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Evaluating the Effects of Safe Injection Facility Legalization on Fatal and Non-Fatal Overdose and Infectious Disease

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**Evaluating the Effects of Safe Injection Facility Legalization
on Fatal and Non-Fatal Overdose and Infectious Disease**

Olivia M. Ramirez

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For Aundre, who's struggle taught me compassion, understanding and the pain of loving someone with an addiction. For Aundre, who always helped others, especially those who were smaller, quieter or weaker. For Aundre: my inspiration, my teacher, my friend, my brother.

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ABSTRACT

In 2017, 70,000 lives were lost to fatal drug overdoses with approximately 46,000 of those involving the use of prescription and illicit opioids (CDC, 2018b). Unaddressed, the opioid epidemic is costing large amounts of money, lost productivity and valuable lives.

Injection drug use has also become increasingly common in the United States, as it is an efficient means of consuming opioids. Unfortunately, injecting drugs is also an efficient method of transmitting bloodborne diseases. Estimates show that in the United States, 8% of all new HIV infections in 2010 and 22% of all adults and adolescents with HIV resulted from injection drug use (Lansky, 2014). Injecting drugs isn't as uncommon as some might think. Though it can be difficult to estimate the number of people who inject drugs, it has been reported somewhere between 4.5 and 8.6 million people inject drugs (Lansky, 2014). As there has been an increase in this behavior, the prevalence of infectious diseases spread through contact with blood have increased (Meiman, 2015). The continued rise in rates of injection drug use (IDU), and subsequent infectious disease indicate the need for a response from the United States government. One evidence-based strategy for reducing the health consequences of injection drug use is the implementation of safe injection facilities, which have been legalized and/or decriminalized in the Netherlands, Norway, Canada and 9 other nations. In this capstone, I will examine the potential impacts of legalizing safe injection facilities in the United States on non-fatal overdose, fatal overdose, HCV and HIV. I will also discuss the current United States federal law that would need to change or not be enforced in order to open and operate safe injection facilities without risk of prosecution.

INTRODUCTION

A consequence of the opioid crisis has been the proliferation of infectious diseases. As consumption of opioids has risen, so have rates of IDU (Lansky, 2014). Increased IDU means more sharing and reusing of syringes and injection materials like cookers and cotton, which then increases the risk of infection transmission. As a result, rates of diseases like HIV, HCV, endocarditis, osteomyelitis and others have increased sharply.

As the opioid crisis continues in the United States, evidence-based solutions must be implemented to reduce rates of non-fatal and fatal overdose and infectious disease. Prevention, treatment and education are important tools to addressing these issues, but harm reduction, an evidence-based public health strategy, should also be deployed. Harm reduction services have been proven across the country and around the world to be successful in reducing rates of non-fatal and fatal overdoses, infectious diseases and have been shown to increase initiation into addiction treatment (Fitzgerald, 2017). In 12 countries around the world, safe injection facilities have been established as a means of accomplishing this goal (Drug Policy Alliance, 2019).

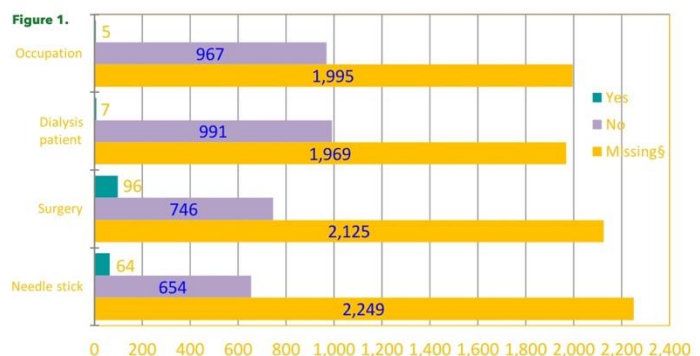
BACKGROUND

In 1996, Purdue Pharma began manufacturing and marketing OxyContin for the treatment of pain; by 2001 it had become the most prescribed narcotic pain reliever in the United States (Van Zee, 2009). In 2001, The Joint Commission issued new standards on the treatment of pain, identifying pain as the “fifth vital sign” (Zimmerman, 2017). This meant that physicians would be judged by patients on their perceived effectiveness at addressing and treating pain in customer satisfaction surveys. Those ratings would be utilized by the Centers for Medicare and Medicaid Services to modify provider reimbursement. The development of Oxycontin and the Joint Commission’s new standards on treating pain created conditions that enabled a rise in

prescribing of opioids to treat chronic pain, which put these addictive substances into the hands of many more patients and put them at increased risk for developing a substance use disorder (CDC, 2017a).

