxycodone medications already on the market as it had a higher amount in of oxycodone in each pill to account for the extended time-release (Meier 2017). This made it almost twice as strong as morphine (Keefe 2017). It was granted a patent in 1993, arguably as a result of low standards for patenting as oxycodone wasn’t new, only the extended release properties of OxyContin were (Sarpatwari et al 2017). Purdue now possessed a twenty year period of exclusive manufacturing and selling rights (Foley 2017). The deadline incentivized high levels of marketing during this period of market exclusivity (Sarpatwari et al 2017). The FDA approved the drug in 1995, and OxyContin hit the market in 1996. Purdue began marketing it for long term use for noncancer pain in addition to the more traditional use of opioids to treat acute injury, surgical, and cancer pain.

The game-changing claim Purdue made with OxyContin was that a single dose provided pain relief for twelve hours, twice as long as other painkillers on the market (Sarpatwari et al 2017). Purdue claimed that this was true for over ninety percent of patients (Sarpatwari et al 2017). However, a 2016 Los Angeles Times investigation uncovered that Purdue was aware that these claims were false, upon review of three decades of confidential internal emails, memos, meeting minutes and sales reports, and sworn testimony by executives, sales reps and other employees from court cases and government investigations (Ryan et al 2016). Purdue’s clinical
trial records showed that patients weren’t getting the promised twelve hours of pain relief (Ryan et al 2016). The first clinical trial of OxyContin, designed and overseen by Purdue scientists and paid for by the company as part of the application process for FDA approval, involved ninety women with no history of opioid medication use who were given a dose of OxyContin after gynecological and abdominal surgeries, while control groups were given other short-acting painkillers or placebos. According to a later FDA analysis of the study, more than a third of the women who received OxyContin had pain return within the first eight hours, and half required another dose before twelve hours were up (Ryan et al 2016). But the study went on to claim that OxyContin was “safe, relieved pain and lasted longer than the short-acting painkillers” (Ryan et al 2016). Purdue continually received reports from doctors, sales representatives, and independent researchers that patients weren’t free from pain for twelve hours. Because “OxyContin’s market dominance and its high price — up to hundreds of dollars per bottle — hinge on its 12-hour duration. Without that, it offers little advantage over less expensive painkillers,” the company continued to market the drug on the basis of twice-daily dosing to protect its profits (Ryan et al 2016).

The other major thrust of Purdue’s marketing of OxyContin was the claim that the drug had a risk of addiction of less than one percent (Van Zee 2009). When first released, the OxyContin pills came with a package insert claiming that it was actually safer in this regard than other painkillers (Keefe 2017) as “delayed absorption, as provided by OxyContin® tablets, is believed to reduce the abuse liability of a drug” (Cicero et al 2005). At the time, Purdue had run no clinical studies on the addiction risk of OxyContin (Cicero et al 2005). This claim came from older clinical trials suggesting that, in general, delayed release mechanism drugs were less likely to be abused (Cicero et al 2015). Purdue backed up the claim further with previous unrelated
studies that found low or no rates of addiction among patients treated with opioids, such as Portenoy and Foley (1986) (Cicero et al 2015). But the patients in many of these studies were suffering from acute pain, and were not taking opioids daily for long periods of time to manage chronic pain. Their cases were poor comparisons for evaluating the addiction risk present for the chronic pain patients that Purdue was targeting. A 1999 Purdue-funded study revealed that the rate of addiction in patients taking OxyContin was closer to thirteen percent (Keefe 2017).

To directly market OxyContin to doctors, the company advertised in medical journals, produced splashy promotional videos, and handed out OxyContin-branded merchandise to doctors (Keefe 2017). Purdue doubled its number of sales representatives, who paid personal visits and treated doctors to conferences, dinners, and gifts in exchange for prescribing OxyContin (Ryan et al 2016). Sales representatives were later found to have fabricated phony scientific charts and to have hidden certain findings about the drug’s addictive effects from doctors (Bourdet 2012). Purdue maintained extensive records on the prescribing habits of doctors, with the explicit goal of identifying primary care physicians who would expand the company’s OxyContin prescribing base (United States General Accounting Office 2003). Between 1996 and 2000, the number of Purdue sales representatives grew from 318 to 671, and its physician contact list grew from between 33,400 to 44,500 to between 70,500 to 94,000 (Van Zee 2009). Purdue’s records indicated that by 2003 nearly half of doctors prescribing OxyContin were primary care physicians, who were often not well trained in pain management or addiction detection, and also had less follow-up contact time with patients (Van Zee 2009).

During the first years of OxyContin’s presence on the market, there were no industry or federal guidelines for promoting prescription drugs (United States General Accounting Office
Nonetheless, these advertising methods were so extreme and out of the ordinary at the time that a 2003 investigation by the Drug Enforcement Administration concluded that Purdue’s “aggressive methods” had “very much exacerbated OxyContin’s widespread abuse” (Keefe 2017). Depending on estimates, Purdue spent six to twelve times more on marketing OxyContin than competitor Janssen Pharmaceuticals spent on marketing a competing fentanyl medication (Sarpatwari et al. 2017).

In addition to marketing directly to doctors, Purdue launched more than twenty thousand advertising campaigns for the long term use of prescription opioids for noncancer pain between 1996 and 2002 (Kolodny et al. 2015). The company threw financial support behind organizations like the American Pain Society, the American Academy of Pain Medicine, the Federation of State Medical Boards, and the Joint Commission on Accreditation of Healthcare Organizers in exchange for the organizations’ continued advocacy for the treatment of pain using prescription opioids (Kolodny et al. 2015). The medical community became overenthusiastic in prescribing opioids, in some ways understandably. Prescription opioids offered an attractive solution to the complicated problem of chronic pain. There were (and still are) few non-pharmaceutical approaches to managing chronic pain, and even fewer non-pharmaceutical approaches that health insurance companies were willing to cover (Meldrum 2016).

By 2001, OxyContin was the most frequently prescribed brand-name opioid in the United States for treating moderate to severe pain, even though it was never clinically shown to be a more effective medication than other opioid painkillers (Van Zee 2009). OxyContin became

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¹ As of 2003, there are voluntary guidelines for how drug companies should market and promote their products to federal healthcare programs and to healthcare professionals from Pharmaceutical Research and Manufacturers of America (PhRMA) and the Department of Health and Human Service's Office of Inspector General (United States General Accounting Office 2003).
Purdue’s main product, accounting for ninety percent of the company’s total prescription drug sales by 2001 (United States General Accounting Office 2003):

Table 2: OxyContin Sales, 1996-2002

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales</th>
<th>Percentage increase</th>
<th>Number of prescriptions</th>
<th>Percentage increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>$44,790,000</td>
<td>N/A</td>
<td>316,786</td>
<td>N/A</td>
</tr>
<tr>
<td>1997</td>
<td>125,464,000</td>
<td>180</td>
<td>924,375</td>
<td>192</td>
</tr>
<tr>
<td>1998</td>
<td>286,486,000</td>
<td>128</td>
<td>1,910,944</td>
<td>107</td>
</tr>
<tr>
<td>1999</td>
<td>555,239,000</td>
<td>94</td>
<td>3,504,827</td>
<td>83</td>
</tr>
<tr>
<td>2000</td>
<td>981,643,000</td>
<td>77</td>
<td>5,932,981</td>
<td>69</td>
</tr>
<tr>
<td>2001</td>
<td>1,354,717,000</td>
<td>38</td>
<td>7,183,327</td>
<td>21</td>
</tr>
<tr>
<td>2002</td>
<td>1,536,816,000</td>
<td>13</td>
<td>7,234,204</td>
<td>7</td>
</tr>
</tbody>
</table>

United States General Accounting Office 2003

The popularity of all opioid medications grew beginning in the late 1990’s. Sales of prescription opioid medications including Vicodin, Percocet, and OxyContin quadrupled between 1999 and 2010 (Gounder 2013). Between 2000 and 2009, the number of opioid prescriptions per one hundred persons rose from nearly sixty two to nearly eighty four, an increase of over thirty five percent (Kenan et al 2012). In addition to the increase in the number of prescriptions in this period, the size of the prescriptions for oxycodone and hydrocodone also increased drastically (Kenan et al 2012). If patients taking OxyContin complained of pain breakthroughs closer to eight hours than the Purdue-recommended twelve hours, prescribers were told to prescribe stronger rather than more frequent doses to manage both their pain (Ryan et al 2016). This pattern of extreme highs and extreme lows inherent in stronger dosing greatly increased the patient’s risk for addiction, especially when taking the drug for long periods of time (Sprouse-Blume et al 2010; Kolodny et al 2015).
King et al (2014) identified five ways in which the behavior of prescribers may have contributed to increases in opioid related mortality: prescribing large quantities of opioids, prescribing high doses of opioids, prescribing oxycodone medications specifically (recall that OxyContin is oxycodone), prescribing methadone, and prescribing at high volumes (King et al 2014). Prescribing habits have larger ripple effects within communities than affecting just the individual patients. OxyContin developed a reputation as an easy to get, easy to use recreational drug. As prescription medications are viewed as safe and legitimate, and lack the stigma of illegal drugs, individuals may be more likely to be experimenting with recreational drug use with prescription drugs (King et al 2014). As opioid prescribing for pain management became more commonplace, many people had increased opportunities to view and understand the effectiveness of the prescription drugs from friends and family members (Keyes et al 2014). Many recreational users were first exposed to OxyContin or other painkillers by stealing from friends or family members, which is the most common form of diversion of opioid medications (Volkow et al 2016; Keyes et al 2014). Individuals who have never received a prescription for a prescription opioid account for a substantial proportion of overdose deaths and emergency department visits (Keyes et al 2014).

Anyone interested in taking OxyContin recreationally could learn how to do so just by reading the instruction manual, which warned that “taking broken, chewed or crushed OxyContin tablets could lead to the rapid release and absorption of a potentially toxic dose” (Keefe 2017). To break down the extended-release mechanism of the pill and deliver a huge high all at once, the pills could be crushed into a powder for snorting, or dissolved in liquid for injection (Keefe 2017). The FDA later claimed that it did not realize that these methods could break the extended-
release mechanisms of the pills, or that these forms of misuse would be become widespread (United States General Accounting Office 2003).

As the popularity of recreational use of the drug grew, a black market developed, aided by “pill mills,” high-volume clinics (Keyes et al 2014) operated by medical professionals with varying degrees of licensure to make a profit solely off of prescribing opioids (Keefe 2017). These prescribers were willing to offer opioid prescriptions without much patient contact, making them the perfect targets for “doctor shopping” either for resale or for personal use, in which the same individual obtains multiple prescriptions, each from a different doctor who is unaware of the existence of the others (Volkow et al 2016).

Increasing trends of recreational use, illicit prescribing, and diversion of opioids failed to turn up in the FDA systems responsible for monitoring nationwide use and suspected abuse of drugs. At the same time, the FDA was realizing independently of the opioid problem that these systems weren’t strong enough to detect isolated adverse events before they evolved into large scale public health problems (Cicero et al 2005). Between 1993 and 2001, drug recalls increased dramatically: over one and half percent of drugs approved between 1993 and 1996, and over five percent of drugs approved between 1997 and 2001 were recalled (Cicero et al 2005). In response, the FDA implemented a task force in 1999, which concluded that the monitoring systems weren’t actually able to identify patterns of misuse and diversion (Cicero et al 2005). Just before and throughout the heavy marketing campaign for OxyContin, the FDA was realizing that its safety systems didn’t work to identify drugs being misused - just at the moment the country needed those safeguards the most. By the late 1990’s and early 2000’s, media reports of OxyContin abuse nationwide were growing (Cicero et al 2005), first in the rural areas and the
larger cities particularly in Maine, Kentucky, Ohio, Pennsylvania, Virginia, and West Virginia (United States General Accounting Office 2003).

ix: Backlash

Under public and government pressure to stem off the flow of opioid misuse and addiction, Purdue redesigned OxyContin to make the pills more difficult to crush or dissolve, theoretically discouraging abuse through inhalation and injection (Cicero et al 2012). The new abuse-deterrent pills were released in 2010. If someone managed to crush one of these pills, it would form a thick gel that couldn’t be snorted or injected, but this didn’t guarantee that people wouldn’t abuse the pills simply by taking lots orally at once (Castillo 2013). This redesign might have seemed like an altruistic attempt by Purdue to curb a problem that it was responsible for, but it could also be seen as a profit-motivated decision. The patent on the original formula that made up OxyContin was going to expire in April of 2013, meaning generic extended-release oxycodone could be sold, which would threaten the market dominance of OxyContin and therefore Purdue’s profits. Generally speaking, the loss of a drug’s patent is associated with a reduction in its earning power of approximately eighty to ninety percent (Institute for Health and Socio-Economic Policy 2016) Patent expirations between 2009 to 2014 reduced pharmaceutical companies’ profits by an estimated $120 billion (Institute for Health and Socio-Economic Policy 2016).

