The Historical and Social Context of the Opioid Epidemic's Implication of Narcan as a Public Health Intervention

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The longest war ever fought by the United States (U.S.) is one that is domestic and is still ongoing; the Drug War. The United States government has been fighting this war for over 70 years, and there is still no end in sight. This is a gradual war that has evolved over time, but has not produced many positive results. While the Drug War continues, there is an effective weapon at the disposal of public health: naloxone. My goal is to look at the social and historical implications of the Drug War, and how those have impacted the use of naloxone as a public health tool. I accomplish this goal by conducting a case study on Berks County, since there has been an increase in overdose deaths, through the use of interviewing different individuals involved in treatment and in the politics of addiction within the county.

There are two major problems with the use of drugs in the U.S.: the creation of a drug culture and the policies that regulate the use of drugs. The U.S. has created an extensive drug culture over the past century. We have medicalized several aspects of our everyday lives. For example, when sick, a person's immediate thought is to go take a medication to help cure the illness or relieve symptoms. The same thing occurs when one is in pain, and is looking for relief. Americans take vitamins to help meet dietary needs. If one is unable to sleep, then take a sleep aid. Before exercising, many people drink pre-workout concoctions. This medicalization of everyday life has created a culture in which people are dependent on taking something to achieve a desired effect. The same concept applies when taking an illicit drug. The person wants to feel the effects of the drug for pain relief, or for energy, or to relax. However, the War on Drugs has only further amplified the stigma associated with illicit drug use and addiction, and in the process has impacted different populations in the U.S.

The other problem involves the way drugs are regulated in the U.S. Historically, the U.S. has imposed federal regulations against drugs, with laws being passed starting in the early 1900s.

This has led to various historical and legal implications in the Drug War. There are various laws that impose stricter controls on some classes of drugs more than on others. Then there are items, such as alcohol and tobacco, which are very detrimental to society but legal for adult consumption. This creates a duality to the drug problem. Therefore, is it possible to apply policies used to regulate tobacco on the currently set illicit drugs (Jonas, 2016)?

Specifically, one type of drug class that has been gaining attention in the media is opiates and heroin. It is not uncommon to see a news article about a growing heroin epidemic, or an increase in overdose rates. In fact, the opioid epidemic has been an increasing problem in the United States and in Berks County, PA. The number of overdoses in the U.S. quadrupled between 2000 and 2013. In 2013, there were over 8,000 overdose deaths from heroin alone. Furthermore, research has shown that heroin is being used by people of all ages, races, and socioeconomic status, indicating that this problem is not isolated to a selected group or population (Jonas, 2016). The state of Pennsylvania in 2015 reported a 23.4% increase in drug-related overdose deaths. The report also had some interesting trends: the common age of those who died was 40, 67% were men, and 74% were white. Meanwhile, in Berks County, the *Reading Eagle* reported an increase in heroin related deaths (Turner, 2016). In 2007, only 6 reported deaths were related to heroin, while in 2015 there were 27 deaths. In the first half of 2016 alone there were 22 deaths (Turner, 2016). This is an increasing problem not only in the country, but also in the region.

In recent years there has been an increase in the demand for naloxone. Naloxone is a drug that reverses an overdose, potentially saving one's life. As naloxone has become commonplace in the U.S., controversy has arisen around its use. In my personal experience, I first learned about naloxone about four years ago. I am an Emergency Medical Technician

(EMT) in the state of New Jersey, and the ambulance company I volunteered with had recently acquired Narcan, the intranasal brand name for naloxone. As a squad, we all underwent training on how to use naloxone, so that we could use it if necessary while on calls. The police department that works with my ambulance company also has naloxone kits in the event of an overdose. This indicates the growing popularity of the drug among first responders.

While naloxone is effective at reversing an overdose, it does not treat addiction. Naloxone is an effective tool to prevent death by overdose, which is necessary in an emergency situation. However, it is not a treatment for addiction, which is important to understand. Naloxone's roles in medicine serves as a public health tool that focuses on intervention. Public Health is focused on planning, implementing, monitoring, and assessing interventions that are made to prevent the population from obtaining disease. There are three levels of intervention: primary, secondary and tertiary. Primary intervention focuses on interventions that reduce risk factors for disease, and may focus on educating people about the disease. Immunizations would be an effective primary prevention. Secondary intervention involves screening measures to detect any problems in health, such checking one's blood pressure. Tertiary intervention interventions focus on treatment and rehabilitation. The disease has already taken effect on the person. The next step is to treat the disease, and then focus on recovery from the disease (Virtual Campus for Public Health, 2015). Naloxone is a tertiary intervention, as it reverses the immediate symptoms of an overdose but does not treat or prevent the disease of addiction. Therefore, naloxone cannot be used as a standalone intervention, and must be paired with primary and secondary interventions.

There are several social, historical, political, and legal events that have impacted the Drug War in the U.S. There is a belief of enforcement of laws and punishment for drug offenses on

one side, and there are people who suffer from a medical condition, addiction, on the other. Historically, the United States has focused on the legal rather than the medical aspects of addiction. The current fad to prevent drug addiction is focused on the increased use of naloxone, because it saves lives. Naloxone, however, does not prevent addiction; only primary and secondary interventions can prevent such a disease. Fortunately, research is being conducted (psychologically and biologically) on addiction and treatment possibilities in the U.S., as public health trends become more prominent in medicine. Unfortunately, there is heavy political pressure in the public health realm to pass policies and provide funding for the various interventions that could improve the health of a population. However, the field of public health is not just restricted to politics, as it is present in various fields of study. The case study of Berks County demonstrates this point. There are two different views in the case study: people involved in direct treatment of addiction, and people involved in politics and law enforcement. These interviews and the associated background research will help identify public health problems within the county, as they relate to naloxone and the opioid epidemic.

History of Opiates and the Drug War

Looking at the origins of opiate use

Opiates have been used medicinally and recreationally for thousands of years. Opiates come from the opium poppy, *Papaver somniferum* (Gruber et al., 2007). The earliest recorded use of opiates is seen with the Sumerians around 3000 BC. The Sumerians lived in present day Iraq, and cultivated the poppy seeds to isolate opium from the seed capsules. The ancient Greeks also used opiates to dull pain and create a feeling of euphoria, as is evident in Homer's *The Odyssey* around 900 BC. Opium was believed to be used in religious rituals, to heal those who

were sick, and to help those who were dying experience a painless death. By the eighth century, Arab traders introduced opium to China and India. From there, the opium trade continued and had reached Europe between the tenth and thirteenth centuries. Manuscripts dating back to the sixteenth century started detailing drug abuse and addiction occurring in various European countries. Meanwhile, the addiction was worse in China, as people began smoking the drug. China, as a major supplier in the opium trade, was unable to ban opium due to the demands of the European nations (Brownstein, 1993).