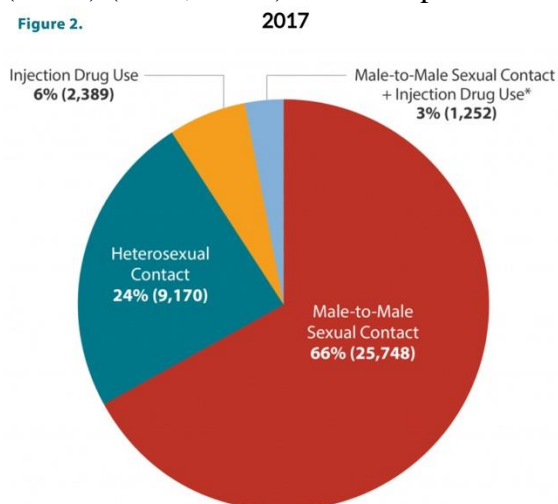
The abuse of prescription opioids was initially seen as a new trend in drug use by providers, who were increasingly encountering patients with opioid use disorders. It quickly became an epidemic impacting the lives of millions of people across the United States. According to the National Institute on Drug Abuse, in 2017 approximately 1.7 million Americans suffered with opioid use disorders (NIDA, 2017). Substance use disorders impact more than just the people in active addiction; they affect families, friends and the community at large.

HCV is the most common infectious disease transmitted through IDU. In the United States, the number of cases of acute HCV reported from 2010 through 2013 increased by 151%, and these increases have occurred disproportionately among young persons, 30 years of age or younger, who reside in nonurban areas east of the Mississippi River, particularly within central Appalachia (Peters, 2016). HCV is a bloodborne disease that is transmitted through contact with the blood of a person who has the disease. It causes liver inflammation and left untreated, or with significant delays in treatment, can lead to liver cirrhosis, the need for transplantation or the development of hepatocellular carcinoma, a form of liver cancer (Havens, 2019). Until 1992, the most common means of transmitting the disease was through transplantation of infected organs. Data from 2016 has shown the change in risk/exposure behaviors that result in contraction of



HCV; they are shown in Figure 1 (CDC, 2018e). The definitive treatment of HCV is costly. Treatment typically includes 8 to 12 weeks of daily medication and has a nearly 100% cure rate (Moore, 2019). In 2013, the Food and Drug Administration approved Sovaldi and Olysio, the two most effective medications for the treatment of HCV. Their approval revolutionized the treatment and reduced the risk of side-effects (Henry, 2018). While the treatment is highly effective it is not accessible to much of the United States population because it is extraordinarily costly to healthcare system. Prices can be in the tens of thousands, a 12-week regimen of Sovaldi costs \$84,000 while Olysio, which is taken for 24 to 28 weeks can cost an estimated \$23,000 per month (Henry, 2018). Investing in evidence-based public health interventions that prevent the transmission of HCV would reduce the costs of treatment to the United States healthcare system and individual patients. These increased rates of infectious disease, and changes in risk /exposure behaviors have results in increased spending in treatment and added an additional burden to the United States healthcare system.

Human immunodeficiency virus (HIV) became prevalent in the United States in the mid to late 1970s. HIV is a virus spread through certain bodily fluids, including blood of an infected person, and left untreated can lead to the development of acquired immunodeficiency syndrome (AIDS) (CDC, 2019f). Over the past few decades, rates of HIV had been declining due in part to



the increased availability and accessibility of antiretroviral medication and development of prophylactic medication such as pre-exposure prophylaxis (PrEP) (CDC, 2019f). Figure 2 shows the groups that made up new HIV diagnoses in 2017 (CDC, 2019f). The group at highest risk for

becoming infected with HIV is men who have sex with men (MSM), but PWID are quickly becoming a large portion of new HIV diagnoses (CDC, 2019). Though PWID make up a smaller portion of those who are diagnosed with HIV, the group as a whole has high rates of the disease. With the rise of injection drug use, there has been a rise in rates of HIV among PWID due to the sharing of used syringes and other injection materials and the high-risk sexual behavior often associated with substance use disorders (CDC, 2019b). PWID accounted for 9% of the 39,782 HIV diagnoses in the United States in 2016 (CDC 2019f). According to the CDC, the current lifetime treatment cost of an HIV infection is estimated at \$379,668 (2010 dollars) (CDC, 2017a). Each averted case of HIV not only potentially saves a life, but also saves the healthcare system and individuals \$379,668. Averted infections are not the only way to measure improved outcomes of HIV. Quality-adjusted life years (QALY) gained, an outcome measure that considers both the quality and the quantity of life lived, is another measure (CDC, 2017a).