Once Purdue obtained a patent on the new abuse-deterrent formula for OxyContin and received FDA approval in 2010, the drug’s earning power was protected until 2025 (Bourdet 2012). The company then stopped producing the original version of the drug. In an ironic twist, they filed a petition with the FDA asking that it reject future applications for companies hoping to produce generic extended-release oxycodone due to the now-apparent high risk of addiction.
inherent in this medication (Bourdet 2012). Purdue had already known that OxyContin was highly addictive for nearly a decade, and lied to the government, the public, and providers about it. Nonetheless, the FDA agreed to block generic forms of OxyContin from the market, a decision that ten generic drug manufacturers have sued over (Bourdet 2012). While these lawsuits proceed, OxyContin keeps its market dominance for extended-release oxycodone, and Purdue continues to make money off of the crisis it helped create (Sarpatwari et al 2017).

x. The Rise of Heroin

There is evidence that the release of the abuse-deterrent OxyContin resulted in a sharp decrease in the abuse of OxyContin (Cicero et al 2014). In a 2009-2012 survey of prescription opioid addicted patients, those who abused both formulations of OxyContin unanimously preferred the original version (Compton et al 2016). But there is also evidence that release of the new formula of OxyContin contributed to an increase in heroin abuse (Compton et al 2016). One study found that the decrease in the rate of OxyContin abuse was associated with an increase in the rate of heroin use in the two years after the introduction of the abuse-deterrent formulation, and three and a half years out from its introduction, the rates of OxyContin abuse leveled off while rates of heroin use continued to increase (Compton et al 2016).

Throughout the 1990’s and 2000’s, heroin and prescription opioid use and abuse were both on the rise (Keyes et al 2014). Beginning in 2006 and 2007, U.S. poison control centers and national health surveys began reporting increased instances of heroin use and addiction (Compton et al 2016). The rate of hospitalizations for heroin overdoses increased sharply between 1993 and 2009, alongside increases in the rate of hospitalizations for prescription opioid overdoses (Compton et al 2016). In 2010, eight percent of drug overdose deaths involved heroin, and by 2015, the figure was twenty five percent (Hedegaard et al 2017):
The timing of the increase in heroin use even before the abuse-deterrent formula of OxyContin was released in 2010 makes it unlikely that the introduction of the new OxyContin pills directly caused an increase in heroin addiction and overdose rates. But it contributed to a replacement effect of other opioid medications and heroin as it reduced the ability of recreational users to abuse of OxyContin and made the drug less desirable for legal or black market sales and purchases (Cicero et al 2012). The black market price for OxyContin pills dropped from seventy three cents per milligram for the old pills to fifty two cents for the new abuse-deterrent pills (Eban 2011). As heroin is pharmacologically similar to prescription opioids, some users switch from using prescription opioid abuse to heroin (Compton et al 2016).

There are consistent findings of a positive association between heroin abuse and prescription opioid abuse (Compton et al 2016). Studies have found that heroin users are more likely to report nonmedical use of opioids and opioid addiction than non-heroin users (Compton et al 2016). Recreational prescription opioid users are more likely than nonusers to transition to using heroin and other illegal drugs (Keyes et al 2014; Compton et al 2016). Studies analyzing patterns of opioid abuse suggest that:

Persons most often start with oral nonmedical use of opioids. They move to more efficient routes of administration, such as insufflation, smoking, or injection, as tolerance
to opioids develops and it becomes more costly to maintain their abuse patterns. By the time they initiate heroin use, usually through contact with drug users, sexual partners, or drug dealers, they view heroin as reliably available, more potent, easier to manipulate for non-oral routes, and more cost-effective than prescription opioids (Compton et al 2016).

In a 2014 survey of individuals entering substance abuse treatment, eighty percent of those who reported first using opioids in the 1960’s indicated that heroin was their their first opioid. In contrast, seventy five percent of those who reported first using in the 2000’s indicated that their first opioid was a prescription opioid (Cicero et al 2014). Twenty four percent of opioid users in one survey reported finding a way around the tamper-resistant properties of the abuse-deterrent formulation, and sixty six percent indicated a switch to another opioid, with “heroin” as the most common replacement drug reported (Cicero 2012).

Most respondents indicated that heroin was the drug they began using because it was now easier to use, cheaper, and more widely accessible (Compton et al 2016). Throughout the 2000’s, the price of heroin dropped drastically and the drug was becoming more widely distributed across to more geographic areas of the country (Compton et al 2016). In comparison with the new OxyContin pills, heroin was cheaper and easier to find, as its retail price per gram of heroin has been dropping since the early 1980s (Compton et al 2016). One study indicates that a one hundred dollar decrease in the price per pure gram of heroin resulted in a nearly three percent increase in the number of hospitalizations for heroin overdose (Compton et al 2016).

**xi: Where Do We Go From Here?**

While some studies that report that only a small percentage of prescription opioid users and abusers begin using heroin in the first place (Compton et al 2016; Botticelli 2015), overall there is a consensus that the increase in heroin use was “unintended byproduct of efforts to crackdown on painkiller abuse that didn’t include treatment of the underlying addiction” (Wilson 2014). A Substance Abuse and Mental Health Services Administration (SAMHSA) study
indicated that less than four percent of nonmedical prescription opioid users transitioned to heroin use in the first place, but eighty percent of new heroin users reported previous nonmedical prescription use (Muhuri, Gfroerer, and Davies 2013). The prevalence of prescription opioids and heroin has led to an addiction and overdose crisis the likes of which America has never seen before. Between 1999 and 2014, 165,000 Americans died from prescription-opioid overdoses (Kano 2016). Overall drug overdoses increased 137% between 2000 and 2014, during which overdoses involving specifically prescription opioids and heroin increased 200% (Meldrum 2016). In 2006, Americans consumed more than twice as many kilograms of opioids as in 1997 (King et al 2014). The number of patients admitted to substance abuse treatment facilities for prescription opioid abuse quadrupled from 23,000 in 1999 to more than 90,000 in 2007 (Birnbaum et al 2011). In 2008 drug overdoses overtook car accidents as the leading cause of accidental death in America and have stayed in the top spot since, with opioid overdoses accounting for the largest share of fatal overdoses (Quinones 2015). In 2012 alone, 259 million prescriptions were written for opioids, more than enough to give every American adult a bottle of pills (Harris et al 2016). In that year, twelve states had more opioid prescriptions written than people living in them (Nolan and Amico 2016). In 2014, the CDC began listing opioid overdose prevention as one of the top five public health challenges facing the country (Kolodny et al 2015).

The crisis has created great economic costs that put rising pressure on federal and state finances and economies. One estimate of the total societal costs of prescription opioid abuse estimated the costs at $55.7 billion, with lost workplace productivity accounting for $25.6 billion, healthcare costs $25 billion, and criminal justice costs $5.1 billion (Birnbaum et al 2011). Of the $25.6 billion in workplace costs, the cost of premature deaths due to overdose or related
health issues accounts for $11.2 billion (Birnbaum et al 2011). Of healthcare costs, substance abuse treatment accounted for $1.1 billion, prevention for $85 million, and research for $69 million (Birnbaum et al 2011). The difference between overall societal costs and spending on research and prevention was substantial, with these expenditures only accounting for less than one percent of total societal costs (Birnbaum et al 2011). These figures likely understate the true economic burden of prescription opioid abuse (Birnbaum et al 2011). The opioid crisis has become a puzzle of how to reduce prescription opioid abuse without unintentionally causing shifts to heroin abuse instead. State policy responses must fight a battle against the opioid epidemic on two fronts: first, to limit the public’s access to powerful prescription opioids while maintaining access for people with legitimate pain management needs; and second, to treat those who are already addicted to opioids.
Chapter II: Examining Variation in Policy Responses to the Opioid Crisis Across the New England States

This chapter will first define and explain the details of six key policies in general terms on the national scale, in order to contextualize the existence of these policies nationwide. I will then move into specific comparisons of their implementation in the six New England states.

i. Continuing Medical Education

Pain management is considered a medical specialty, meaning primary care physicians often receive less formal training in managing pain (Fink-Miller et al. 2014). The lack of training on pain management is problematic considering primary care doctors are typically the provider that patients encounter first when first seeking treatment for their chronic pain (Fink-Miller et al. 2014). In 2010, almost twenty percent of physician office visits where non-cancer pain was either a primary symptom or diagnosis resulted in a prescription for opioid painkillers (Daubresse et al. 2013). Fox et al. (2012) argues that primary care doctors who feel poorly prepared to treat chronic pain patients may rely too heavily on opioids as a primary treatment option, and inadequately monitor patients with opioid prescriptions for signs of addiction and diversion. On the contrary, survey evidence from primary care doctors indicates a lack of confidence in their training and ability to manage pain and prescribe opioids (Simon 2012, Fink-Miller 2014, Fox 2012, Davis and Carr 2016). Survey responses also indicate that primary care doctors lack of confidence in their pain management training and fear medication misuse and the risk of addiction (Simon 2012, Fink-Miller 2014, Fox et al. 2012, Davis and Carr 2016).

Pain management receives insufficient and fragmented attention during medical school and residency programs (Simon 2012). A National Institute of Health funded report on the subject declares that throughout the medical education system, pain is still treated as a symptom
and not something that requires direct treatment. The same report found discrepancies in how pain is taught in different medical schools, among departments in the same medical school, and even within departments in the same medical school (Simon 2012). As most physicians received little or no training during medical school regarding evidence-based prescribing, substance abuse disorders, and pain management, some states are turning to requiring these topics to be covered in certain numbers of hours continuing medical education (CME) courses, which are courses that doctors must take throughout their careers to meet certain licensing requirements (Davis and Carr 2016), in an attempt to reduce diversion of prescription opioids.

While many of these requirements are fairly new, theoretically, requiring physicians to obtain CME credits on opioid prescribing and pain management may help reduce over-prescribing of opioids and eventually decrease opioid-related death rates (Simon 2012). Some states may require all or nearly all physicians to obtain CME on pain management and controlled substance prescribing, but others may only require doctors who are licensed to prescribe and/or actually do prescribe controlled substances to complete CME on pain management and controlled substance prescribing. While including few hours of CME infrequently is not likely to be sufficient enough to fully counterbalance the lack of standardized medical school curricula or residency training in pain management and opioid prescribing, studies of the impacts of CME training initiatives have shown positive effects on provider knowledge and patient outcomes (Simon 2012).

ii. Opioid Prescribing Guidelines and Regulations

Prescribing guidelines exist to help physicians make informed choices about treatment. Opioid prescribing guidelines provide recommendations for pain treatment based on what the medical field now knows about risks and rewards of using opioids to treat pain (National Safety
Council 2016). The goal is to provide an updated guideline for assessing pain management to determine if opioids have been used and/or will be used in the future properly in a way that is medically appropriate, and complies with state and federal laws and regulations (Rhyne et al 2013). These guidelines are not necessarily legally binding, and are usually only voluntary rules issued by state medical boards that physicians are encouraged to consider when prescribing opioids. State regulations require prescribers and dispensers to adhere to specific laws regarding how often, how many, and in what circumstances opioid medications can be prescribed and dispensed for patients. Meara et al (2016) found that at the national level, prevalence of state restrictions governing opioid prescribing and dispensing flourished between 2006 and 2012. Collectively, states added 81 controlled-substance laws in this period (Meara et al 2016). By 2012, all states had at least one type of law regulating the prescribing of opioids (Meara et al 2016).