It was not until the 1800s that opium was extracted in a pure form. In 1806, German scientist Friedrich Serturner was able to extract the active ingredient in opium and named it morphine after the god of dreams. This drug could be made in copious amounts. With the invention of the hypodermic needle in the 1850s, morphine was used more readily in minor surgeries (Brownstein, 1993). The first synthesized medical opiate was codeine. Codeine was synthesized in the 1830s by French scientist Pierre Robiquet as a replacement for raw opium in medical use (Drug-Free World.org, 2017). Both drugs were still very similar to opium, and thus had a high safety risk for addiction. Chemists then tried to make a synthetic non-addictive painkiller following the American Civil War, during which injuries caused thousands of soldiers to be exposed to these drugs. Their exposure led to addiction. The result was the creation of heroin in 1898 by the German pharmaceutical company Bayer. While heroin was less addictive than morphine, it was a stronger painkiller (Brownstein, 1993). Since then, several synthetic painkillers have been made by the pharmaceutical industry, such as Vicodin (acetaminophen and hydrocodone), OxyContin (oxycodone), Percocet (acetaminophen and oxycodone), and fentanyl (Substance Abuse and Mental Health Services Administration.gov, 2017).

US Drug Policy and the framework of the Drug War

There are several historical and social implications that set the stage for the growing drug abuse epidemic. The Drug War has been ongoing for over 70 years. The Food and Drug Administration (FDA) was formed in the early 1900s, prompted by Upton Sinclair's *The Jungle,* which chronicled the horrible safety regulations of the meat industry in the U.S. In 1909, opium by smoking was outlawed through the Opium Exclusion Act by the FDA (Gieringer, 2009). This was due to an increase in opiate addiction in the United States. Further regulation came about in 1914 under the Harrison Act. Manufacturers, importers, and distributors of opium had to register with the U.S. Department of Treasury. Physicians were able to prescribe opium under the Harrison Act, however, after several arrests, most stopped this practice. In 1937 the Marihuana [sic] Tax Act was passed. This act created the Federal Bureau of Narcotics (FBN), which was established within the Treasury Department (Sacco, 2014). Furthermore, the FBN was headed by Henry Anslinger, who was a prominent prohibitionist in the 1920's (Jonas, 2016). These laws created a social perception of intolerance towards using drugs, and most likely caused a decline in usage. During World War II, narcotic use was brought to low point. This was most likely due to the war disrupting trade routes. However, following the end of World War II there was fear of drug use increasing, as was claimed to have happened following World War I (Lowinson et al., 2005). This led to the passage of the Narcotics Control Act in 1956 during the Eisenhower administration. This act called for raising the minimum sentencing years for drug-related crimes and even established the death penalty for some narcotic offences (Sacco, 2014).

The 1960s witnessed a cultural shift in the United States. A drug subculture developed throughout the decade. The American Bar Association began to speak out against the high minimal sentences for drug offenses. Interestingly, Congress began looking into alternative methods to handle drugs and addiction (funding for research, less strict sentencing, and

dismantling the FBN). The Presidential Commission in 1963 formed the Bureau of Drug Abuse Control within the Department of Health, Education, and Welfare. This led to the implementation of the Narcotic Addict Rehabilitation Act. This was a step forward from the previous laws passed in the first half of the 20th century. It focused on the idea of mandating treatment for someone who was found to be addicted to illegal drugs and convicted, instead of sentencing them to prison. Congress believed that treating those convicted of drug use would lead offenders to "return to society as useful members." While there was a shift in attitude about sentencing drug offenders, there was still a focus on enforcement. In 1968, the FBN merged with the Bureau of Drug Abuse Control, and its regulating powers became housed under the Department of Justice (DOJ). However, this period of shifting attitude on drug use would not last for long, as Richard Nixon's presidency, beginning in 1969, would bring back the war on drugs (Sacco, 2014).

In 1970, Congress passed the Controlled Substance Act (CSA), which was part of the Comprehensive Drug Abuse Prevention and Control Act of 1970. The CSA served as the framework for the government to regulate the lawful production, possession, and distribution of controlled substances. Furthermore, it classified drugs into different categories based on how dangerous they were, potential for abuse and addiction, and if they had any significant medical use. The same year that the FDA approved naloxone (marketed as a prescription only medication), Nixon declared "The War on Drugs." At this point the Drug Enforcement Agency (DEA) was established in 1973. It would serve as the main regulatory agency under the DOJ for the CSA. Nixon's focus on increased regulation was due to the rise in drug abuse that occurred during the 1970s. Nixon also used the War on Drugs as a political platform. His increased regulations would be continued even after he left office (Sacco, 2014).

The next major episode in the Drug War happened when Ronald Reagan took office in 1980. Reagan's administration focused on increased regulation efforts. In 1981, Congress passed the Military Cooperation with Law Enforcement Act (MCLEA). This act served as an exception to the Posse Comitatus Act. The Posse Comitatus Act was created in the late 1800s as a way to constrain military policing in the domestic affairs of the U.S. The MCLEA allowed the military to provide advice, military equipment, and facilities to domestic law enforcement. This exception created a militarized attitude of drug law enforcement (Hall and Coyne, 2013). There was over a 50% increase in the number of federal drug convictions through the DOJ policies and agencies in the 1980s. The Comprehensive Crime Control Act of 1984 and the Anti-Drug Abuse Acts of 1986 and 1988 increased federal regulation and penalties in regard to drug use. More importantly was the formation of the Office of National Drug Control Policy (ONDCP). This federal office was tasked with coordinating other federal agencies to reduce the drug supply and demand. This office was to create policies, priorities, and objectives for the federal Drug Control Program. Meanwhile, on the social front was Nancy Reagan's "Say No Campaign," which served as a primary intervention to drug use (Sacco, 2014).

In the 1990s and early 2000s, the federal government continued further focus on enforcement. The DEA has increased the number of Tactical Diversion Squads, which combine federal, state, and local resources to prevent the distribution of narcotics. However, all of these policies have come at a great cost (Sacco, 2014). Over the past 70 years, the Drug War has cost over $1.5 trillion (Jonas, 2016). The DEA budget was $74.9 million in 1970, when it first formed, and in 2013, its budget was about $2 billion. Similar monetary increases occurred in the Federal Drug Control Budget, from $19.88 billion in 2005 compared to the $25.21 billion in 2014. While the budget has started to focus on other areas, such as drug abuse treatment ($8.83

billion in 2014), it still spends the most on domestic law enforcement ($9.27 billion in 2014). It has also affected the lives of hundreds of thousands if not millions of people through poverty, targeting, healthcare, arrest, and many other ways (Sacco, 2014). In 1990, the United States became the world's number one jailer. Over half of the offenders sentenced to the Federal Bureau of Prisons in 2012 were due to drug related crimes. It was also found that in 2012, the average federal jail sentencing for offenders was 11.3 years, which can be costly over time (Taxy et al., 2015). However, with all this money and long sentences, there are still people using illegal drugs. Heroin overdoses are still increasing. Therefore, it brings into question the efficacy of the Drug War, however, it continues to be fought with little change.

Stakeholders in the Drug War

A major reason the Drug War continues is due to the various stakeholders that benefit from it. In particular, the prison industry, certain politicians, pharmaceutical companies, and the drug cartels all have interests in the Drug War. The U.S. has one of the highest incarceration rates in the world, which creates a need for prisons to hold these offenders. More prison complexes also mean more staff is hired, thus adding to the industry. The private prison industry has been growing in the U.S., and benefits directly from the Drug War (Jonas, 2016). Over half of the incarcerations to the federal bureau system were drug related and their average sentence was 11.3 years in 2012. This costs a lot of time and money to keep prisons operating (Taxy et al., 2015). A lot of these arrests come from the various drug laws that have been passed over the years, which set high minimum sentencing times. U.S. policy focuses on enforcement and incarceration as deterrents to drug use, however, the incarceration rate is still extremely high. Therefore, the prison system continues to benefit from incarcerating drug offenders. A change in drug policy would adversely affect this industry and its workers. Another problem in the prison

system is racial bias sentencing. About 14 million White Americans reported using drugs compared to 2.6 million Black Americans, but Black Americans are 10 times more likely to be arrested, convicted, and sent to prison for a drug offense. This type of bias targets a population to fuel the prison industry. The prison industry has also increased its presence into the political realm by donating money towards political campaigns, which can later benefit those prisons (Jonas, 2016).