According to the Harm Reduction Coalition, a national advocacy coalition, harm reduction is a set of strategies which aim to reduce the negative consequences associated with drug use. It is also a movement for social justice built on a belief in, and respect for, the rights of people who use drugs (PWUD). These strategies include syringe service programs, safe injection facilities and other services that reduce syringe sharing, improper disposal of syringes and public drug use (Harm Reduction Coalition, 2019). Although safe injection facilities are considered taboo by some policy makers and individuals, and are currently illegal, in the United States, countless peer reviewed journal articles and studies have shown they accomplish the goals set forth in the definition of harm reduction.

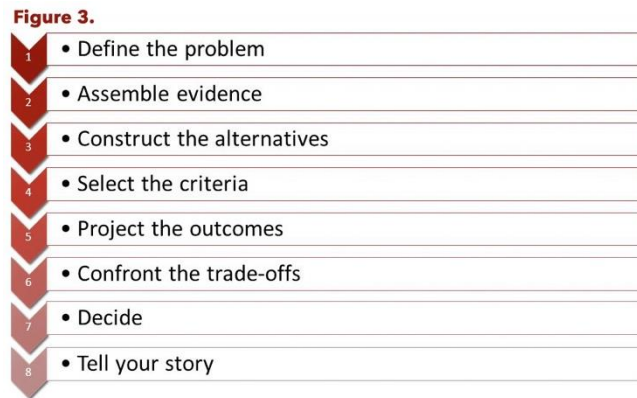
The United States' approach to drug use has focused on criminalization rather than rehabilitation and harm reduction. "Despite strong empirical support for safe injection facilities,

U.S. policymakers have traditionally been resistant to them. Like many other public health-oriented strategies – from needle exchange to heroin-assisted treatment – safe injection sites were long considered to be off-limits in the United States because they were incompatible with the war on drugs” (Kreit, 2019). While the government has relaxed its stance on other public health-oriented strategies such as SSPs, efforts to create safe injection facilities have been met with opposition and ultimately failed. One reason for this outcome could be the common belief that safe injection facilities would violate a federal law, specifically the 1986 Anti-Drug Abuse Act’s “crack house” statute. The statute states that it is unlawful to “knowingly open, lease, rent, use, or maintain any place, whether permanently or temporarily, for the purpose of manufacturing, distributing, or using any controlled substance; manage or control any place, whether permanently or temporarily, either as an owner, lessee, agent, employee, occupant, or mortgagee, and knowingly and intentionally rent, lease, profit from, or make available for use, with or without compensation, the place for the purpose of unlawfully manufacturing, storing, distributing, or using a controlled substance” (Anti-Drug Abuse Act, 1986). At the height of the crack cocaine era and in the early days of the war on drugs, the federal government included language meant to punish those who operated “crack houses.” In doing so, however, they also created a policy that has been used to prevent the implementation of safe injection facilities, whether as a permanent fixture of public health efforts or temporarily as a response to the drug crises. Though people who utilize safe injection facilities do so with illicit drugs procured outside of these facilities, the statute specifically identifies violation of the law as operating for the purpose of drug use. While non-enforcement is an option for circumventing this statute, there is reason to believe that the current federal administration would enforce it. In August 2018, Deputy Attorney General Rod Rosenstein wrote in the *New York Times* that “cities and counties

should expect the Department of Justice to meet the opening of any injection site with swift and aggressive action” (Kreit, 2019). The “crack house” statute, in partnership with the United States’ longstanding policies and approaches to addiction, presents significant barriers to the legalization of safe injection facilities.

METHODS

In this capstone I use Bardach’s eightfold path, shown in Figure 3, as a guide for my assessment (Bardach, 2012). First, I defined the problem in the United States. The issue that was defined was the rise of opioid use disorder, injection drug



use and subsequently, increased rates of bloodborne infectious disease such as HCV and HIV and increased of fatal and non-fatal overdose. Providing that background established that the issue in the United States is a lack of harm reduction measures which are evidence-based in reducing all of these harms.