### iii. Eliminating Pill Mills

The term “pill mills” colloquially refers to clinics that prescribe controlled medications more frequently than standard medical practice dictates (National Safety Council 2016). A pill mill refers to a fully licensed physician with valid prescribing authority from the DEA who is writing aggressively large quantities of prescriptions and serving a wide geographic area (Betses and Brennan 2013). Pill mills are easy targets for for “doctor shopping” in which individuals fill prescriptions from multiple prescribers. A pill mill can be a standalone pain management clinic, or an individual prescriber operating within a larger practice’s office or healthcare facility that also legitimately treats varied medical conditions. Pain management clinics, which are defined as prescribing controlled substances to a majority (fifty one percent) of patients for the treatment of chronic pain, are not inherently pill mills (Garcia 2013). Some characteristics that distinguish a
“pill mill” from a legitimate pain management practice include: nonexistent or cursory patient exams (Garcia 2013), handling a large daily volume of patients (Garcia 2013), not being owned by a licensed health care provider (Garcia 2013), only accepting payment in cash, (Garcia 2013; Rigg, March, and Inciari 2010), prescribing identical medication regimes to each patient (Garcia 2013, National Safety Council 2016), utilizing onsite dispensing (Garcia 2013), using a single facility for all patients’ magnetic resonance images (Garcia 2013), not using diagnostic approaches to pain management (National Safety Council 2016), and not referring patients to appropriate specialists (National Safety Council 2016). Many of these warning signs can also correspond to legitimate practices, such as hospitals, hospice programs, medical schools or training institutions, and ambulatory surgery facilities (Garcia 2013). It is therefore difficult for pharmacists and prescribers to recognize patterns of illegal prescribing or doctor shopping. Because patients will have a legal prescription from a fully licensed doctor, there is potentially no way for other providers, dispensers, and even law enforcement to ascertain which doctors are potentially abusing their prescribing abilities (Betses and Brennan 2013).

Pill mills do not exist in all states, but since most states have no specific legislation prohibiting their existence, those that do are often legally permitted to exist even as the prescribing habits of doctors are questionable at best and illegal and dangerous at worst. Many states with severe pill mill problems, like Florida, now have specific legislation against pill mills or making regulations for legitimate pain management clinics stricter. Legislation with this goal in mind may include state oversight of pain management clinics through registration or licensure, requiring state inspection of the facilities, and requirements that such practices be owned by a licensed physician who meets specific education and training criteria in pain management (Garcia 2013). But in many states that never had many pill mills in the first place, like in the
New England region, there is still no specific legislation prohibiting or regulating any hypothetical clinics that might open in the future (National Safety Council 2016). The implementation of these laws is controversial. There are concerns that to avoid registering as a pain management clinic and being subject to regulations, providers could limit prescribing of controlled substances to treat pain to just under fifty one percent of their patients to avoid state scrutiny (Garcia 2013). It is also possible that by introducing increased regulation of pain treatment using prescription opioids, patients with legitimate medical needs for these medications to treat their pain may not be able to access care as doctors become wary of breaking the rules, fearful of criminal prosecution (Garcia 2013).

iv. Prescription Drug Monitoring Programs

At least two out of three people who died of an opioid-related overdose between 2011 and 2014 had an opioid prescription during those years (Hopkins and Johnson 2017). However, only eight percent of people who died from an opioid overdose had legal access to prescription opioids through a prescription during the specific month of their death (Hopkins and Johnson 2017). To counteract illegitimate access to prescription opioids, many states have begun tracking legal access to opioids via prescriptions and devising methods of detecting on illegal diversion of legally obtained opioids, such as Prescription Drug Monitoring Programs (PDMPs) which are databases that track individual prescriptions, including patient names, dates and the amounts prescribed by which doctor in order to flag suspicious activity on behalf of patients and doctors. These databases are not only used for opioids, but for a variety of controlled substances, depending on the state. Forty nine states have PDMPs, and not all have the same requirements for provider and dispenser reporting (Hopkins and Johnson 2017). General points of variation include requiring different schedules of drugs to be reported to the database, housing the
database in different state agencies, requiring different types of prescribers and dispensers to report data, who has access to the database itself and its data, deciding how often data must be reported (i.e., monthly, weekly, or in real time), and whether data can be shared with other states (Garcia 2013). But all have the same prerogative: collect data on the physician who wrote the prescription, the pharmacies that dispense the medication, and the patient’s medication history.

By using a patient’s searchable prescription history in the system, a provider can improve the safety of the patient’s drug regimen and coordinate care to ensure all providers are on the same page when it comes to the patient’s treatment (Massachusetts Department of Public Health, n.d.). The data also can lead to identification of potential illegal prescription drug misuse, abuse, and diversion (Massachusetts Department of Public Health, n.d.). PDMPs serve as a central repository for this data, and each state has different rules for which authorities and agencies can access the data and how (Grill 2013). Analyzing PDMP data can been crucial in reducing instances when patients obtain multiple prescriptions from different providers (doctor shopping) or have the same prescription filled multiple times at different pharmacies (Massachusetts Department of Public Health 2016). Individuals filling prescriptions from three or more prescribers within a three month period are at a risk of a fatal opioid overdose that is seven times higher than that of those with just one or two prescribers (Hopkins and Johnson 2017). PDMP data can also provide patient prescription history information to pharmacies and healthcare providers, shape educational outreach efforts to health care providers and the public, and provide law enforcement agencies with information necessary to build cases on illegal drug distribution (Massachusetts Department of Public Health 2016).

When writing a prescription for an opioid (or other substance if required by state law), the prescribing doctor will be required to enter in the prescribing information into the PDMP.
When the patient goes to have their prescription refilled, if state regulations require it or if the pharmacist has reason to suspicious of the patient’s prescription or has personal knowledge of past problems for this patient with prescriptions, the pharmacist may check the patient’s PDMP profile before dispensing the medication. After dispensing the medication, the pharmacist will enter in the information into the PDMP, which the prescriber will be able to see at the next check for that particular patient. Checks may be mandatory or simply encouraged depending on the state (Grill 2013).

PDMPs provide valuable information on the prescribing habits of providers, but are potentially missing out on the whole picture of the presence of opioids in the state. Prescription drugs that are obtained illegally through theft or street dealing are potentially significant contributors to the totality of the opioid overdose epidemic, but will not be captured by a PDMP history. A filled prescription does not necessarily indicate that the recipient took all or even any of the medication (Massachusetts Department of Public Health 2016). The use of altogether illegal opioids (i.e., heroin) will not be captured in a PDMP. Additionally, not every state requires all types of medical professionals who may be prescribing opioids to register with the PDMP or requires checks of the PDMP at specific times, meaning that PDMPs may be limited in tracking prescriptions and prescribers or pharmacists may not check the PDMP regularly.

The usefulness of PDMPs to combat the opioid epidemic has been studied extensively. Patrick et al (2016) studied whether if simply the implementation of a PDMP reduces opioid overdose deaths, or if PDMPs must have certain characteristics to be effective in reducing opioid overdose deaths. The study found that the implementation of a PDMP was associated with an average reduction of 1.12 in opioid-related overdose deaths per 100,000 population in the year after implementation, and that states with “stronger” PDMPs, meaning those monitoring more
types of drugs or updating data more frequently, had greater reductions in opioid overdose deaths in comparison to states with “weaker” programs. Bao et al (2016) found that the implementation of a prescription drug monitoring program was associated with more than a thirty percent reduction in the rate of prescribing of opioids in the first three years after implementation of a PDMP. Reifler et al (2012) found an association between PDMPs and decreasing opioid abuse trends from 2003 to 2009.

v. Naloxone Availability

The overdose reversal medication naloxone, while not a controlled substance and not a drug with a risk of abuse, requires a prescription, which can be a barrier to access. Prescribers may prescribe naloxone to patients that they suspect or know to be abusing opioids, or in conjunction with a prescription for opioid medications, but this practice is still relatively uncommon. Legal barriers have previously existed to the widespread access to naloxone, even in emergency medical care. Whether naloxone can successfully revive someone in the throes of an overdose depends on the timeliness of its administration. Death from overdose typically occurs within one to three hours, although earlier in some cases (Kim, Irwin, and Khoshnood 2009) One dose of naloxone lasts in the body between thirty minutes and one hour (Lopez 2017). This short window of time gives the body the opportunity to metabolize more of the opioid, bringing someone out of danger of overdosing again after the window of action of naloxone is up (Lopez 2017). While all states permit paramedics to administer naloxone, not all emergency services have paramedics and those that do may only have a small number. Especially in rural areas, EMTs may be the only first responders available, and in these rural areas transport times to hospitals are often long. EMTs outnumber paramedics three to one nationwide (Davis et al 2014), but EMTs have less training than paramedics and are restricted from performing many of
the techniques or administering drugs that paramedics can - including naloxone, up until recently. Allowing EMTs to administer naloxone has been demonstrated to reduce time between overdose to naloxone, and as overdoses become more common in a service area, can free up paramedics to respond to other emergencies that might require more intensive paramedic-level treatment (Davis et al 2014).

Between sixty five and ninety seven percent of those who misuse drugs have reported witnessing an overdose (Kim, Irwin, and Khoshnood 2009). But many of these witnesses are loathe to call 911, which is often perceived as a last resort, occurring only an estimated ten to fifty six percent of the time, because police are typically notified of an overdose report to 911 and will appear at the scene of the emergency (Kim, Irwin, and Khoshnood 2009). People who witness an overdose often likely fear being charged for possession of illegal drugs, illegal use of legal drugs, or other crimes (Davis et al 2017). Bystanders can be arrested for drug possession and even charged with murder if police suspect that they were responsible for supplying the drugs to the victim of a fatal overdose (Hawk, Vaca, and D’Onofrio 2015). Because opioid overdose often occurs when the victim is with associates, friends, and family, these are the individuals who are often in the best position to administer naloxone. Logistically speaking, naloxone can be administered by a person with no advanced medical training. But many bystanders will not have it accessible. State practice laws generally prohibit the prescription of medications to third parties, or people other than the individuals who will be taking the drug, and also typically prohibit prescriptions being given as standing orders, meaning to individuals who are not patients of the prescribers. Prescribers are often concerned about exposing themselves to potential liability when prescribing naloxone both to individuals at risk of overdose, and to non-patients in these situations, but there is little legal basis for these concerns.
Improving access to naloxone requires making exceptions to prescribing regulations to allow more citizens to get naloxone prescribed and dispensed to them, and allow their use of the drug without fear of legal retribution. The National Bureau of Economic Research found that the adoption of a naloxone access law is associated with a nine to eleven percent decrease in the opioid-related deaths in a state, and that Good Samaritan laws for overdose victims who get treated and for witnesses calling for help were associated with a similar though not statistically significant reduction. While there are some who argue against making naloxone more accessible on the grounds that it could encourage more frequent or higher-volume drug use if users perceive it as a safety net. But surveys of opioid users have demonstrated that the majority of respondents do not see naloxone this way (Kim, Irwin, and Khoshnood 2009). These laws have not been found to be associated with an increase in non-medical use of prescription painkillers (Davis et al 2017). While naloxone saves lives, it is not in a pleasant way. The administration of naloxone reverses an overdose, but in doing so, forces the body into the withdrawal symptoms that those who are addicted to opioids continue taking drugs to prevent, but the withdrawal symptoms are more intense than they would be with just natural withdrawal (Kim, Irwin, and Khoshnood 2009).
Table 3: Summary of Naloxone Availability Policies

<table>
<thead>
<tr>
<th>Policy Type</th>
<th>What Does it Mean?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permit prescriptions to third parties</td>
<td>Someone who isn’t personally at risk of overdosing can receive a prescription for Naloxone from a doctor and get it filled.</td>
</tr>
<tr>
<td>Permit dispensing by standing order</td>
<td>A physician can write an order that says naloxone can be distributed by other health care workers who fulfill specified conditions. For example, if a pharmacist is to distribute the naloxone, someone could receive naloxone without ever seeing the doctor who officially prescribed it.</td>
</tr>
<tr>
<td>Provide criminal, civil and professional immunity to prescribers, dispensers, and administrators</td>
<td>Those who prescribe, dispense, or administer naloxone cannot be prosecuted, sued, or professionally disciplined for doing so.</td>
</tr>
<tr>
<td>Permit lay dispensing and administration</td>
<td>Allows lay people to possess naloxone and administer with and/or without a prescription, depending on the state.</td>
</tr>
<tr>
<td>Good Samaritans protections for people reporting overdoses</td>
<td>Provides limited criminal immunity to a witness calling for help in event of overdose emergency, and to the overdose victim</td>
</tr>
<tr>
<td>Expanding what types of first responders can administer naloxone</td>
<td>EMTs, law enforcement, and firefighters can administer naloxone.</td>
</tr>
</tbody>
</table>

*Davis 2015*

vi. Medication-Assisted Treatment (MAT)

The use of medications, in addition to counseling and participation in social support programs, to treat opioid addiction is referred to as “medication-assisted treatment” or MAT (SAMHSA 2015). MAT is officially defined by SAMHSA as “the use of medications, in combination with counseling and behavioral therapies, to provide a whole-patient approach to the treatment of substance use disorders.” (Letendre et al 2016; 8). Three medications have been approved by the FDA for MAT: methadone, buprenorphine, and naltrexone (Letendre et al 2016). These medications relieve craving for the abused opioid, block the effects of the abused...
opioid, and relieve withdrawal symptoms (Joseph, Stancliff, and Langrod 2000). Buprenorphine and methadone are opioids, and naltrexone is a non-opioid. In comparison to the rapid onset and short duration of action of other opioids on the brain, buprenorphine and methadone have a slower, more gradual process of affecting the opioid receptors in the brain (National Institute on Drug Abuse 2018). This prevents the appearance of physically uncomfortable withdrawal symptoms and reduces cravings (Jones 2004).