Politicians have used the Drug War for years as a platform, whether they are for or against it. Both Nixon and Reagan passed various drug laws in a 20 year period. President Clinton had a role in strengthening the Drug War through mass incarceration. A specific example with politics and the Drug War was under the leadership of Nelson Rockefeller. He was the governor of New York at the start of the Drug War in the late 1960s. Rockefeller would become known for his infamous drug laws: possessing four ounces of heroin would lead to fifteen years minimum for a jail sentence. Rockefeller made such harsh drugs law to show that he was tough on crime in an attempt to become the Republican Presidential nominee. This occurred after he was booed off the stage at the 1964 Republican National Convention. Another example comes from Nixon's domestic policy advisor, John Haldeman. Haldeman said that the Nixon campaign had two major enemies: antiwar activists and Black Americans. He further claimed that public opinion was made to "associate the hippies with marijuana and blacks with heroin, and then criminalizing both heavily, we could disrupt those communities" (Jonas, 2016). These are a few examples of politicians using this controversial topic for their own purposes.

The pharmaceutical companies and drug cartels play a role in the drug war, especially with heroin. The Drug War allows pharmaceutical companies to keep producing drugs that are just as dangerous, if not worse, than current illegal drugs (mainly due to the various side effects

that can be experienced), from which they can then profit. It also allows them to keep producing current legal drugs that have caused great harm, such as Vicodin and OxyContin. For example, opioid prescriptions in the U.S. have increased from 76 million in 1991 to 207 million in 2013 (Hawk et al., 2015). The increased prescriptions can lead to drug diversion: prescription medications that are obtained or used illegally (Centers for Disease Control and Prevention.gov, 2016). These drugs are synthetic compounds of opium, like heroin. Therefore, their initial intent to help patients cope with pain can become addictive, and lead to further illegal use, or the use of heroin as an alternative. The drug cartels also greatly contribute to the problem. Laws and enforcement focused on illicit drug use creates a black market for people to obtain these drugs. This black market, in the form of drug cartels, can then profit from this illegal trade. Once the drug cartels begin profiting, they will fight to keep their enterprise going. The violence that has occurred from the drug cartels creates a whole other level to the Drug War (Jonas, 2016).

Opioid Addiction and Overdose

How opiates work

Opioids are chemical compounds that travel through the body when injected, sniffed, inhaled, or swallowed. These chemical compounds travel to the brain where they bind to specific opioid receptors. There are three identified receptors: mu, kappa, and delta. The receptors are proteins that are found on the outer membrane of cells in neural tissue. The opioid chemical acts as an agonist, which is a chemical that binds to a receptor to produce a biological response. The opioid mimics other types of proteins (i.e. endorphins, enkephalins, and dynorphins) that are naturally produced in the body. This mimicry allows the opioid to bind to these specific receptors (Gruber et al., 2007). Upon binding to the receptor, a complex signaling

cascade occurs inside the cell. This causes the cell to turn on genes to then produce a specific protein. This protein can then exit the cell and travel through the body to illicit its biological function. The protein induces its function as a neurotransmitter, which is a chemical messenger in neural tissue. The chemical messenger can instruct the brain to produce abnormal amounts of neurotransmitter (Reece et al., 2011). In the case of opioids, the chemical binds to the receptor and induce the cells to create large amounts of dopamine (involved in blood flow) and endorphins. The result is a feeling of euphoria, as pain is blocked by the neurotransmitters being produced, and slowed breathing, which causes relaxation (Gruber et al., 2007).

The receptors are located primarily in the central nervous system including the brain and spinal cord. The highest concentration of opioid receptors is located within the limbic system, including the thalamus, amygdala, and hypothalamus. This is important as these structures in the brain are responsible for emotion, sensory input, and the hormone regulator for pain relief. Therefore, when opiates target the specific receptors, they are located primarily in the limbic system, which creates the impaired sensory conditions and feeling of euphoria (Gruber et al., 2007).

Defining Addiction

The problem with opiates is that they are highly addictive substances. Opiates are commonly used as painkillers. However, these painkillers can induce feelings of euphoria, which becomes problematic when people want to always maintain and continue that euphoria feeling. This result leads to more use of opiates, and the creating of an addiction and abuse. Addiction is when there is a dysfunction in the brain's reward, motivation, memory, and other related circuitry. This dysfunction causes the person to have biological, psychological, and

social symptoms, which may lead to the person persistently pursuing the substance for relief of these symptoms (American Society of Addiction Medicine.org, 2011).

There are various negative symptoms when addicted to opiates. The person is unable to consistently abstain from drug use, there may be behavioral impairments, increased craving for the drug and its reward, inability to recognize problems with one's behaviors and interpersonal relationships, and dysfunctional emotional responses. Over time, tolerance to the opiate begins to occur, and it then takes more opium to achieve the desired effect. There are also withdrawal symptoms, spending money to get the opiates, and even doing whatever it takes to get more opiates (Substance Abuse and Mental Health Services Administration.gov, 2017). The addiction creates an entire network of hardships. The person may lose his/her job, friends and family, his/her house, become unable to take care of his/herself (which all lead to medical issues developing later), or become involved with criminal activities. These are all secondary effects from the addiction. There is a direct way that the addiction can harm the person: when the user overdoses on the opiates (Addictions & Recovery.org, 2017).

Opiates target the brain to produce the feeling of euphoria, but can also target other systems in the brain. The addiction causes the user to take more and more opiates to reach that euphoria feeling. It is believed that the reward system is activated in the brain, thus the person continually seeks the reward of more opioid use. This then aids in the person's addiction. Unfortunately, the increase in the amount of opiates can affect ones breathing. The mu receptor is the most targeted receptor during opioid use, and therefore, has a high abuse liability. The mu receptor is able to affect the hypothalamus, which is involved in homeostasis functions, such as regulation of breathing (Gruber et al., 2007). The result is a reduced breathing rate, which can

lead to respiratory distress. If respiratory distress is prolonged without any intervention then the person will experience brain damage and ultimately die (World Health Organization.int, 2014).

A "New" Public Health Tool: Narcan

As the Drug War continues, new tools have become available to aid people in fighting drug use. Among them is the drug naloxone (Narcan). This drug has the capability of reversing an opioid induced overdose. During research with opioids, naloxone was discovered to be a powerful antagonist to opioids and opioid receptors (Brownstein, 1993). It was first approved by the FDA in 1973 and made for prescription and physician use only (Sacco, 2014). Naloxone works by binding to the same receptors that heroin binds to in the brain. By naloxone binding to these receptors instead of heroin, it prevents the effects of opioid overdose from continuing. In fact, it causes a relatively quick reversal from an opioid overdose. Naloxone is available through intravenous injection, intramuscular injection, and intranasal administration. The main side effect of administering naloxone is withdraw. Since the person's opioid-induced state is being reversed, the person will experience headaches and nausea (NaloxoneInfo.org, 2015).