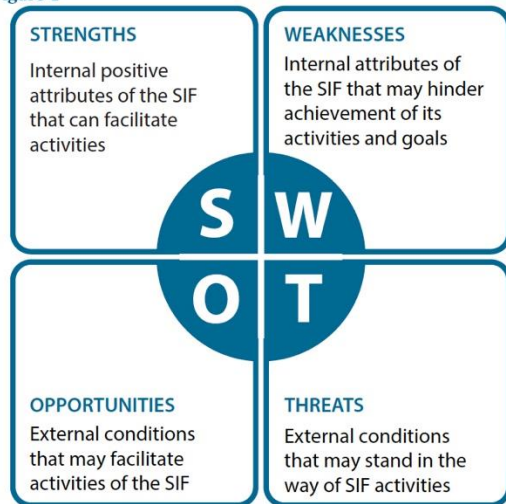
The second step of the eightfold path is to provide evidence of the issue (Bardach, 2012). In the background section, I discussed the significant increase in rates of infectious disease reported by the Centers for Disease Control and Prevention. I also assembled evidence on current policies in the United States which have been assumed would be used to block the legalization of safe injection facilities.

The third step of the guide is to identify alternative solutions for addressing the issues identified in step one (Bardach, 2012). In this policy analysis, that will include identifying solutions that are already in place or have already been attempted as well as policy solutions that

have not been tested and assessing their potential impact. Those solutions will be identified later in the discussion and recommendations section.

The fourth step of the guide is assessment (Bardach, 2012). Efficiency, equality, equity,

Figure 4



fairness, justice, freedom, process values and political acceptability are commonly used measures when assessing and evaluating policy proposals (Bardach 2012). After identifying possible alternative solutions, I will assess the effectiveness of these solutions. To do so I will utilize the Strengths Weaknesses Opportunities and Threats (SWOT) analysis process, shown in figure 4 to the right (Fitzgerald, 2017).

The sixth step of the eightfold path is to confront the tradeoffs (Bardach, 2012). Many times, solutions vary in how well they address the issues being analyzed. By completing this policy analysis, I will have fulfilled the eighth and final step of Bardach’s eightfold path by presenting my findings and making this information available to others (Bardach, 2012).

ASSEMBLE EVIDENCE

Safe injection facilities are legally sanctioned facilities where people consume pre-obtained drugs under the supervision of trained staff and are designed to reduce overdose and other health issues often associated with IDU. In these facilities, staff do not assist individuals in consuming drugs, but are available to provide sterile injection materials and information on safe injection behaviors, administer first aid if necessary and monitor for signs of overdose (Drug Policy Alliance, 2019). Fischer notes: “Despite local differences between facilities, the majority of SIFs operate on the basis of similar operational practices and rules. They are usually run by

social or health workers (nurses) who provide clean injection equipment but no drugs or injection aid; access is limited to local or registered users; restrictions are placed on duration and frequency of use; and drug sharing and violence on-site are prohibited” (Fischer, 2002). The image to the right shows the kind of materials that are provided to patrons of safe injection facilities and then properly disposed of after each visitor (Toronto CityNews, 2017). Twelve nations have legalized safe injection facilities: Australia, Canada, Denmark, France, Germany, Luxembourg, the Netherlands, Norway, Spain and Switzerland (Drug Policy Alliance, 2019).



Canada

The first safe injection facility in North America opened in Vancouver, British Columbia, Canada in September 2003 (Pinkerton, 2010). Since 1990, fatal overdoses, bloodborne diseases, and other health problems associated with IDU emerged as troubling phenomena in most Canadian cities (Fischer, 2002). These issues were not limited to Canada: the United States and Mexico also began to see increased rates of overdoses and infectious diseases like HIV and HCV (Marshall, 2011).

In 2003, as a response to rising rate of HIV, homelessness and public drug use, the Canadian Minister of Health allowed InSite, a safe injection facility and SSP, to operate although it violated section 56 of the Controlled Drugs and Substances Act (CDSA) (Chu, 2012). The CDSA forbids the sale, export, import, possession or production of controlled substances and precursors. Some of the substances specifically identified in the act include cocaine, fentanyl,

morphine, methamphetamine, ephedrine as well as analogues, derivatives, isomers and salts (Government of Canada, 2019a). Like the “crack house” statute included in the U.S. Anti-Drug Abuse Act, the CDSA includes language that allows for exemptions. The CDSA specifically states: “The regulations and exemptions authorize lawful activities for medical, scientific and industrial purposes” (Government of Canada, 2019a). Because of its interpretation of this language, the federal government of Canada was able to forgo prosecuting the operators of InSite.