Since 1986, U.S. spending on inpatient substance abuse treatment has decreased dramatically, while spending on outpatient and residential treatment has increased (Urahn et al 2015). One aspect of the shift from inpatient to outpatient treatment has been the increased use of medication-assisted treatment (MAT) using buprenorphine and methadone, driven by the increase in opioid addiction and in the development of buprenorphine (Urahn et al 2015). Between 1986 and 2003, a negligible portion of treatment spending was directed toward prescription drugs for MAT. From 2002 to 2012, the percentage of treatment admissions in which opiates were the primary substance of abuse increased from eighteen to twenty six percent (Urahn et al 2015). As of 2009, the most recent year for which data are available, MAT accounted for four percent of all substance use disorder treatment spending (Urahn et al 2015).

MAT has gained popularity in recent years as it has been found to decrease death rates from opioid use, increase time spent in treatment; reduce addiction treatment costs, reduce overdose rates, increase abstinence from using opioids, and the risk of contracting HIV or hepatitis C for patients receiving MAT (Letendre et al 2016). MAT programs designed to offer long-term “maintenance” treatment have been found to be more effective than short-term “detox” programs that seek to manage withdrawal and stop all opioid use cold-turkey within a thirty day window or shorter (Institute for Clinical and Economic Review 2014). MAT is
associated with better treatment program retention rates and lower rates of opioid abuse compared to patients in “detox” withdrawal management programs where the goal is simply cutting out opioid use (Institute for Clinical and Economic Review 2014). Detox program participation is associated with a high relapse rate, and detox has been generally found to be an inadequate treatment for opioid dependence when viewing it as a chronic, recurrent condition (Nyosk et al 2013). MAT without a hard and fast limit on the permissible length of time spent on medication has the greatest likelihood of patients staying in treatment and reducing their risk of dying by overdose (Williams and Bisaga 2016). Also contributing to the popularity of MAT is that economic modeling of MAT options has revealed that the added health care costs of treatment are offset by reductions in other health care costs for individuals with opioid addictions (Institute for Clinical and Economic Review 2014).

Ironically, there is evidence that a high percentage of opioid-related deaths have been caused by methadone, which has traditionally been used for substance abuse treatment (King et al 2014). There is substantial evidence that methadone prescriptions for pain management purposes may have contributed to increased opioid-related mortality (King et al 2014). One U.S. study indicated that methadone was responsible for twice as many single-drug deaths as any other opioid (King et al 2014), and another 2002 study indicated that the varying presence of methadone and oxycodone alone accounted for a large proportion of geographic variation in opioid-related mortality (King et al 2014). Methadone can be prescribed in tablet form for pain by a provider with a DEA registration, as it has pain killing effects on a similar order of magnitude as morphine (Anderson and Kearney 2006). Methadone prescriptions increased during the late 1990’s and 2000’s, potentially due to it its attractive pricing (King et al 2014). As it is a generic medication, private insurers, Medicaid, and individual prescribers may prefer
patients receive methadone instead of a more expensive patent-protected medication like OxyContin (King et al 2014). But to treat addiction, it can only dispensed in a liquid format by a licensed accredited opioid treatment program (OTP), often referred to as a methadone clinic (Letendre et al 2016).

Methadone is a full agonist. It works by fully binding to the opioids receptors until the receptors are all active. This full activation does not provide a high, but eliminates withdrawal symptoms on long-term basis and blocking the effects of other opioids taken (Nyosk et al 2013). But due to this full binding activity, methadone can be addictive and carry a risk of overdose. At an OTP, the patient must take the dose of methadone under direct observation by a provider (Institute for Clinical and Economic Review 2014) because methadone has the greatest potential for abuse and overdose of all the drugs used for MAT. For the same reason, dosing is individually tailored to the patient’s level of physical dependence on opioids (Institute for Clinical and Economic Review 2014). Dosing is fraught, as there is a small difference between a therapeutic and a toxic dose (King et al 2014), requiring close supervision of the patient. While there is concern that methadone used for treatment can be diverted for illegal use by those without prescriptions for the medication, opioid diversion monitoring systems show that the methadone tablets formulated for pain medication purposes only are more likely to be diverted than the oral format of methadone used in MAT or buprenorphine (Noysk et al 2013).

Buprenorphine is a partial agonist, meaning it also binds to opioid receptors, but its stimulating effects are limited. It is less potent than methadone, but its effects can last longer (Mattick et al 2014). This limited impact means that buprenorphine might be best targeted to patients with lower levels of physical dependence on opioids (Institute for Clinical and Economic Review 2014). Buprenorphine binds more tightly to mu receptors than other opioids,
including methadone. So if an individual with buprenorphine in their system takes another opioid, the buprenorphine will block it from reaching the receptors. If an individual who already has an opioid in their system takes buprenorphine, the buprenorphine will replace the other opioid in the receptors (Jones 2004).

Buprenorphine has a ceiling effect, meaning that its effects plateau at a saturation point at which neither its effects nor the effects of a different opiate will increase, even if the user takes more opioids (Addiction Treatment Forum 2013). With this ceiling effect, there is no additional benefit gained by increasing the dose beyond a certain point, depending on the patient’s level of previous opioid use (Institute for Clinical and Economic Review 2014). This ceiling effect makes it less effective than methadone for patients with severe opioid dependency issues, but it also prevents the adverse effects of methadone (Institute for Clinical and Economic Review 2014).

The lesser potency of buprenorphine means it has a lesser chance of abuse than methadone (Mattick et al 2014). Taking more buprenorphine won’t increase the user’s sensations of the drug in their system, but can potentially still cause an overdose if individuals try taking more. The combination of buprenorphine and naloxone, the overdose reversal drug, in Suboxone is safer than a drug containing pure buprenorphine and is therefore most commonly used for buprenorphine based MAT (The National Alliance of Advocates for Buprenorphine Treatment). Pure buprenorphine alone can be used, but is most often prescribed to pregnant women receiving MAT, as naloxone should not be used during pregnancy (Institute for Clinical and Economic Review 2014). Buprenorphine and naloxone combined has a longer half-life (the time it takes for the concentration of the substance in the body to fall by half) than almost all other opioids, meaning that the effects last longer than that of other opioids, allowing for a longer dosing interval (Rosenblum et al 2008), so patients don’t have to take the medication as frequently as
they must report in person to a MAT location to take methadone under supervision. Methadone is administered between one to four times a day, but buprenorphine can be taken once twice a day (Lopez 2017).

Clinical studies of these medications generally find no statistically-significant differences in illicit drug use, criminal activity, or mortality between methadone and buprenorphine treatment (Institute for Clinical and Economic Review 2014). Buprenorphine has a lower risk of overdose and recreational use and abuse, and is easier to access and administer (Garcia-Portilla et al 2014). Methadone treatment is associated with higher rates of treatment retention relative to buprenorphine treatment (Institute for Clinical and Economic Review 2014). Both opioids have both been found to be highly effective in for withdrawal management in the short term and addiction treatment in the long run (Letendre et al 2016).

Because buprenorphine has a lesser chance of being abused and a lesser a risk of overdose (when combined with naloxone) it is available in an-office based setting from a retail pharmacy with a qualified doctor’s prescription, meaning users can take it in their own home on their own time (IMS Institute for Healthcare Infomatics 2016). Methadone has a higher chance of abuse and overdose, and so the drug must be dispensed in a clinical rather than office-based setting (IMS Institute for Healthcare Infomatics 2016) in an OTP. OTPs are treatment facilities certified by SAMHSA and regulated by a diverse group of agencies including the Department of Health and Human Services (HHS), the Drug Enforcement Agency (DEA), and various state agencies (Institute for Clinical and Economic Review 2014).

MAT with buprenorphine offers fewer legal, regulatory, and abuse and diversion issues than MAT with methadone does (Ducharme and Abraham 2008). Rather than an OTP, buprenorphine is accessible through a doctor with a certification. To become certified to prescribe
buprenorphine, doctors must go through eight hours of training sponsored by certified groups like American Academy of Addiction Psychiatry, American Psychiatric Association, and the American Society of Addiction Medicine; and guarantee they have the ability to refer patients for counseling and other services to receive a buprenorphine waiver from the Drug Enforcement Administration (Letendre et al 2016). The waiver allows the doctor to prescribe buprenorphine for no more than thirty patients at any given time during the first year (Polydorou, Gunderson, and Levin 2008).

The doctor can apply to increase to one hundred patients after this first year (Letendre et al 2016). Patients on buprenorphine prescriptions must meet specific criteria for opioid dependence, and follow up with regular office visits in which care is documented extensively and the physician refers the patient for additional counseling and other social services (Letendre et al 2016). Since 2002, more than 12,000 physicians have received a waiver, and more than half are not addiction specialists (Polydorou, Gunderson, and Levin 2008). But simply having a waiver does not mean that doctors will prescribe buprenorphine. Surveys of waived doctors revealed reports of prescriber’s lack of experience in pain management, difficulty starting to prescribe buprenorphine, low reimbursement for prescribing buprenorphine, and low levels of patient compliance, contributing to a reluctance to prescribe buprenorphine (Polydorou, Gunderson, and Levin 2008). One study noted that more than forty percent of physicians with waivers had not treated any patients with buprenorphine. Of those physicians who had prescribed buprenorphine, 25% reported that these challenges caused them to reduce the number of patients they treat or to stop providing buprenorphine treatment (Polydorou, Gunderson, and Levin 2008). Buprenorphine may be a more viable option for patients accessing MAT in rural and
remote areas, which may lack an OTP or patients may lack the means of transportation to travel a long distance to an OTP (Ducharme and Abraham 2008).

Naltrexone is a non-opioid treatment option that has been available since 1994, and primarily used for the treatment of alcohol addiction (Ducharme and Abraham 2008). It is a complete opioid antagonist, meaning it blocks the opioid receptors in the brain from receiving an opioid and producing a high (Institute for Clinical and Economic Review 2014). Because it is not an opioid, it has no risk of addiction or diversion, but it does not control craving for opioids or withdrawal symptoms. To begin taking Naltrexone, individuals must be completely free from any and all opioids for at least seven days which is often a hurdle to beginning the medication (Institute for Clinical and Economic Review 2014). Retention rates for naltrexone treatments are typically low, and the drug has a high rate of relapse (Institute for Clinical and Economic Review 2014). It can be prescribed in an office-based setting by any healthcare provider licensed to prescribe medications, such as nurse practitioners and physicians assistants in addition to physicians. There is no limit on the number of patients a provider may prescribe this medication to (Letendre et al 2016).
### Table 4: Comparisons of Methadone, Buprenorphine, and Naltrexone

<table>
<thead>
<tr>
<th></th>
<th>Methadone</th>
<th>Buprenorphine</th>
<th>Naltrexone</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mechanism of action</strong></td>
<td>Full agonist: Binds to and activates receptors Prevents withdrawal and craving for opioids</td>
<td>Partial agonist: Binds to and partially activates receptors. Prevents withdrawal or craving</td>
<td>Antagonist: Binds to opioid receptors to block the effects of opioids on the receptors.</td>
</tr>
<tr>
<td><strong>Used for</strong></td>
<td>Withdrawal management and treatment for opioid addiction</td>
<td>Withdrawal management and treatment for opioid addiction</td>
<td>Treatment for opioid addiction</td>
</tr>
<tr>
<td><strong>Administered</strong></td>
<td>Multiple times/day</td>
<td>Once a day</td>
<td>Monthly</td>
</tr>
<tr>
<td><strong>Available from</strong></td>
<td>A certified OTP</td>
<td>Any licensed physician with a DEA registration and a buprenorphine waiver</td>
<td>Any healthcare provider who has a license</td>
</tr>
<tr>
<td><strong>Relative Cost</strong></td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td><strong>Overdose Risk</strong></td>
<td>High</td>
<td>Moderate</td>
<td>None</td>
</tr>
<tr>
<td><strong>Diversion Risk</strong></td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>

*Letendre et al 2016*

All states have their own regulations regarding addiction treatment, such as licensure and certification, financing (including disbursement of block grant funds, and setting Medicaid formularies and coverage limitations), and acceptable use of medications (Ducharme and Abraham 2008). Due to or despite state regulations, MAT locations can still be few and far between, inaccessible due to a lack of treatment capacity, and otherwise poorly integrated into the state’s healthcare landscape and disassociated from other services available (Ducharme and Abraham 2008). The vast majority of states have demand for buprenorphine and methadone MAT that far exceeds the available stock of treatment providers and facilities. National rates of opioid abuse or dependence (891.8 per 1,000,000 people) far exceeded the nation’s maximum
buprenorphine treatment capacity (420.3) and number of people receiving methadone at an OTP (119.9) (National Safety Council 2016).