In 1996, the first naloxone distribution center opened in Chicago, and was called the Chicago Recovery Alliance (Hawk et al., 2015). In 2003, the first naloxone distribution program sanctioned by a health department was formed in San Francisco. Since then, naloxone distribution programs have greatly increased. As of 2010, there were over 180 naloxone distribution programs in the US (Rowe et al., 2015). At the same time, the number of emergencies related to overdoses have also increased. This has led to emergency service organizations to begin carrying naloxone. Realizing that law enforcement often arrives at an emergency first, several police departments have begun giving officers naloxone kits. The police

officer could administer the naloxone before the ambulance arrives, thus beginning a potential lifesaving treatment (Summer et al., 2016). One of the leading police departments to test the use of naloxone, was the Quincy, MA Police Department (Beletsky, 2014). Today most police departments and Emergency Medical Service (EMS) organizations carry naloxone. However, these are not the only changes. Several states have begun to adopt new laws and policies to make naloxone more available to the public.

Naloxone has shown great success in preventing overdose fatalities, as proven in a variety of studies. The Quincy Police Department has reported well over 200 overdose reversals since officers began carrying naloxone (Beletsky, 2014). Distribution centers that trained laypeople on naloxone and overdose identification were more readily able to identify an overdose, and administer naloxone. Furthermore, it was found that those who were trained on naloxone and overdose recognition were comparable to medical experts in identifying overdose situations, thus demonstrating the positive impact of these distribution centers (Green et al., 2008). Lastly, a group conducted a case study on naloxone use. Two prisoners, both opiate users recently released from prison, were given a naloxone kit, and training on overdose prevention. Both patients ended up overdosing on heroin, and self-administered the naloxone to reverse the overdose effects. Although both patients self-administered the naloxone, they were aided at some point in the process. This further demonstrates actual cases where naloxone was utilized to save a life from overdosing. However, one of the patients tried to seek treatment, but ultimately ended up back in the prison system (Green et al., 2014). This demonstrates a limitation of naloxone on drug use.

The Controversy of Nalxone

As naloxone has become more available to the public, there has been increasing controversy over the drug. The controversy varies from different ethical and legal standpoints. More and more states have adopted Good Samaritan Laws, which serve to protect those who call 911 in the event of an overdose from arrest. Some believe that naloxone will serve as an enabler to drug use. Others disagree with the Good Samaritan Laws, since illegal drug use is still occurring. There is also the safety concern for first responders at a drug overdose. It is not uncommon for the person who overdosed, to become violent when given naloxone. The controversy of naloxone is present not only among first responders, but among the public as well.

A group of police officers and paramedics were surveyed in Seattle, Washington. It was found that the majority of police officers were not familiar with Washington's Good Samaritan Law. The majority felt it was important to remain on the scene for the safety of medical personnel, compared to law enforcement reasons. About half believed that neither the user nor the witness should be able to administer naloxone, and about half were against the immunity provision of the Good Samaritan Law. Lastly, only about a quarter were in favor of bystanders utilizing naloxone. Officers cited that they felt bystanders using naloxone may lead to incorrect administration, and should only be given by medical professionals. Interestingly enough, the majority of paramedics surveyed were not familiar with Good Samaritan Law either. The paramedics also believed that police should be present at an overdose incident for their safety (Banta-Green et al., 2014).

Although naloxone has been widely adopted by first responders, some organizations refuse to still utilize this public health tool. Officers have been cited saying that they are uncomfortable giving naloxone, since they are not medical professionals. They are worried

about law suits occurring. Other officers have indicated that naloxone can be seen as a "get out of jail free card." There have also been reports of reviving the same person over and over again, which further enforces the idea of enabling (Green et al., 2013).

However, more research needs to be done on such naloxone programs: how many times have people been revived, how many of those revived have gone on to treatment, or how many have died since receiving naloxone. While naloxone kits can be relatively cheap ($22-$60), the costs can add up (Beletsky, 2014). Again, looking at the 280 overdoses that were reversed cost the Quincy police department at least $6,000. This last problem is of major importance, as naloxone prices continue to rise. There are a limited number of manufacturers that produce the drug, especially in the intranasal form. The intranasal is easier to administer compared to an intravenous method, and thus can be administered by police and laypersons. The intranasal injectable Narcan, produced by Amphastar, cost $20.39 in 2009, and has since increased to $39.60 in 2016. These increases have still happened although the FDA quickly approved new forms of naloxone to be used by the populous. With increased prices of naloxone products occurring, the government may need to begin purchasing the drug in bulk, or offering incentives to lower the cost (Gupta et al., 2016). The increase in cost will make it harder for organizations to continue to purchase naloxone, which can ultimately lead to organizations disuse of the product.

Berks County: A Case Study

With opioids receiving more attention, the state of Pennsylvania has already begun to work on efforts to aid in the opioid epidemic. Governor Wolf has made it so that the Pennsylvania State Police carries naloxone (Governor.PA.gov, 2015). Naloxone is also being

made more available to the public. In 2014, Pennsylvania passed Act 139. This act allowed all first responders to administer naloxone to someone experiencing an opioid overdose. Part of Act 139's directives involved giving families access to naloxone with a prescription. This would be helpful to those families who may have someone in the family that uses heroin, and is at risk of an opioid overdose. About a year later, the physician general of Pennsylvania signed a standing order on naloxone (Governor.PA.gov, 2015). This meant that all Pennsylvanians could now access Narcan at any pharmacy that has the drug in stock, such as CVS. Act 139 also served to expand on the Good Samaritan laws that were currently in effect. This means that those who report or attempt to reverse a drug overdose would be immune from prosecution (health.PA.gov, 2015).

Berks County has over 400,000 residents currently living in rural, suburban, and urban environments (census.gov, 2016). The county has 72 municipalities (co.berks.pa.us, 2017). It is also the home of Albright College. The county only has one central authority on substance abuse and addiction: the Council on Chemical Abuse. This organization provides resources and information regarding the various types of chemical substances. They have an entire page dedicated to opioid prevention. In fact, the council provides Narcan kits free of charge, upon completion of an online training program (Council on Chemical Abuse.org, 2017). Furthermore, Governor Wolf's office partnered with Adapt Pharma to provide high schools across the state with a free Narcan kit. However, only three schools (Reading Muhlenberg Career Technology Center, Muhlenberg High School, and Muhlenberg Middle School) in all of Berks County have applied to this program, which is an extremely low number considering overdoses happen across all ages (health.pa.gov, 2017). Unfortunately, even with these measures in place, there is still a rise in overdoses in the state and the county.

Therefore, I wanted to gain a better idea of the views of naloxone and the opioid epidemic in Berks County. My study involved interviewing people in different positions in the county, such as clinical treatment, political, and law enforcement.

Interview 1: Mike Reese

Mike is an independent contractor with the Council on Chemical Abuse (COCA). Mike is a certified recovery specialist in Pennsylvania, and is also trained to give Narcan. His recent work with COCA was under the Treatment Access and Services Center (TASC) through what is known as the Warm Hand-Off program. His job involved being on-call once a week, for one week a month. If there was an overdose that was reversed, he would get called to the emergency department at the hospital. He serves as the intermediate between emergency medicine and obtaining potential access to treatment services. Mike explains to the patient what the program entails, and how he can help them obtain treatment. He explains to the patient that he himself went through treatment for his own addiction (which was not heroin or opioid related). If the patient agrees to undergo treatment, because they are able to decline, then Mike works to get them into a treatment program.