In 2011, Canada’s Minister of Health attempted to revoke InSite’s waiver. The supreme court of Canada ruled that while the CDSA’s provisions were applicable to InSite, the Minister’s refusal to extend their exemption violated the Canadian constitution. The ruling held that two sections of the CDSA were unconstitutional because they violated the Canadian Charter of Rights and Freedoms. Because InSite was providing a medical service, the law denied healthcare to people with substance use disorders and therefore violated section 7 of the Canadian Charter of Rights and Freedoms (Chu, 2019). The federal government of Canada argued that the health risks that would be suffered by people with substance use disorder and PWID due to the closing of InSite would not be the fault of the federal government, but the fault of the individuals themselves who “choose” to use drugs. This argument was rejected by the supreme court on the grounds that it had been established that addiction was a disease and there were positive outcomes associated with InSite (Chu, 2019).

InSite serves more than 7,200 registered clients with 15,000 to 20,000 visits each month. Each of these individuals is a PWID and are therefore at heightened risk of contracting HIV or experiencing overdose (Drucker, 2006). One thing that must be considered when determining the value of a public health intervention is whether the benefit outweighs the cost. Costs can be

financial as well as material, as well as unintended consequences that impact both the target population and others. To determine costs and benefits, prevented cases of HIV and fatal overdose were tracked and prevented deaths and costs of lifetime treatment of HIV were compared to InSite's operating costs (Pinkerton, 2010) (Drucker, 2006).

In an article in the *International Journal of Drug Policy*, Martin Andresen and Neil Boyd published the first evaluation of InSite. The authors chose to keep their estimates conservative, so they employed values that yielded the lowest benefits generated by the site (2010). This methodology reduces the risk of overestimating the return on investment. In estimating operating costs, Andresen and Boyd focused on the annual operational costs of the safe injection facility portion of InSite. At \$1.5 million, this estimate does not include the cost of services such as addiction counseling and case management, providing primary health services, public health screening, housing services, education and peer counseling (Andresen, 2010). These operational costs were compared to the lifetime medical cost associated with new HIV infections. Those costs were estimated to be about \$150,000 per case. Next, they estimated the value of prevented death based on gross domestic product, average income in British Columbia, the value of lost productivity and lost wages (Andresen, 2010). The value lost to society was determined to be \$500,000 for a new HIV infection and \$660,000 for a fatal overdose (Andresen, 2010). Another study noted that while overdose incidents did take place at safe injection facilities, they were reported to occur at lower rates than in other spaces. It also noted that overdose incidents handled at the safe injection facilities lowered the need for hospital admissions compared to street overdoses (Fischer, 2002). In determining the cost-benefit of InSite, Drucker believed increased costs associated with the crime, public disorder, increased relapse among former drug users or drug dealing should be measured. It was found that InSite had not increased any of these costs,

nor had it hindered those seeking to cease drug use altogether (Drucker, 2006). So Thus, there are no costs associated with these outcomes.

Since the value of each individual life has been determined, the next step is to determine how many of those individuals have been saved by the services offered at InSite. From March 2004 to August 2005, there were 336 overdose events at InSite, about 1.3 overdoses per 1000 injections. InSite prevented 1.78 potential deaths from HIV per year and 1.08 fatal overdoses per year (Andresen, 2010). To determine if the investment in InSite resulted long-term savings, the

Table 1
Savings from average number of estimated annual deaths prevented at Insite.

	Estimated deaths prevented	Savings per death prevented	Total savings
HIV deaths	1.785	\$500,000	\$892,500
Overdose deaths	1.08	\$660,000	\$712,800
Total deaths	2.87		\$1,605,300

overdose deaths and HIV transmissions prevented need to be compared to the costs associated with them. The

Table 1 illustrates the savings from deaths prevented by InSite (Andresen, 2010). It was determined 2.87 total deaths per year were prevented which resulted in a total savings of over \$1.6 million (Andresen, 2010). Based on the study by Andresen and Boyd, a determination was made that InSite was cost effective and had a positive impact on the health outcomes of PWID in Vancouver’s Downtown Eastside. The benefits from Insite comes from 2 sources, the provision of clean injecting materials and the facilitation of changes in injecting behavior among people who used the facility (Andresen, 2010). These 2 sources of change are important to reducing rates of harms associated with IDU. Not only do people know there is a facility where they can safely inject drugs, they take the information they learn at the facility back to their social networks. Ultimately, the authors recommended the expansion of InSite: “Expansions of Insite should be considered in order to accommodate a greater proportion of the injections taking place

in Vancouver's Downtown Eastside—in order to further reduce the harm from injecting drug use" (Andresen, 2010).