vii. State Comparisons Across Policies

a. State Comparison: Continuing Medical Education

Table 5: State Comparison of Continuing Medical Education Requirements

<table>
<thead>
<tr>
<th>State</th>
<th>Applies to</th>
<th>Prescribing Education</th>
<th>Pain Management Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT</td>
<td>All physicians</td>
<td>1 hour in pain management and controlled substance prescribing every 6 years.</td>
<td>1 hour in pain management and controlled substance prescribing every 6 years.</td>
</tr>
<tr>
<td>ME</td>
<td>Physicians who prescribe controlled substances</td>
<td>3 hours on opioid prescribing every 2 years.</td>
<td>None</td>
</tr>
<tr>
<td>MA</td>
<td>Physicians who prescribe controlled substances</td>
<td>3 credits in opioid education and pain management.</td>
<td>3 credits in opioid education and pain management.</td>
</tr>
<tr>
<td>NH</td>
<td>Physicians who prescribe controlled substances</td>
<td>None</td>
<td>3 hours on pain management and addiction</td>
</tr>
<tr>
<td>RI</td>
<td>All physicians</td>
<td>None</td>
<td>None - of the 40 hours required every 2 years, 2 hours is required to be in certain categories, including pain management, but doctors could choose to not complete this category.</td>
</tr>
<tr>
<td>VT</td>
<td>Physicians who prescribe controlled substances</td>
<td>Of the 30 hours required every 2 years, 2 hours must be on safe and effective prescribing</td>
<td>-Of the 30 hours required every 2 years; 1 hour must be on hospice or palliative care or pain</td>
</tr>
</tbody>
</table>
of controlled substances and pain management.

Federation of State Medical Boards 2018; Davis and Carr 2016; New Hampshire Office of Professional Licensure and Certification Board of Medicine, n.d.

b. State Comparison: Regulatory and Prescribing Guidelines

**Table 6: Regulatory and Prescribing Guidelines by State**

<table>
<thead>
<tr>
<th>State</th>
<th>Regulatory Guideline?</th>
<th>Date Implemented</th>
<th>Prescribing Guidelines by State Licensing Agency/Board of Medicine?</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT</td>
<td>Yes</td>
<td>2015, 2016</td>
<td>No</td>
</tr>
<tr>
<td>ME</td>
<td>Yes</td>
<td>2012, 2016</td>
<td>No</td>
</tr>
<tr>
<td>MA</td>
<td>Yes</td>
<td>2016</td>
<td>Yes</td>
</tr>
<tr>
<td>NH</td>
<td>Yes</td>
<td>2016</td>
<td>Yes</td>
</tr>
<tr>
<td>RI</td>
<td>Yes</td>
<td>2014, 2016</td>
<td>No</td>
</tr>
<tr>
<td>VT</td>
<td>Yes</td>
<td>2014</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*Prescription Drug Monitoring Training and Technical Assistance Center 2017*

c. State Comparison: Eliminating Pill Mills

None of the six New England states have legislation prohibiting or regulating the existence of pill mills.
d. State Comparison: Prescription Drug Monitoring Programs

Table 7: PDMP Basics

<table>
<thead>
<tr>
<th>State</th>
<th>Date PDMP Legislation Passed</th>
<th>Date PDMP Became Operational</th>
<th>Mandatory Dispenser Registration</th>
<th>Mandatory Provider Registration</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT</td>
<td>2006</td>
<td>2008</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>ME</td>
<td>2003</td>
<td>2004</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>MA</td>
<td>1992</td>
<td>1994</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>NH</td>
<td>2012</td>
<td>2014</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>RI</td>
<td>1978</td>
<td>1979</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>VT</td>
<td>2006</td>
<td>2009</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Prescription Drug Monitoring Training and Technical Assistance Center 2017; Davis n.d.; Prescription Drug Monitoring Training and Assistance Center n.d.

Table 8: Prescription Drug Monitoring Program Check Requirements

<table>
<thead>
<tr>
<th>State</th>
<th>Required Check by Prescriber?</th>
<th>Required Check by Dispenser</th>
<th>Data Collection Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT</td>
<td>-Before prescribing a supply for more than 72 hours. If supply is less than 72 hours, no check required. -When prescribing opioids to patients for long term treatment, the provider must review the patient’s records in PDMP at least every 90 days.</td>
<td>No</td>
<td>Real Time/Within 24 hours</td>
</tr>
<tr>
<td>ME</td>
<td>-Before prescribing -Every 90 days for as long as that prescription is</td>
<td>Only if: -Patient or prescriber is from out of state -Patient is paying</td>
<td>Within one business day</td>
</tr>
<tr>
<td>State</td>
<td>Before prescribing</td>
<td>Renewed</td>
<td>Cash when the person has prescription insurance on file, or - Patient has not had a prescription for an opioid in the previous 12 months.</td>
</tr>
<tr>
<td>-------</td>
<td>--------------------</td>
<td>---------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>MA</td>
<td>Before prescribing</td>
<td>No</td>
<td>Within 24 hours/one business day</td>
</tr>
<tr>
<td>NH</td>
<td>Before prescribing, - At least twice per year after initial prescribing</td>
<td>No</td>
<td>Within 24 hours/one business day</td>
</tr>
<tr>
<td>RI</td>
<td>Before prescribing - Every three months for patients on continuous opioid therapy for three months or longer - Every 12 months if the patient is on the opioid for a period of six months or longer</td>
<td>No</td>
<td>Real Time</td>
</tr>
<tr>
<td>VT</td>
<td>Before prescribing, but if prescription is for ten or fewer pills, no check is required - Annually for patients who are receiving ongoing treatment with an opioid - Twice annually for buprenorphine or a drug containing buprenorphine (except prescriptions written at an OTP) - every 120 days for any patient prescribed 40 mg or greater of extended-release hydrocodone or 30</td>
<td>Only if: - A patient who is new to the pharmacy has a prescription for ten pills or the equivalent - When patient pays cash for a prescription of opioids but has prescription drug coverage on file; - When a patient requests a refill of a prescription substantially in advance of when a refill should be necessary - Dispenser is aware that the patient is</td>
<td>Within 24 hours/one business day</td>
</tr>
</tbody>
</table>
mg or greater of extended-release oxycodone per day that is not an abuse-deterrent opioid.

being prescribed opioids by more than one prescriber


Table 9: Access to Prescription Drug Monitoring Program Data by Profession and State

<table>
<thead>
<tr>
<th>Access to Prescription Drug Monitoring Program</th>
<th>CT</th>
<th>ME</th>
<th>MA</th>
<th>NH</th>
<th>RI</th>
<th>VT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescriber</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Prescriber Delegate</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Physician Assistant</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Nurse Practitioner</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Pharmacist Delegate</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Law Enforcement</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Licensing Boards</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Patient</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>State Health Agency</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Other State</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>PDMP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical Examiner</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drug Court</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prosecutor</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medicaid Fraud and Abuse Division</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drug Treatment Provider</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Healthcare Facility</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Researcher</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Prescription Drug Monitoring Training and Assistance Center n.d.*

e. State Comparison: Naloxone Access

Table 10: Who Can Access Naloxone and Where?

<table>
<thead>
<tr>
<th>Policy</th>
<th>CT</th>
<th>ME</th>
<th>MA</th>
<th>NH</th>
<th>RI</th>
<th>VT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permit prescriptions to third parties</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Permit prescription and dispensing by standing order</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Provide civil, criminal, and professional immunity to prescribers</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>(professional only)</td>
<td>(civil and criminal only)</td>
</tr>
<tr>
<td>Provide civil, criminal, and professional</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>(professional)</td>
<td>(civil and criminal)</td>
</tr>
</tbody>
</table>
immunity to dispensers

| Permit lay dispensing and administration | x | x | x | x | x |
| Provide civil and criminal immunity to lay administrators | x | x | x | x | x |
| Permit lay possession without prescription | x | x | x | x | x |
| Good Samaritan protections for people reporting overdoses | x | x | x | x | x |
| Non-paramedic First responders can administer naloxone | x | x | x | x | x |

*Davis et al 2018*

**f. State Comparison: Treatment Access**

**Table 11: Access to MAT (2017) by State**

<table>
<thead>
<tr>
<th>State</th>
<th>Number of OTP Locations</th>
<th>Number of Buprenorphine prescribers with 30 patients</th>
<th>Number of Buprenorphine prescribers with 100 patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT</td>
<td>41</td>
<td>284</td>
<td>33</td>
</tr>
<tr>
<td>ME</td>
<td>11</td>
<td>198</td>
<td>27</td>
</tr>
<tr>
<td>MA</td>
<td>76</td>
<td>575</td>
<td>81</td>
</tr>
<tr>
<td>NH</td>
<td>8</td>
<td>142</td>
<td>27</td>
</tr>
<tr>
<td>RI</td>
<td>20</td>
<td>95</td>
<td>16</td>
</tr>
<tr>
<td>VT</td>
<td>11</td>
<td>75</td>
<td>10</td>
</tr>
</tbody>
</table>

*SAMHSA, n.d.*

Connecticut, Maine, Massachusetts, and Rhode Island do not have adequate treatment capacity (National Safety Council 2016). Across the U.S., only Maine, New Mexico, and
Vermont had maximum buprenorphine treatment capacity sufficient to meet the treatment need in their state (National Safety Council 2016). Vermont has become a national leader in substance abuse treatment policy by implementing an innovative centrally managed network of OTP locations that are integrated into the state’s previously existing healthcare network. Vermont was an early adopter of office-based use of methadone and buprenorphine (Meyer and Phillips 2015) which was strengthened through the 2014 implementation of the Care Alliance for Opioid Addiction, also known as the “Hub and Spoke” model. The Hub and Spoke model was created by Vermont doctor John Brooklyn, MD and is run by the State of Vermont through the Blueprint for Health initiative, the Department of Vermont Health Access, and the Vermont Department of Health’s Division of Alcohol and Drug Abuse Programs (Vermont Agency of Human Services, n.d.). Brooklyn described the model as having “benefited from its status as a fully funded program through Medicaid expansion and political and governmental support that is also unique in the United States” (Brooklyn and Sigmon 2017).

A “Hub” is a regional opioid treatment center designed to coordinate care and support services for patients with an opiate addiction in addition to co-occurring substance abuse and/or some mental health conditions. A “Spoke” is a primary care practice or health center, which coordinates the care and support services for patients without these other health concerns. There are nine Hub locations across the state. Each serves as the site of its geographic area’s most intensive opioid use disorder treatment options. The spokes are mostly primary care or family medicine practices, and but also include obstetrics and gynecology practices, specialty outpatient addiction programs, and practices specializing in chronic pain (Vermont Agency of Human Services, n.d.). The Spokes are served by physicians, nurse practitioners, and physician assistants with waivers to prescribe buprenorphine and can provide naltrexone. Spoke care teams must also
include one nurse and one licensed mental health or addictions counselor per 100 patients. Their job is to provide specialized nursing, counseling and care management to support patients in recovery. The team element helps providers balance MAT patient care with the needs of their full patient population (Vermont Agency of Human Services, n.d.). This system “links OTPs and office-based opioid treatment programs together under one system of care and triages patients to appropriate levels of treatment based on each individual’s needs.” (Institute for Clinical and Economic Review 2014; 29). The treatment available at both Hubs and Spokes is not restricted to MAT, as patients also have access to psychosocial services from social workers, counselors, and community health teams embedded within spoke sites (Chou et al 2016). Patients can access alternative pain management methods, family support, life skills training and job trainings here(Simpatico 2015).

In 2016, roughly six thousand people were participating in the state's Hub and Spoke treatment model (Costa 2016) The strength of the Hub and Spoke model is its flexibility, as patients can shift between the two types of centers as their addiction symptoms improve or worsen and their needs change (Meyer and Phillips 2015). Patients with severe initial needs will begin treatment at a Hub, but may eventually transition a Spoke, while patients with less complex needs may begin their treatment at a Spoke (Vermont Agency of Human Services, n.d.) The system is also strengthened by its geographic range, as Hubs and Spokes combined spread treatment access out over greater distances than a clinic that combines both functions into one building, thus increasing patient access in a rural area (Mohlman et al 2016). Vermont now has the highest capacity for treating opioid addiction in the United States, with 10.56 people in treatment per 1000 people (Brooklyn and Sigmon 2017). In September of 2017, for the first time
since the opioid crisis began, there were no waiting lists for treatment in all 14 counties of Vermont (Ready-Campbell 2017).