Mike indicated that the first choice is Reading Hospital. Sometimes though it is hard to find a bed for patients that want treatment. He also said that is not uncommon for patients to leave treatment within a couple of days. Mike said that withdraw will not kill the patient, however, it certainly feels like it can kill you. He said that patients are more likely to enter treatment after experiencing a near death situation. The "warm hand-off" allows for this intervention to happen sooner rather than later. Otherwise, the patient receives something in the Emergency Department to help with the withdraw symptoms. This is then only a temporary solution, and can lead to the patient using again.

Mike believes that the heroin epidemic is getting worse. He cites the *Reading Eagle* as an indication of the increasing overdose deaths. He has also witnessed this during his time with TASC, as an independent contractor. He believes that heroin is more potent today than in previous years, which adds to the addiction factor. He said that ingredients, such as fentanyl, are being laced with the heroin. He says that it has caused people who have been using for years to overdose.

Part of his time has also focused on reaching out to first responders. Mike is aware of Narcan, and believes that it is a proven drug to reverse opioid overdoses. He wants people to have access to the drug, since it is non-habit forming. He really wants first responders to adopt the use of Narcan. He said that some places he reached out to are willing to use Narcan and already have it at their organization's disposal. However, some departments are hesitant to use Narcan. One organization said it was a safety concern to use Narcan, since it reverses that person's drug high. By reversing their drug high, the person may become violent and lash out against the first responders. Another organization, that already has Narcan, reported having to use the drug on the same person multiple times. While Mike does see Narcan as a problem for "frequent flyers" (people that commonly utilize EMS, and in this case have received Narcan more than once), he believes that it can still be an effective tool. He wants first responders to have more information and education regarding addiction and substance abuse, as he feels that this group still views substance abusers as second-class citizens.

Lastly, Mike discussed some points on helping with the opioid epidemic. From his time in the Warm Hand-Off program, he says that most people became addicted to pain killers following a surgery or injury. The patient was treated with pain killers to take away the pain, but then became addicted. He does put some blame on doctors who prescribe the drugs, and on

pharmaceutical companies, since they sell the drugs for profit. He would like to see more treatment centers, and said that a third treatment center is opening in Berks County. Mike would like to see more alternative pain management treatment (massage therapy, meditation, chiropractor) become available, and covered by insurance. He believes that this will lessen the amount of prescriptions that doctors write, and thus lower the demand for heroin. While law enforcement can help with lowering the supply, he believes they can only do so much, especially due to the cheap cost of heroin ($30-$40 a bundle).

Interview 2: Lauri Renick

Lauri is the clinical supervisor at the Gate House for Men. The Gate House is a halfway house for people recovering from substance abuse in Lititz, PA. Although not within Berks County, several Berks County residents utilize this facility, as there is no halfway house in Berks County. Patients can stay at the house for three months. During their time, patients undergo therapy, work towards re-integration, and look for a job. The men's facility houses 26 men, and the women's facility houses 26 women. The men's house is mostly white (most likely due the region), but has a broad age range. It is also only available to those using public-funded insurance. Private insurance companies do not recognize the halfway house. Lauri's educational background to be a clinical specialist involves a bachelor's in psychology (hers is from Albright College), and a certification in Alcohol and Drug counseling through the Pennsylvania Certification Board. Specifically, for her position of Clinical Supervisor, she is required by the state to have three years of counseling experience. Although an administrator, she still oversees a small case load of patients that are recovering. She stated that about 80% of the patients are at the halfway house for opioid use.

Lauri also believes that the opioid epidemic is getting worse. She says that people are more likely to die today, compared to when she was an addict years ago. She says that the drugs often have additives to make them stronger, which leads to the overdoses. Lauri also indicated that the medical community plays a role in the opioid epidemic. She cited a statistic from the Substance Abuse and Mental Health Services Administration: 4 out of 5 new users are due to initially being prescribed pain medications. She does believe that individuals have choices in life, but those choices "go out the window" when addiction sets in.

She says that all the staff at the Gate House are trained to use naloxone, including herself. She said that there are Narcan kits on-site in case of an emergency, since residents are able to come and go from the facility. Fortunately, no one has had to use their Narcan kit yet. Lauri believes that naloxone is "effective in keeping people alive" but is "not a treatment." She says there are some problems surrounding naloxone. She said that sometimes it takes more than one dose to reverse the opioids, and that people can be angry coming out of an overdose. However, she does believe that it is fairly easy to use and should be accessible to the public at a reduced cost. Lastly, she said that naloxone is great for families and health professionals, but does not think the availability helps the user themselves.

Lauri would like to see more access and education to prevent drug addiction. She would like to see another men's facility open, since their facility often has a waiting list of 15-20 people. Long-term treatment is also needed, as three months is too short of a time for patients. The difficulty is finding insurance companies, and other public funds to pay for the long term treatment programs. She said that research has shown that the longer someone is drug free, the more successful they are at staying abstinent. Lauri said that this is especially important since a person's tolerance decreases during treatment. Therefore, if they undergo treatment and then

begin using again, they are very susceptible to overdosing. Lauri would also like to see different programs to treat patients that have a more holistic focus, including using medication, as each patient responds to different treatments. She feels that the current system does not correct the problem, and only treats the symptoms. She mentioned about how a doctor who was giving a seminar received less than a day's worth of education on addiction. This can again point to the stigma that surrounds drug use and addiction.

One last talking point that Lauri discussed was drug court. Drug court is an alternative option for non-violent drug crimes to the regular judicial system. Those who participate in drug court undergo drug testing and therapy, as well as a parole period. This lasts for a period of time, and those who are successful can have their current sentence expunged. Drug court only expunges the current sentence. Lauri mentioned that she went through drug court and found it be very beneficial but difficult. She would like to see more areas adopt the principles of the drug court, as it can keep people out of prison. This then saves the state and county money.

Interview 3: Judy Schwank

Judy Schwank is the District 11 (which includes Berks County) state senator of Pennsylvania. Senator Schwank's position is based on an election system at the state level. Senator Schwank has been in office since 2011, and her term ends in 2020. Her job involves passing legislation, communicating with others at the state level, and assisting in passing the state budget.

Senator Schwank believes that the opioid epidemic is a public health crisis, and that it is getting worse. She said it started a few years ago when she received a call from a physician in a rural area regarding a high school graduate that had overdosed on heroin. This led to meetings at

the community level, which have since grown to become a problem recognized at the state level. She believes that this is also a social justice issue, as more and more people of different race/socioeconomic status are affected this issue has been labeled as an epidemic. Senator Schwank says that the epidemic is getting worse based on the current statistics (cited the *Reading Eagle*'s article on the increasing number of overdoses statewide), the increased number of phone calls on the subject, and the heightened level of interest in legislation. Specifically, she used statistics reported from the physician general regarding Berks County. Berks County has a "16.2 per 100,000 incidence of drug overdoses in 2016," which has been increasing over the past couple of years.

Senator Schwank is familiar with naloxone and has a sample training kit. She sees naloxone as a lifesaving tool that should be widely available, especially at home for families. She feels that requiring training to obtain naloxone would lead to less use of the drug by the public, and thinks that administering naloxone through the nose is not very complicated. However, it was noted that EMS providers have commented about seeing the same person multiple times for an overdose after utilizing naloxone, which is a burden on the healthcare system.

Personally, the senator has introduced legislation to review current treatment programs. She believes in alternative treatment programs, including medication-assisted ones. This also includes having more options for treatment in general, extending the length of time for treatment, and more research to understand addiction. She also wants more education on opioids for youth and adults to prevent drug use. Senator Schwank says she is not sure of the exact answer, and what it will look like, but believes more access is needed. She does believe that the Affordable

Care Act was able to create some of this access for people, as well. She did mention about the Warm Hand-Off program having a successful impact on getting people into treatment.

Unfortunately, this issue has affected others in a negative way. It impedes others who need prescription medications to manage pain, as doctors are starting to follow guidelines that avoid prescribing opioid pain killers. Lastly, she mentioned that there is legislation in the early phases that would mandate people into treatment. She says that she is currently waiting to see more information on this new potential legislation before choosing a side.

Interview 4: John Adams

John Adams is the District Attorney for Berks County. The job position requires a law degree. His job entails being the chief law enforcement officer for the county, prosecuting criminal offenders, and leading all police departments to work together.

Adams said that there was a public outcry for police and law enforcement to become more involved in the opioid epidemic. This led to various insurance companies donating Narcan to police departments, as well as police being trained to carry and administer Narcan. About six months after Act 139 was passed, Narcan was added as a tool to the District Attorney's Office. All detectives, and Adams, carry Narcan. He stated that the law gave officers immunity to administer Narcan. He says that police departments can get trained online to carry Narcan, and that most departments in the county currently carry the drug.

Adams believes that Narcan is a great drug that can save lives. However, he did mention that it has been around for years. Adams also believes that the opioid epidemic is getting worse. However, he believes that the epidemic is starting to peak, based on reports that he receives each month from the drug crime desk. He did mention that the entire county is effected by opioids.

An interactive map shows drug overdose deaths happening in rural areas, suburbs, and cities. While he is accepting of the current access of Narcan to the public, he does have an issue regarding the current Good Samaritan Laws that were defined in Act 139. He says that "an individual can overdose and be brought back, but can decline treatment." Adams believes that a state law needs to be enacted to require treatment, or require that one is assessed to determine if treatment is needed, following an overdose reversal.

There was also discussion on increasing enforcement and education services. He believes that the supply from Mexico needs to be cut-off in order to lower the demand for the drug. This can be done through using our current resources more effectively. Meanwhile, youth should be educated in schools in order to prevent drug use from occurring, and doctors should be better trained to prevent overprescribing of opioid medication. However, Adams did mention that the Warm Hand-Off program was very successful, and the only option some people have to obtain treatment. Adams was also able to give insight on the drug court that Lauri had discussed. Berks County, like Lancaster County, does have a drug court. He believes that it is an effective program for some people, however, there are some who relapse. People can typically only go through drug court once.

Discussion

There is some definite overlap between each person I interviewed. All interviewees believed that Narcan is an effective tool, but it is not a treatment. Each person also believes in easy access to Narcan in the county, since it can be a lifesaving tool that is relatively easy to utilize. All believe that the opioid epidemic is worsening in the county and the state. However, each person believes there is a different way to aid in the addiction problem from their point of view. This demonstrates a lack of communication between the various groups on this public

health issue. The lack of communication can negatively impact how the opioid epidemic is handled, which may lead to more overdoses.

Lauri and Mike directly interact with patients that are addicted or have overdosed. They are calling for more access to alternative therapies, more long-term care, and more treatment centers. Mike also mentioned the mixed reviews he received when going to different first responder agencies, which shows that not everyone is on board with the use of Narcan in the county. Mike wants more people to know about Narcan, and for first responders to receive more education on addiction and drug abuse. Lauri wants more education as a whole to prevent addiction, especially in the medical professions.

Senator Schwank, a senator for the people of Pennsylvania, wants more healthcare access for people, more medication-assisted treatment, and further research on addiction. Since Senator Schwank's role focuses on the political realm, she is in a position that focuses on policy and appropriating public funds for these policies. Therefore, Senator Schwank serves as an important figure in determining forward progress for addiction services. Unfortunately, she has indicated that she is not entirely certain of what the right answer is to solve this problem.

Lastly, District Attorney Adams believes that enforcement and education are the most effective ways to handle this problem. Primarily, Adams wants to focus education on youth in schools, and on doctors to prevent overprescribing. While more education can better inform people of the danger of opioids, more enforcement may not work based on the current state of the Drug War. Adams also believes in mandating people that have overdosed to receive treatment. This can serve as an ethical dilemma, since one's rights are being taken away. However, one may argue that the person is mentally unable to make the decision to deny treatment.

Moving forward, more communication among different groups with varied backgrounds can help create a better plan of action towards the opioid epidemic. The county already has a couple of resources available that could be expanded upon. The Council on Chemical Abuse partnered with TASC to create the Warm Hand-Off Program, which each interviewee cited as a successful program. Following an overdose episode, the patient can meet with a representative from TASC to work on getting enrolled in a treatment program. While it is the patient's choice to meet with the person from TASC, and to go into treatment, this type of intervention has proved useful to get people into treatment. There is also the drug court, which Lauri herself went through. Lauri is a strong proponent of the drug court, as it prevents people from entering the prison system, thus continuing the cycle of drug abuse. Drug court is an alternative for non-violent drug offenses. The person receives treatment and is tested regularly for drugs. Upon rehabilitation from drug court, the person's sentence is expunged. Adams believes that the drug court is an effective alternative option to prevent another person from going to jail.

There are various views based on each person's background. Each person has a distinct idea of how to handle the opioid epidemic. By combining the different ideas and creating an effective communication among the clinical, political, and law enforcement realms, better public health approaches can be created and implemented. This could lead to a reduction in the number of deaths associated by overdose, number of overdoses, and the amount of people that use opioids. Focusing on integrated treatment and prevention methods will help achieve these goals.

Current and Future Directions

The Affordable Care Act (ACA) was passed in 2010, which was designed to increase healthcare access to the populous through purchasable insurance. The bill involved various

aspects, such as requiring everyone to obtain insurance, insurance companies no longer being able to reject applicants based on pre-existing medical conditions, and a set of minimum requirements for insurance plans to cover. Part of the ACA's minimal standards for insurance coverage requires mental and behavioral health benefits. This includes providing treatment for substance abuse disorders and inpatient services (HealthCare.gov, 2017). This legislation allows Americans to receive the treatment they need, while still being covered under insurance.

However, with the new presidency of Donald Trump, there have been calls to repeal and replace the ACA. The new plan calls to eliminate the mandated mental health services provided through Medicaid (Zezima and Ingraham, 2017). Senator Schwank believed heavily in the ACA to provide access to millions of Americans, and fears the negative impact if the bill were to be repealed. A repeal of the ACA would result in 2 million Americans, who have a substance abuse disorder covered by the ACA, to be without insurance coverage (Friedmann et al., 2017). Without insurance, these people are now unable to effectively pay for their treatment. The repeal of the ACA would also negatively impact rural areas the most. While Berks County has rural areas, the majority of the county is not considered rural (over 95%) according to the Rural-Urban Commuting Area Codes (United States Department of Agriculture.gov). These changes at the political level would be a step backwards towards ending the opioid epidemic. Fortunately, the current bill to repeal the ACA has been rejected by congress.