Maine has also implemented a Hub and Spoke model that copied Vermont’s system, and was also recognized for being one of three states with adequate treatment capacity to meet demand by the NSC. However, Maine’s access to treatment comes with the caveat that use of buprenorphine requires evidence of monthly monitoring in the form of pill counts or urine tests, and is limited to a lifetime treatment limit of 24 months (Institute for Clinical and Economic Review 2014).
Chapter III: Analyzing The Relationship between Governor Prioritization of and Budget Allocation for the Opioid Crisis

i: Literature Review

I argue that governors are in the best political position to shift societal and legislative attitudes towards opioids. Governors are the most visible officeholder in state governments (Barilleaux and Berkman 2003). Not only are they the most visible, but governors have the top role in setting the statewide policy agenda. They are the officeholder best in position to provide an authoritative assessment of a state’s well-being and needs, and to propose solutions through a policy agenda (Gosling 1991). In contrast, the state legislature, with it’s “fragmentation and reliance on contained specialization” (Gosling 1991; 3) is not as well positioned to offer a clear policy vision for the state as a governor is. Governors set the policy agenda for their state (Gosling 1991). After spending a campaign offering policy goals and suggestions, governors arrive into office as the central figure for requests and demands for action or inaction (Gosling 1991).

The governor also looms largest in the public and legislative consciousness regarding the budget process. The governor plays a large formal role in the creation of and negotiations regarding the state budget. In almost every state, it is the executive branch responsible for putting together a proposed budget (Wallins 1998). A 1975 survey of state senators indicated that over fifty percent of the respondents who gave meaningful responses believed budget formation to be the most important formal gubernatorial tool (Bernick 1979). Most state fiscal years run from July 1 to June 30, and governors typically begin the process of creating a proposed budget by soliciting budget requests from state agencies in July or August, which are received and reviewed throughout the fall (Wallins 1998). The governor submits a proposed budget with
projected appropriations and revenues to the legislature typically in late January or early
February (Wallins 1998). The budget is usually referred to one appropriations committee in each
chamber, which works on the budget bill before sending it to the floor of the whole chamber to
be further amended and voted on (Wallins 1998). Most of the time, each state chamber passes a
slightly different budget, and a conference committee appointed by the leaders of the legislature
will work out a compromise budget which must be approved by both houses (Wallins 1998).
This is the final budget bill that is sent to the governor to be signed (or vetoed, which almost
never happens) (Wallins 1998). Budget bills thus follow the same legislative process that all
other types of bills must follow in order to become law. But budget bills are also unique pieces
of legislation as unlike other bills, if a budget bill does not become law, essential government
services are terminated (Crain and Miller 1990). High political, economic, and social costs are
associated with failure to enact the bill as the government will enter into a shutdown and cease
normal operations (Crain and Miller 1990). Budget bills are also unique as they happen over and
over again on a regular, predictable schedule (Crain and Miller 1990). The importance and
regularity of the budget means that a unique “budget process” has developed to move budget
bills through the legislative and executive branches, with its own specialized procedures and
institutions separate from those of the typical “legislative process” (Crain and Miller 1990;
1025).

The budget process requires the governor to act as a budget balancer (Wallin 1998) due
to public and logistical pressures. State revenue sources have become less elastic over time
(Thompson 1987). Anton (1967) argues that instead of focusing on deciding to reduce, continue,
or expand state activities, governors instead must focus on increasing revenues to keep pace with
existing programs (Anton 1967). Most of the work of state budget creation comes from analyzing
the change in inputs and expenditures from the previous year’s budget (Wallin 1998). Because of
limits on revenue increases out of fear that residents will leave the state to avoid paying higher
taxes and expenditure pressures due to inflation and increasing population size, the budget
process is highly revenue-constrained and routinized, with the appropriations decisions made by
political actors made under heavy external pressure (Wallin 1998).

One such external pressure is the need for a balanced budget. Anton (1967) also argues
that a governor must try to maintain a balanced budget even if one is not legally required,
because of public concern for "fiscal integrity." This demand for a balanced budget coupled with
the complexity of funding sources, and the pre-existing investment in state activities that must be
continued, creates an expenditure base that resists policy innovation and has built-in pressures
for increasing expenditure (Anton 1967). Governors typically will submit a balanced proposed
budget (Wallin 1998). Submitting a balanced budget to the legislature means that the governor
gains power over the legislature as to the ultimate structure of the budget (Wallin 1998). For
example, if a legislature wants tax cuts but the governor’s proposed budget is already balanced,
the onus is on the legislature to find places to reduce appropriation levels. Similarly, if the
legislature wants to increase spending in comparison to what the governor’s proposed balanced
budget does, the legislature must be willing and able to find revenues to finance it (Wallin 1998).
But just because a governor theoretically has such an advantage over the legislature does not
mean that a governor gets their proposed budget implemented.

Not all states afford the same level of formal powers to the governor, and not all
governors take advantage of their state’s full range of powers (Sigelman and Dometrius 1988).
The formal powers of a governor entrusted to the executive branch via statutory or constitutional
law represent potential powers, not guaranteed powers (Sigelman and Dometrius 1988). These
formal powers give a governor the opportunity to wield influence, but do not guarantee that the
governor will be able to achieve their desired outcome through using their formal powers.
Similarly, just because the office of the governor in a particular state has the legal authority to do
something does not mean that every individual governor to hold the office will use said power to
the fullest extent permissible (Sigelman and Dometrius 1988). Some governors are more likely to
utilize these powers than others (Sigelman and Dometrius 1988). The power a governor wields in
practice depends heavily on their personal relationships to the other branches of government and
the public. Not all governors will be influential, even if they possess great formal powers
(Sigelman and Dometrius 1988). Measuring a governor’s influence, which is to say the
governor’s actual power, is difficult, but it is through the governor’s influence that bills
successfully pass or not (Ransone 1979).

A formal power of consequence for my research question is the existence of the line-item
veto, a special form of the executive veto available to governors in forty four states. With the
line-item veto, a governor can remove certain items from the budget without having to accept
them as part of approving the entire appropriation package (Lauth 2016). The line-item veto can
be used to eliminate appropriation items (dollars), or to delete language that imposes conditions
or limitations on an appropriation item without eliminating the item itself (Lauth 2016). The line
item veto allows a governor to stave off additions or changes to the budget proposal from the
legislature that the governor rules inconsistent with their own policy priorities (Lauth 2016).

Dearden and Husted (1993) theorized that the existence of line item vetoes allows
governors to have better ability to pass budgets that they prefer. Their study found that final state
expenditure budgets is closer to the governor's proposed expenditure budgets when line-item
vetoes exist, and this impact grows with the degree of veto power. These results support the
theory line-item veto strengthens the governor's ability to obtain a more desirable budget. This study is of particular consequence for studying the New England region, as it contains three of the six state governments that do not permit the governor the power of the line-item veto: New Hampshire, Rhode Island, and Vermont (Lauth 2016).

According to Barilleaux and Berkman (2003), most research studying American state policy making focuses on the legislative branch at the expense of the executive branch. Such research is often views these offices in black and white with little room for gray, portraying governors as either highly influential or completely inconsequential (Barilleaux and Berkman 2003). There are two dominant traditions for studying influence in state budgets (Dometrius et al 2013). The first uses actual budget documents to investigate the power of the executive, an approach that began with Sharkansky (1968) (Dometrius et al 2013). The second scholarly tradition involves using survey data from observer participations of actor influence survey data (Dometrius et al 2013).

Studying the governor’s role in the budget process began in earnest in the 1960s, beginning with Sharkansky (1968). Sharkansky’s groundbreaking work explored the behaviors of state agencies, governors, and the legislature during the budget process and the environmental conditions that enhance or limit said behaviors (Thompson 1987). Sharkansky (1968) concluded that based on an examination of final budget documents from 1965-1967, legislatures typically deferred to the governor for budget matters (Abney and Lauth 1988) and that successful individual agency acquisition of appropriations is highly dependent on governor support (Thompson 1987). Sharkansky (1968) concluded that due to limitations on time, staff, and expertise, state budgeting is an incremental process in which the legislature must follow the governor’s lead (Thompson 1987). Sharkansky’s methodology provided the first empirical
framework for researching the role of the governor and legislature, coming at a key moment in which the role of the governor and the legislatures in the began to shift, changing the degree the role and powers of a governor in the budget process.

The role of the governor and the legislature experienced significant change between the mid-1960’s and mid-1980’s (Thompson 1987). Beginning with Maryland in 1916 and continuing through the 1960’s, states began implementing executive budget reform laws that gave state governors stronger control of state finances (Abney and Lauth 1998). Most states went through periods of administrative reform that streamlined the organization and introduced greater professionalization to the executive branch (Thompson 1987). Governors were granted the power to create and formally propose an executive budget, which gave governors greater access to information about state finances and the opportunity and capacity to define the legislative agenda (Abney and Lauth 1998). As such, governors gained greater enabling and institutional resources, which gave the executive branch a serious advantage over legislatures in the appropriations process, leading to executive dominance in the budget process (Abney and Lauth 1998). Governors became the dynamic factor in state political systems while legislatures were viewed as inefficient and parochial (Moe 1988). The governorship was further enhanced throughout the mid 1960s to 1980’s by increasing appointment powers, giving the governor greater power over reorganization, improving executive staffing, and centralizing management responsibilities (Thompson 1987). As a result, governors moved to positions occupying more power and more prestige in the collective consciousness of Americans (Thompson 1987).

During the 19th century, the legislature dominated the appropriations process (Abney and Lauth 1998). But after World War I, the nation’s population began to shift from rural to urban areas, legislatures lost interest in redrawing legislative and congressional districts to keep pace
with the population shift. The role of state legislatures was limited due to this malapportionment, as well as archaic legislative rules, traditions, and practices as well as constitutional limitations and low levels of appropriations for their activities (Thompson 1987). As a result, legislatures were not well organized and were poorly equipped to exert influence over budgets (Thompson 1987).

A renewed interest in the role of state legislatures arose in the 1960’s out of a series of Supreme Court decisions (Thompson 1987). In Baker v. Carr (1962), the Supreme Court ruled for the first time that federal courts had jurisdiction to hear constitutional challenges to state legislative redistricting plans (National Conference of State Legislatures 2018). In Wesberry v. Sanders (1964), the Court held that the constitutionality of congressional districts could be decided by courts (National Conference of State Legislatures 2018). In Reynolds v. Sims (1964), the Supreme Court ruled that both houses of a bicameral state legislature must be apportioned according to population, and may not reflect population equality unless doing so is necessary to give representation to political subdivisions and account for compact districts of contiguous territory (National Conference of State Legislatures 2018). The ruling in Reynolds vs. Sims (1964) also held that legislative districts should be drawn to reflect population shifts at least once every ten years (National Conference of State Legislatures 2018). These cases created a renewed awareness of the importance of state legislatures and catalyzed the creation of reforms designed to revitalize the institution (Thompson 1987).

During the 1970’s, the power of the legislatures also began improving as legislatures professionalized, as legislatures began meeting more often and paying their legislators more (Abney and Lauth 1998). Legislatures increased their staffing power especially for fiscal matters, which improved legislature’s abilities to review the governor’s policy preferences, most
importantly the budget (Ransone 1979). Thompson (1987) suggested that the enhanced role of
and increased number of legislative and administrative personnel gave rise to state-level
“subgovernments” (Thompson 1987; 765) that facilitated the development of stronger
management of relationships between between the governor and the legislators. Through changes
to both executive and legislative roles, the powers of the legislature and the governor in the
policy making process became more evenly matched (Ransone 1979).