In 2016, Congress passed the Comprehensive Addiction and Recovery Act (CARA). This landmark policy calls for an extension of treatment and prevention services to fight the opioid epidemic. There are three main components to the policy: expanded use of naloxone by first responders and the community, expanded provision of medication-assisted treatments (i.e. methadone), and expansion of Law Enforcement Assisted Diversion to direct low-level drug

offenders into treatment instead of the prison system. While all of these provisions to the policy are steps in the right direction, there is currently no federal funding for the bill. Repealing the ACA and lack of funding for CARA demonstrate the power of the politicians in public health matters. Politicians can greatly influence the outcome of the opioid epidemic based on the policies they enact and fund.

More needs to be done moving forward to stop the use of opioids, and overdose deaths. Besides changing views of drug use, and effective communication among groups, there needs to be a greater focus on public health interventions. Prevention is key in stopping the opioid epidemic, as it breaks the cycle of drug abuse in the US, which effectively decreases the number of overdoses. Primary intervention tactics, such as medication take-back programs, involve collecting leftover prescription medications to be properly disposed. The result is less prescription medications in circulation in the public. There is also increasing monitoring measures on prescription medications to prevent overprescribing by physicians (Hawk et al., 2015). Pennsylvania has already taken steps towards increased monitoring measures. Act 191 of 2014 created a statewide prescription monitoring program for medical prescribers and dispensers. There has also been the formation of the Safe and Effective Prescribing Practices Task Force under the Department of Health and the Department of Drug and Alcohol Programs. This task force has created prescribing guidelines for opioids in cancer, dentistry, emergency medicine, geriatrics, and sports medicine (healt.PA.gov, 2017) Steps can even be taken towards ending the Drug War. This could involve changing current enforcement laws, or increasing opportunities to participate in drug court (Jonas, 2016).

Education can provide a great impact on the opioid epidemic. Informing people further about drug use and addiction can aid in preventing drug use, identifying signs of drug use,

understanding how addiction works, even change perceptions of drug use. Further education has proven to have a positive impact on the opioid epidemic. The framework of these education tactics could be modeled after the Smoking Cessation Campaign, which has been very successful in reducing the number of people who smoke tobacco in the U.S. (Jonas, 2016). Naloxone distribution programs have demonstrated that trained laypeople can properly identify an overdose and can take steps to reverse it (Green et al., 2008). This can also be applied to naloxone in general. People that were exposed to factual information and sympathetic narratives were more likely to support naloxone training for first responders, support provisions of naloxone for families and friends of opioid users, and support the passing of Good Samaritan laws to protect people that administer naloxone to someone overdosing (Bachhuber et al., 2015). However, further training is needed for first responders on addiction and overdose. It has been found that EMS providers are less likely to administer naloxone to overdose victims when patients were older, female, or lacking signs of drug abuse. These are missed opportunities to save someone's life, which can be avoided through further education of EMS personnel (Summer et al., 2016).

Secondary intervention mainly focuses on screening. Screening opportunities, such as meeting with counselors, or completing questionnaires can determine risk and risk factors. There are a variety of tertiary interventions that can be utilized as well. These include expanding Good Samaritan Laws for the public and first responders for immunity from drug charges and for saving someone else's life. Naloxone can also become more accessible, but the rising prices needs to be addressed first. Then there is increased access to treatment. As Lauri and Mike have indicated, a more holistic approach is needed, since people respond to different treatments. Lauri also believes that longer care periods beyond three months are needed. This would require

further coverage by insurance companies, which could potentially be mandated through an expansion of ACA minimal insurance requirements. Then there is treatment through medication-assistance. This involves therapies, such as methadone or buprenorphine. Medication-assistance therapy involves using an opioid similar chemical that reduces the craving and withdrawal symptoms, while the patient can undergo counseling services (Hawk et al., 2015). Lastly, further research needs to be done on addiction, drug abuse, and brain interactions with drug use. Federal agencies can provide resources and funding for these interventions to then be implemented at the state and local levels.

Conclusion:

There are a variety of components that have affected and created the opioid epidemic. There social, historical, and legal factors that have provided the framework of the Drug War. Increased legislation over a long period of time has created a stigmatized view of drug use, and a bias against different minority groups. The Drug War has proven to be a failure, as thousands have been arrested, while the overdose rates continue to increase. As the current state of overdoses by opioids continues to increase, the U.S. has declared a public health emergency. This has led to attempts to increase public health interventions to lower the overdose rates in the US. Naloxone has begun to be readily used by organizations, and has become a popular choice over the past several years. However, naloxone is only an effective tool to stop someone from dying. It does not treat the source of addiction. There needs to be further access and research to treat and understand addiction.

My case study of Berks County has demonstrated that the opioid epidemic is increasing in this region. My interviews were able to shed light on the matter of opioid and naloxone use in

the county. While all parties have agreed that naloxone is an effective tool, they have indicated it is not a treatment. Therefore, increased access to naloxone would be beneficial to the community. However, this increased access should be supplied with useful information to better inform the populous of opioid abuse. The problem is that each interviewee believes in a different way to stop this growing problem. This demonstrates a lack of communication between different groups on solving a public health problem. This is important as public health is a very integrated approach to solving health problems at the population level. Communication will be key among these different groups to establish new policies that expand healthcare access, provide funding for passed policies, and continue research projects on addiction. It will be important to monitor, evaluate, and adjust these public health interventions, as they become implemented moving forward. The focus needs to be one that is integrated and public health focused to effectively end the opioid epidemic in the region and the US.

Literature Cited

Adams J. 2017, February 21. Personal Interview.

Banta-Green C, Beletsky L, Schoeppe J, Coffin P, and Kuszler P. 2013. Police Officers' and Paramedics' Experiences with Overdose and their Knowledge and Opinions of Washington State's Drug Overdose-Naloxone-Good Samaritan Law. *Journal of Urban Health* 90(6): 1102-1111.

Beletsky L. 2014. Engaging Law Enforcement in Opioid Response: Frequently Asked Questions. *US Department of Justice* [Internet]. Available from: http://getnaloxonenow.org/Engaging%20Law%20Enforcement%20in%20Opioid%20Overdose%20Response_Frequently%20Asked%20Questions.pdf.

Brownstein M. 1993. A Brief History of Opiates, Opioid Peptides, and Opioid Receptors. *Proceedings of the National Academy of Sciences of the United States of America* 90(12): 5391-5393.

Definition of Addiction. American Society of Addiction Medicine [Internet]; [modified 19 April 2011; cited 31 March 2017]. Available from: http://www.asam.org/quality-practice/definition-of-addiction.

Friedmann P, Andrews Christina, and Humphreys K. 2017. How ACA Repeal Would Worsen the Opioid Epidemic. *The New England Journal of Medicine* 367(10).

Gieringer D. 2009. The Opium Exclusion Act of 1909. *Counter Punch* [Internet]. Available from: http://www.counterpunch.org/2009/02/06/the-opium-exclusion-act-of-1909/.

Green T, Heimer R, and Grau L. 2008. Distinguishing signs of opioid overdose and indication for naloxone: an evaluation of six overdose training and naloxone distribution program in the United States. *Addiction* 103(6): 979-989.