Amidst these changes, scholars began revisiting the work of Sharkansky (1968) to
empirically evaluate the shifts in power between legislatures and legislators. A 1980 study by
Moncrief and Thompson copied Sharkansky’s methodology and found that legislatures deferred
to gubernatorial budget recommendations under unified party control of the legislature, but broke
with the governor’s recommendations when the legislature had split party control. Thompson
(1987) also used the Sharkansky methodology for data from 1978-1980 and found that governor
influence in budget affairs was declining. A caveat to these findings is that Thompson and
Moncrief (1980) used four of the same states in Sharkansky (1968) and seven new states, while
Thompson (1987) used eight of the states in Sharkansky (1968) and ten new states. Thompson
(1987) used seven of the states in Moncrief and Thompson (198) and eleven new ones. The lack
of overlap across states across all three studies means it is impossible to determine if the
differences in these results are due to actual changes across time in the influence of governors, or
due to changes in state samples (Demetrius et al 2013). Clarke (1997; 1998) also followed the
Sharkansky approach with 1985-94 data and found that governor influence in budget affairs
legislative had not declined overall, but notably was restricted when the legislature had split
party control (Demetrius et al 2013).
The roles of governors and legislatures have potentially undergone another transformation since these changes. Abney and Lauth surveyed state legislative and executive budget officials in 1982 and 1994 about their views regarding gubernatorial and legislative influence on state budget, and found that between the two time periods, the number of budget officials citing the governor as most influential dropped, concluding that gubernatorial dominance over state appropriations had ended in the late 1990’s (Abney and Lauth 1998). Thompson (1987) concluded that legislatures are less yielding to governors than they were in the mid-1960’s. While gubernatorial influence underwent a significant decline in budgetary politics since Sharkansky’s seminal 1968 study, governors still play an important role in short-term budget decisions, but legislatures were taking a more affirmative role in budget expansion (Thompson 1987).

Abney and Lauth (1998) suggest that lowered gubernatorial dominance over the budget process by the end of the twentieth century has resulted from several factors: first, legislative reforms leading to governors’ losing the ability to control the appropriations agenda. Second, the line item veto has not given governors the ability to protect their executive budget. Third, greater party division between the legislature and executive branch have increased legislative resistance to the governor’s agenda. Fourth, states have not adopted reforms guaranteeing the independence of the executive budget (Abney and Lauth 1998). But in contrast to these findings, Dometrius and Wright (2010) found no consistent decline in gubernatorial budget influence, finding instead that on average governors maintained or slightly increased budgetary influence over the legislature between the 1980’s and 1990’s (Dometrius and Wright 2010). In summary, there is no clear answer as to the power dynamic between the legislature and the governor regarding the creation of the budget in today’s day and age.
The role and behavior of a governor is often in contrast with that of the legislature. Governors have a different constituency than state legislators do, even though both governors and legislators serve the same state (Barilleaux and Berkman 2003). The governor is the only official in the process who represents the entire state (Wallin 1998). While state legislators must pay attention to the needs and wants of their “local geographic constituencies” (Crain and Miller 1990), governors instead must consider the needs and wants of a "larger and more diverse” statewide constituency (Crain and Miller 1990: 1030). This leads them to pursue different kinds of policy objectives (Crain and Miller 1990; Dometrius and Wright 2010). Legislators are incentivized by the need for reelection to pursue policies that provide targeted benefits to just their smaller, relatively more homogenous constituents. Taken as a whole, state legislatures can be expected to distribute state spending and benefits in such a way that will enhance incumbent reelection prospects (Lewis et al 2015). In contrast, the constituencies of governors are larger and relatively less homogenous, and therefore governors prioritize policies that will affect those across the state rather than just one area (Lewis et al 2015) These broader constituencies incentivize governors to pursue policies that will grant more collective benefits, such as increased spending on statewide policies designed to arrest the negative social and economic effects of the opioid abuse epidemic, whereas legislators may be more interested in such policies specifically for their district (Crain and Miller 1990). Barrilleaux and Berkman (2003) argue that governors implement higher levels of spending for redistributive programs that benefit their constituencies, based on their personal policy preferences, and therefore governors therefore do affect state policy making in systematic and theoretically predictable ways based on their personal policy preferences.

Legislators and governors may be at odds due to their different policy preferences.
stemming from different constituencies, but must cooperate heavily in order to pass a budget. The budget is one of the most significant state-level expressions of public policy (Ransone 1979). Governors will take the lion’s share of public blame or credit for the overall financial health of the state, but legislators can securely sacrifice certain individual policy preferences as long they are able to gain certain financial and service benefits for their constituencies that will help their chances for reelection (Dometrius and Wright 2010). Both suffer the political consequences when a budget is unable to be passed, in comparison to other types of legislation.

Legislators are obviously not obligated to pass a governor’s proposed policy bill. Governors are at the mercy of the “legislative monopoly” on policy passage (Kousser and Phillips 2012; 30) in every policy area other than the budget. If the legislators feel their constituencies will permit the continuation of the status quo as it stands without the governor’s proposed policy change, the status quo will persist, unless the governor is willing and able to use political maneuvering to negotiate passage of the policy (Kousser and Phillips 2012). However, in the case of the budget, if the legislature and governor cannot come to an agreement to pass the policy, “political calamity” (Kousser and Phillips 2012; 30) will strike. A late budget will typically trigger a government shutdown, and generate unfavorable public opinion and press that puts political pressure on governors and legislators to accomplish a compromise. A late budget can cause serious plummets in the approval ratings of legislators and governors (Kousser and Phillips 2012). These negative consequences are well known and therefore put pressure on both branches of government to come to negotiations before the clock runs out and a budget becomes late. In contrast to other types of proposed policies by the governor, constituencies and legislators cannot live with the status quo if no budget is passed. Therefore the advantage the legislature has over the governor disappears, and bargaining is necessary and to be expected

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(Kousser and Phillips 2012). Kousser and Phillips (2009) also suggest that the loss of a governor’s advantage and the increased bargaining power of legislatures is to be expected most when a state has a long legislative session and a professional legislature that can patiently “stand up” to the governor over a longer period of time (Kousser and Phillips 2009). The relationship between the governor and the legislature enters a special dynamic when concerning the budget.

The budget itself, and the governor’s control over it, has economic power in the sense that it determines real life financial and social consequences for recipients of a myriad of government services, taxpayers, and businesses, but it also contains symbolic power. Anton (1967) argues that the public has been taught to believe that there is someone in charge of the government and therefore there is reason for every government action. The budget document itself has symbolic value as it reassures the public that these civic beliefs are valid (Anton 1967). The budget becomes popularly and symbolically identified with the governor, who is viewed as the “someone” in charge of the state government (Anton 1967). Anton (1967) argues that the specific allocations listed in the budget and the logic behind the figures are not as important for the public perception as the fact that figures exist at all is, as their existence implies that the governor’s office has spent time and energy calculating a specific monetary figure, furthering the validity of the assumption that someone is in charge and there is a reason for every government action (Anton 1967). The budget has political power not just as a document that presents a roadmap for policy, but also for its symbolism of what the governor is paying attention to.

Previous research asserts that governors have unique and identifiable policy preferences which can be identified within their proposed budgets (Barilleaux and Berkman 2003). These preferences for the policy agenda and state budget can also be located in the governor’s state-of-the-state address and budget address (Gosling 1991). The governor’s budget message,
traditionally delivered to a joint session of the legislative chambers at the same time the governor releases their formal proposed budget, is an opportunity for the governor to communicate their policy preferences (Clarke 1998). The state-of-the-state address functions to publicize the governor’s view of the top issues facing the state and the governor’s personal policy priorities for the upcoming year. It is also one of the most publicized speeches, publicized to not just the legislature but to the public as well. Regardless of what specific policies are proposed, it sets the stage for what issues the governor plans to talk about most throughout the year, which shapes the public discourse regarding their policy proposals and governor performance. The speech primes the public to receive and discuss future specific policies to deal with the most pressing issues. The governor’s choice to place an issue in the state-of-the-state gives it weight, credence, and publicity. If an issue is not talked about in the state-of-the-state, the governor is signaling that he or she will not be giving it public prioritization in the upcoming year. The speech affords legislators a glimpse into the upcoming political battles and lets the legislature know exactly what the governor is seeking (Kousser and Phillips 2012). The state-of-the-state address focuses legislators on the governor’s agenda and can put pressure on legislators into taking action (Kousser and Phillips 2012).

There exists a long standing tradition of using of the state of the state and budget addresses in empirical analyses similar to my methods. Previous studies have used specific word appearance in the state of the state addresses, but to measure governor ideology (Coffey 2005) and governor political orientation (Weinberg 2010). Kousser and Phillips (2012) studied the rate of implementation of policies mentioned in the governor’s state of the state addresses, and found that out of the 1,088 policy proposals suggested in the studied state of the state addresses, forty one percent eventually passed, forty one percent failed, and eighteen percent were partially
enacted in some form of compromise. Combining the pass and compromise categories, governors executives successfully got at least some of what they want, as seen in these speeches, in approximately six out of every ten proposals, leading the researchers to conclude that governors are modestly more successful bargainers than legislatures (Kousser and Phillips 2012).

Gosling (1991) analyzed changes and continuity in gubernatorial policy priorities between 1970 and 1990 to determine the extent to which governors can use budgeting power to advance policy priorities across states and time. By using the state of the state address and the budget address from fourteen states from the period of 1970 to 1990 and ranking the five most important policy priorities put forth by each governor, judged by order in the speech, theme, language, length of attention, concrete policy plans, and explicit statements of importance, the study concludes that governors use their state of the state and budget speeches to set their policy agendas, and that there are measurable trends over time in popular policy topics.

ii. Methods

As I demonstrated in the previous chapter, there is variation between the six New England states across the six policies recommended by the National Safety Council to respond to the opioid epidemic. The personal policy preferences and therefore policy agendas of governors are difficult to quantitatively measure, but I contend that the issues that the governor chooses to focus on during his or her state of the state and budget addresses are those that the governor considers most pressing for the state at the time. These speeches provide the governor an opportunity to introduce his or her preferred policy agenda and proposed policy solutions. The issues that the governor prioritizes the most will be explicitly named by the governor most often. This is an objective measure, as it does not take into account the details of the policy suggested by a governor, but simply the prioritization of a singular issue within a speech amongst other
pressing problems to be addressed by their administration. The total number of times a governor uses key words related to opioids will serve as the independent variable in my regression.

I have elected to use the budget allocation for the state agency responsible for substance abuse treatment as a measure of state budget allocation towards opioids, though this should not be interpreted as the only way a state spends on the opioid crisis. The state agencies responsible for coordinating substance abuse treatment and prevention strategies are typically housed in a larger department—such as human services, public health, or mental or behavioral health. These agencies license and work with networks of local treatment providers and organizations; create, implement, and adjust prevention and treatment programs; and make sure that state residents are able to access services. Additionally, they oversee spending of state and local funds for substance abuse disorder treatment, the federal Substance Abuse Prevention and Treatment Block Grant, and Medicaid funding earmarked for substance use disorder treatment (Urahn et al 2015). The need to respond opioid epidemic has permeated so deeply across many departments, such as departments of public safety for increased police attention to drug trafficking and overdoses, departments of justice for opioid addiction treatment during incarceration and handling the influx of charges associated with drug dealing and overdoses, legislatures needing to spend time on regulatory laws, departments of health for the creation of PDMPs, and departments of children and families to handle cases where parents have lost custody due to opioid convictions or children orphaned after their parents have died of overdoses. Trying to parse out all of the different aspects of where allocations are going across multiple departments for specifically opioid-related issues was not realistic due to lack of specificity of public records on budget allocations per department and office. The percentage of the budget allocated for the agency responsible for substance abuse treatment will serve as the dependent variable in my regression.
I hypothesize that the relationship between the number of opioid-related words in a governor’s speech and percentage of the budget dedicated to the agency for substance abuse treatment is positive. The more opioid-related words that appear in a speech should indicate a higher proportion of state budget allocated to substance abuse treatment. The relationship between prioritization in the speeches and the percentage of state budget allocated to substance abuse treatment will tell us about the policy agenda setting power of governors to shape the fiscal policy response in the department responsible for substance abuse treatment to the opioid crisis and can potentially help explain why New England states, while suffering problems of the same magnitude and with similar geographic and demographic challenges, enact different policies.

To obtain data for the prioritization of the issue of opioids in state of the state and budget speeches, I used the available transcripts of every state of the state and budget address given in Connecticut, Rhode Island, Massachusetts, New Hampshire, Vermont, and Maine between 1997 and 2018. I chose to begin in 1996, the year of the introduction of OxyContin, to capture how often governors used the words in question before the reports of increased instances of opioid abuse began in the early 2000’s. In each speech I searched the transcript for the presence of seven words: “opiate,” “opioid,” “addiction,” “heroin,” “fentanyl,” “treatment,” and “overdose.” These seven terms presented a wide range of terms commonly and narrowly associated with the opioid epidemic. For each speech used, I aggregated the number of instances of each word’s usage to get a total number of words per speech variable, which served as the independent variable for my model.
Figure 9: Use of Opioid-Related Words in Budget Speeches

Figure 10: Use of Opioid-Related Words in State of the State Speeches
The number of opioid-related words present in a speech does not account for the total prioritization of the issue within the speech, so I used two speech related control variables to account for a more nuanced measure of prioritization in a speech within my regression model. The number of times a particular word related to an issue is stated, how early on in a speech it is mentioned, and how long the governor speaks about the issue is a more holistic approximation for the governor’s prioritization of an issue. Previous scholars assert that governors place the issues they deem most important earlier in the speech (Gosling 1991). So I also looked to see how far into the speech these opioid-related words first appeared to create a rank variable, indicating how many topics the governor introduced before speaking about opioids. If the speech transcript included a formal organization of issues, I counted each heading as one issue and counted to how much headings it took for the governor to bring up opioids. If the transcript did not include an official organizational structure of headings, I read through the speech speech and counted the specific topics and thematic sections to create a ranking of issues within the speech. In doing this ranking, I did not include the governor’s rhetorical introduction or explanation of the budget structure as the first topic, instead beginning the rankings with the first individual policy or issue mentioned.

I also accounted for the length of the governor’s opioid discussion within the speech, counting how many words appeared surrounding each instance of the key seven words regarding the issue of opioids. This measure of length should provide clarity as to if the governor is simply mentioning the opioid epidemic briefly in passing, or if he or she is proposing a detailed policy regarding some facet of the crisis that takes a longer time to explain. If mentions of opioids appeared multiple times in a speech, the measure of length is an aggregate marker of total words dedicated to opioids. There were instances in which one of the seven key opioid-related words
appeared, but not in the context of opioids. In these cases, I reported the ranking measure and length measure as both zero.

To obtain budget allocation data for substance abuse agencies in each state for each year, I used the general appropriations act as passed for each fiscal year from 1997 to 2018. I used the appropriations figure originally passed for that fiscal year without adjustments, as I was interested in capturing prioritization in the moment in what appropriations were passed and signed closest to the governor’s speech, rather than the adjustments made in the second half of the fiscal year after more time had elapsed.

Figure 11: Percentage of State Budget Allocated for the Agency of Substance Abuse Treatment
Table 12: Average Budget Allocation for Agency Responsible for Substance Abuse Treatment By State

<table>
<thead>
<tr>
<th>State</th>
<th>Average Budget Allocation for Agency Responsible for Substance Abuse Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT</td>
<td>2.68</td>
</tr>
<tr>
<td>ME</td>
<td>0.36</td>
</tr>
<tr>
<td>MA</td>
<td>0.25</td>
</tr>
<tr>
<td>NH</td>
<td>0.41</td>
</tr>
<tr>
<td>RI</td>
<td>0.36</td>
</tr>
<tr>
<td>VT</td>
<td>0.62</td>
</tr>
</tbody>
</table>

In addition to controlling for the length of the governor’s discussion of the opioid addiction epidemic, and for where the opioid addiction epidemic appeared in the ranking of the issues present in the speech, I also controlled for year, state, the party of the governor, whether the governor’s party also controls the legislature, and the presence of the line item veto in the governor’s formal powers. I used an OLS regression model of:

\[
\text{Percentage of Budget} = \text{Words} + \text{Rank} + \text{Length} + \text{State} + \text{Year} + \text{Governor Party} + \text{Party Control} + \text{Line Item Veto}
\]

Using this model, I performed two separate regressions, one using data on word usage, issue rank, and issue length from the state of the state addresses and the other using data on word usage, issue rank, and issue length from budget addresses. I did so in order to avoid double counting the percentage of budget allocated for the office of substance abuse in the same regression, as the two sets of data for state of the state addresses and budget addresses included many of the same years.

iii. Results
Table 13: Relationship Between Opioid Addiction Epidemic Prioritization within Governor’s State of the State Addresses and Percentage of State Budget Allocated to Agency of Substance Abuse Treatment

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>30.59</td>
<td>(18.80)</td>
</tr>
<tr>
<td>Words</td>
<td>0.00</td>
<td>(.01)</td>
</tr>
<tr>
<td>Rank</td>
<td>-.01</td>
<td>(.01)</td>
</tr>
<tr>
<td>Length</td>
<td>0.00</td>
<td>(.00)</td>
</tr>
<tr>
<td>CT</td>
<td>1.98</td>
<td>(.15)</td>
</tr>
<tr>
<td>ME</td>
<td>-.24</td>
<td>(.17)</td>
</tr>
<tr>
<td>MA</td>
<td>-.34**</td>
<td>(.14)</td>
</tr>
<tr>
<td>NH</td>
<td>-.10</td>
<td>(.16)</td>
</tr>
<tr>
<td>RI</td>
<td>-.26*</td>
<td>(.14)</td>
</tr>
<tr>
<td>Year</td>
<td>-.01</td>
<td>(.01)</td>
</tr>
<tr>
<td>Democrat Governor</td>
<td>-.23**</td>
<td>(.11)</td>
</tr>
<tr>
<td>Governor Party in Control</td>
<td>0.03</td>
<td>(.12)</td>
</tr>
<tr>
<td>Line Item Veto</td>
<td>NA</td>
<td>(NA)</td>
</tr>
</tbody>
</table>

N=62
R-squared=.89

* p < 0.10, ** p < 0.05, and *** p < 0.01
### Table 13: Relationship Between Opioid Issue Prioritization Within Governor’s Budget

Addresses and Percentage of State Budget Allocated to Agency of Substance Abuse Treatment

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>30.91</td>
<td>(27.23)</td>
</tr>
<tr>
<td>Words</td>
<td>.053</td>
<td>(.03)</td>
</tr>
<tr>
<td>Rank</td>
<td>-.03</td>
<td>(.02)</td>
</tr>
<tr>
<td>Length</td>
<td>-.001*</td>
<td>(.00)</td>
</tr>
<tr>
<td>CT</td>
<td>2.1</td>
<td>(.14)</td>
</tr>
<tr>
<td>ME</td>
<td>-.23</td>
<td>(.27)</td>
</tr>
<tr>
<td>MA</td>
<td>.14</td>
<td>(.20)</td>
</tr>
<tr>
<td>NH</td>
<td>-.06</td>
<td>(.17)</td>
</tr>
<tr>
<td>RI</td>
<td>-.27</td>
<td>(.25)</td>
</tr>
<tr>
<td>Year</td>
<td>-.01</td>
<td>(.01)</td>
</tr>
<tr>
<td>Democrat Governor</td>
<td>-.25</td>
<td>(.20)</td>
</tr>
<tr>
<td>Governor Party in Control of State Gov’t</td>
<td>-.19</td>
<td>(.22)</td>
</tr>
<tr>
<td>Governor Has Line Item Veto Power</td>
<td>NA</td>
<td>(NA)</td>
</tr>
</tbody>
</table>

N=49  
R-squared=.91

* p < 0.10, ** p < 0.05, and *** p < 0.01
iv. Discussion

In this thesis I have discussed the variation in state policy responses to the opioid crisis in New England states. I contended that the variation of New England state policy responses to the opioid epidemic can be partially explained by the prioritization of the issue by state governors, theorizing that there is a positive relationship between a governor’s prioritization of the opioid crisis within his or her policy agenda, and the percentage of the state budget allocated for opioid crisis response programs and policy initiatives. In order to analyze this, I used the number of times a governor used seven key opioid-related words in state of the state and budget speeches as a proxy for the prioritization of the issue by the governor, and the percentage of the budget allocation to the state agency responsible for substance abuse treatment as a proxy for the percentage of the state’s budget dedicated to responding to the opioid crisis.

With words per speech as the independent variable and percentage of the budget as the dependent variable, I hypothesized that the relationship between the prioritization of the opioid epidemic in a governor’s speech and percentage of the budget dedicated to the agency for substance abuse treatment should be positive. The more opioid-related words that appear in a speech, spoken earlier and in more detail, should correspond to a higher percentage of the state budget being allocated to the agency for substance abuse treatment.

For both of my regressions, I used a .10 two tail test due to the small n and large standard errors present. For the regression using data from the state of the state addresses, I failed to reject the null hypothesis that there is no relationship between the number of words related to the opioid addiction in the speech and the percentage of the state's budget allocated to the agency for substance abuse treatment. The regression using data from state of the state addresses did not produce any statistically significant results for any of the three variables relating to prioritization
of the opioid crisis in the governor’s speech (words, rank, and length), indicating that in state of
the state addresses there is not a detectable relationship between prioritization of the opioid crisis
by the governor within a state of the state address and the percentage of the state's budget
allocated to the agency for substance abuse treatment.

For the regression using data from the budget addresses, I rejected the null hypothesis
that there is no relationship between the the number of words related to the opioid addiction in
the speech and the percentage of the state's budget allocated to the agency for substance abuse
treatment. Of the three variables relating to prioritization of the opioid crisis in the governor’s
speech (words, rank, and length), rank was not statistically significant, indicating that the ranking
of discussing opioids amongst other issues within the governor’s budget address has no or an
undetectable effect on the percentage of the state budget allocated for the agency of substance
abuse treatment. For the regression of the budget address data, the length of the governor’s
discussion of the opioid epidemic is statistically significant at the .10 level with a p value of .090,
and has a negative impact on the percentage of the budget allocated towards the agency
responsible for substance abuse treatment. For a one word increase in the length of the
governor’s discussion of the opioid addiction epidemic, there would be a -.001 decrease in the
percentage of the state's budget allocated to the agency for substance abuse treatment, a low low
magnitude of impact. While the aggregate presence of the seven key opioid-related words is does
not officially meet the standard for statistical significance at the .10 level, the p value for this
variable is .107, which is close to being statistically significant at this level and is sufficient
enough to warrant discussion especially given the low n of this study. The number of key opioid-
related words in the budget address has a positive impact on the percentage of the budget
allocated towards the agency responsible for substance abuse treatment. For a one word increase

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in the number of key opioid-related words present in the budget speech, there would be a would be a .053 increase in the percentage of the state's budget allocated to the agency for substance abuse treatment. The magnitude of the positive impact of the number of words related to the opioid addiction in the speech on the percentage of the state's budget allocated to the agency for substance abuse treatment is higher than the magnitude of the negative impact of the length of the governor’s discussion of the opioid addiction epidemic, indicating that just using the key opioid-related words in the speech has a stronger positive impact on the budget allocation than the length of the governor’s discussion of the opioid crisis does.

In conclusion, the prioritization of the issue of opioid addiction in the governor’s speeches does have a statistically significant impact on the percentage of the budget allocated to the agency responsible for substance abuse treatment, but only when looking at budget addresses. I suggest that an explanation for the lack of statistically significant results in the state of state addresses regression is due to the fact that these speeches are one of the first steps in working towards budget allocation, and the major impact of the governor’s prioritization of the opioid addiction epidemic instead happens in budget address, when legislators will more seriously consider a governor’s policy preferences as they get down to the brass tacks of the budget negotiations. I argue that the mechanism at work here is not that the legislators care about the exact number of specific words spoken by the governor opioid crisis, but rather it is the prioritization of the opioid epidemic by the governor, as measured by the number of times he or she says these words and for how long he or she discusses it, that influences the legislators on the budget, who are more likely to be receptive to this during the budget address.

My results support my contention that governors are in a good political position to shift societal and legislative attitudes towards opioids. These findings indicate that the prioritization of
the opioid addiction epidemic in the governor’s budget address has a positive overall relationship with the percentage of the state budget allocated to the agency for substance abuse treatment. These results provide one explanation for why New England states, while suffering problems of the same magnitude and with similar geographic and demographic challenges, have enacted different policies in response to the opioid addiction epidemic (specifically in the case of substance abuse treatment) due to different levels of prioritization of the opioid addiction epidemic by governors in their budget addresses.

This thesis adds to an extensive body of literature examining the role of governors in the budget process, and to my knowledge is unique in its use of words in the state of the state and budget addresses to examine the prioritization of a single issue by a governor within these speeches and the effect that prioritization has on budget allocation. This thesis adds to the body of literature dedicating to understanding how the opioid epidemic occurred and how it may be battled. The problem of opioid abuse affects far more than those people directly affected by opioid abuse, it negatively impacts a variety of social and economic factors. It is impossible to adequately capture in words the sadness of so many overdose deaths that creating dramatic gaps in the social and economic fabric of communities across New England, big and small alike. But the more that New England governors put this tragedy into words in budget addresses, we will hopefully see more funding dedicated to addressing this crisis through the state agencies responsible for substance abuse treatment.

v. Limitations

Not every state had the general appropriations act available for all years from 1996 to 2018, and not every state had transcripts for the state of the state and budget addresses available from those years on file. Within budget allocations for the agency responsible for substance
abuse treatment, allocations are not further broken down into funding for opioid substance abuse treatment versus substance abuse treatment for alcohol and other drugs. Not all of the funding appropriated to the substance abuse treatment department will go directly to just opioid addiction treatment. Future studies should consider using more finely targeted data if possible, and should examine other types of spending related to the opioid epidemic, such as the criminal justice system or the department of children and families.
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