Green T, Ray M, Bowman S, McKenzie M, and Rich J. Two cases of intranasal naloxone self-administration in opioid overdose. *Substance Abuse* 35(2): 129-132.

Green T, Zaller N, Palacios W, Bowman S, Ray M, Heimer R, and Case P. 2013. Law enforcement attitudes towards prevention and response. *Drug Alcohol Dependence* 133(2): 677-684.

Gruber S, Silveri M, and Yurgelun-Todd D. 2007. Neuropsychological Consequences of Opiate Use. *Neuropsychological Review* 17: 299-315.

Gupta R, Shah N, Ross J. 2016. The Rising Price of Naloxone—Risks to Efforts to Stem Overdose Deaths. *The New England Journal of Medicine* 375(23): 2213-2215.

Hall A and Coyne C. 2013. The Militarization of US Domestic Policing. *The Independent Review* 17(4): 485-504.

Hawk K, Vaca F, and D'Onofrio G. 2015. Reducing Fatal Opioid Overdose: Prevention, Treatment and Harm Reduction Strategies. *Yale Journal of Biology and Medicine* 88(3): 235-245.

Information Sheet on Opioid Overdose. World Health Organization (WHO) [Internet]; [cited 3 March 2017]. Available from: http://www.who.int/substance_abuse/information-sheet/en/.

Injection Safety: Drug Diversion. Centers for Disease Control and Prevention [Internet]; [modified 30 August 2016; cited 16 April 2017]. Available from: https://www.cdc.gov/injectionsafety/drugdiversion/.

Jonas S. 2016. *Ending the "Drug War;" Solving the Drug Problem.* Brewster (NY): Punto Publishing Press, LLC.

Lowinson J, Ruiz P, Millman B, and Langrod J. 2005. *Substance Abuse: A Comprehensive Textbook* 4th ed. Philadelphia (PA): Lippincott Williams & Wilkins.

Mental Health and Substance Abuse Coverage. US Centers for Medicare and Medicaid [Internet]; [cited 31 March 2017]. Available from: https://www.healthcare.gov/coverage/mental-health-substance-abuse-coverage/.

Municipalities. County of Berks: Pennsylvania [Internet]; [cited 31 March 2017]. Available from: http://www.co.berks.pa.us/muni/pages/default.aspx.

Naloxone Info. Naloxone Frequently Asked Questions. Naloxone Info [Internet]. Available from: http://naloxoneinfo.org/sites/default/files/Frequently%20Asked%20Questions-Naloxone_EN.pdf.

Naloxone Program for Schools. Pennsylvania Department of Health [Internet]; [modified 12 December 2016; cited 31 March 2017]. Available from: http://www.health.pa.gov/My%20Health/School%20Health/Pages/Narcan-Program-in-Schools.aspx#.WOBcV_nyvIX.

Newman T and Smith G. 2016. Congress passes landmark opioid bill –the Comprehensive Addiction and Recovery Act (CARA). *Drug Policy Alliance* [Internet]; [cited 31 March 2017]. Available from: http://www.drugpolicy.org/news/2016/07/congress-passes-landmark-opioid-bill-comprehensive-addiction-and-recovery-act-cara.

Newsroom. 2015. Governor Wolf Announces Naloxone Standing Order to Combat Heroin Epidemic. Governor.PA [Internet]. Available from: https://www.governor.pa.gov/naloxone-standing-order/.

Opiates (Narcotics): Addiction, Withdrawal, and Recovery. Addictions and Recovery [Internet]; [modified 20 May 2016; cited 3 March 2017]. Available from: http://www.addictionsandrecovery.org/opiates-narcotics-recovery.htm.

The Opioid Epidemic. Pennsylvania Department of Health [Internet]; [cited 31 March 2017]. Available from: http://www.health.pa.gov/My%20Health/Diseases%20and%20Conditions/M-P/opioids/Pages/default.aspx#.WPQ5QtLyvIU.

Opioid Overdose Prevention. Council on Chemical Abuse [Internet]; [modified 2017; cited 31 March 2017]. Available from: http://www.councilonchemicalabuse.org/prevention-reading-pa/opioid-overdose-prevention.html.

Opioids. Substance Abuse and Mental Health Service Administration [Internet]; [modified 23 February 2016; cited 31 March 2017]. Available from: https://www.samhsa.gov/atod/opioids.

Painkillers: A Short History. A Foundation for a Drug-Free World [Internet]; [cited 3 March 2017]. Available from: http://www.drugfreeworld.org/drugfacts/painkillers/a-short-history.html.

Quick Facts Berks County, Pennsylvania. United States Census Bureau [Internet]; [modified 1 July 2016; cited 31 March 2017]. Available from: https://www.census.gov/quickfacts/table/RHI405210/42011.

Reece J, Urry L, Cain M, Wasserman S, Minorsky P, and Jackson R. 2011. *Campbell Biology*, 9th ed. Boston (MA): Pearson Education.

Reese M. 2017, January 30. Personal Interview.

Renick L. 2017, February 6. Personal Interview.

Rowe C, Santos G, Vittinghoff E, Wheeler E, Davidson P, and Coffin P. 2015. Predictors of participant engagement and naloxone utilization in a community-based naloxone distribution program. *Addiction* 110(8): 1301-1310.

Rural-Urban Commuting Area Codes. United States Department of Agriculture: Economic Research Service [Internet]; [modified 12 October 2016; cited 16 April 2017]. Available from: https://www.ers.usda.gov/data-products/rural-urban-commuting-area-codes/.

Sacco L. 2014. Drug Enforcement in the United States: History, Policy, and Trends. *Congressional Research Service* [Internet]. Available from: https://fas.org/sgp/crs/misc/R43749.pdf.

Schwank J. 2017, February 17. Personal Interview.

Summer S, Mercado-Crespo M, Spelke M, Paulozzi L, Sugerman D, Hillis S, and Stanley C. 2016. Use of Naloxone by Emergency Medical Services During Opioid Drug Overdose Resuscitation Efforts. *Prehospital Emergency Care* 20(2): 220-225.

Taxy S, Samuels J, and Adams W. 2015. Drug Offenders in Federal Prison: Estimates of Characteristics Based on Linked Data. *Bureau of Justice Statistics* [Internet]. Available from: https://www.bjs.gov/content/pub/pdf/dofp12.pdf.

Turner F. 2016. Heroin-related Deaths in Berks County up in first half of 2016. *Reading Eagle* [Internet]. Available from: http://www.readingeagle.com/news/article/heroin-related-deaths-in-berks-county-up-in-first-half-of-2016&template=mobileart.

Turner F. 2016. Overdose Deaths Up Nearly 25%. *Reading Eagle* [Internet]. Available from: http://www.readingeagle.com/news/article/overdose-deaths-up-nearly-25.

Types of Prevention: Three Levels. Virtual Campus for Public Health [Internet]; [cited 31 March 2017]. Available from: https://cursos.campusvirtualsp.org/mod/tab/view.php?id=23157.

Zezima K and Ingraham C. 2017. GOP health-care bill would drop addiction treatment mandate covering 1.3 million Americans. *The Washington Post* [Internet]; [cited 31 March 2017]. Available from: https://www.washingtonpost.com/news/wonk/wp/2017/03/09/gop-

health-care-bill-would-drop-mental-health-coverage-mandate-covering-1-3-million-americans/?utm_term=.82ef652f3291.