Piloting in America

While safe injection facilities cannot operate legally in the United States, some states have conducted pilot studies and assessed the acceptability of such sites in various states and cities. The demographics and healthcare systems of the nations that have legalized and established safe injection facilities are very different from the United States, therefore research conducted in those countries are not easily generalizable. It is valuable to create projections of safe injection facility outcomes through either pilot programs or analysis conducted by those who know the United States market and the results of safe injection facilities in other nations.

A proposal drafted by the Massachusetts's Task Force on Opioid Therapy and Physician Communication examined the feasibility of establishing a safe injection facility in Massachusetts. A SWOT analysis found primarily positive outcomes relating to the implementation of a safe injection facility. They based their estimates on those of the only safe injection facility legally operating in North America, InSite in Vancouver, Canada. The report noted that evidence showed that safe injection facilities were associated with a reduction of harms associated with drug use and provided improvements to the local communities they serve (Fitzgerald, 2017). A common belief by those who oppose safe injection facilities is that they discourage individuals from entering recovery. However, the report from Massachusetts found: "SIF utilization is associated with an increase in referral to addiction treatment, including a 30% increase in the rate of detoxification use and an increase in the initiation of methadone maintenance therapy" (Fitzgerald, 2017). When people come in contact with systems that are designed to provide support and have information about recovery services, they are more likely

to utilize them. Conversely, those who inject drugs on the street may never meet an individual with the information they need to access treatment. The economic impact of these facilities was also discussed in the report. While these facilities cost money to operate and staff in the long run, they generate a savings to society. The reporter stated, “Researchers estimate that potential savings from averted HIV and HCV virus (HCV) infections, reduced skin and soft tissue infection, averted overdose deaths and increased medication-assisted treatment uptake for total annual net savings of \$3.5 million for a single 13-booth SIF” (Fitzgerald, 2017). The savings generated by safe injection facilities far outweigh the initial cost to open them and ongoing operational costs. However, that doesn’t mean efforts for legalization should be abandoned; there are lives at risk if they are.

ALTERNATIVE SOLUTIONS

Establishing safe injection facilities is not the only way to reduce rates of overdose and infectious diseases. Because SIFs have not been implemented or tested in the United States, their impact here is unclear. Since the 1970s the United States has been engaged in the “War on Drugs.” In recent years, under the leadership of the Surgeon General Jerome Adams, MD, there have been calls to increase access to Naloxone for everyone, not just first responders and medical personnel (HHS, 2018). Syringe exchange programs have begun to proliferate across the United States: although they too were opposed and called “enabling” they have become part of the fight against the opioid epidemic and IDU.

The War on Drugs – the status quo

In the 1970s, the United States began to approach the drug problem by increasingly criminalizing the possession, sale and use of some addictive substances. As a result, the prison population in the United States has grown from 300,000 people in 1972 to nearly 1.5 million at

the end of 2017 (Bronson, 2019). That number peaked at 2.3 million incarcerated people in 2011 (Stevenson, 2011). In a paper published by the Global Commission on Drug Policies, Bryan Stevenson states “Drug Policy and the incarceration of low-level drug offenders is the primary cause of mass incarceration in the United States” (Stevenson, 2011). Many drug-related incarcerations are for non-violent crime; 40% are due to simple possession of marijuana (Stevenson, 2011). As of June 5, 2019, recreational marijuana was legal in 11 states and “medicinal” marijuana was legal in 33 states (Berke, 2019). This shows that attitudes toward marijuana use are changing and means that many of the people who are in prison today would not be incarcerated based on today’s laws. Increased use has strained the criminal justice system and has infringed on law enforcement’s ability to investigate other kinds of crime. (Stevenson, 2011). Increasingly, prisons are becoming full of people whose underlying issue is a substance use disorder, while for many, drug treatment and counseling would be a more effective means of reducing addiction, abuse, and rates of recidivism (Stevenson, 2011). The World Health Organization also discourages the use of mass incarceration as a means of reducing rates of drug use noting: “Criminalisation of drug use and stigma and discrimination against people who inject drugs contribute to ongoing HIV epidemics as people who inject drugs fail to access harm reduction and other health services (WHO, 2019). The United States has the highest rates of incarceration in the world, and some of the worst rates of overdose, overdose death and infectious diseases due to many “restrictive and ineffective policies” (Stevenson, 2011). Criminalization is an ineffective option and not a good alternative to safe injection facilities. These policies have been in place for decades and have resulted in ballooning incarceration. They have not achieved the goals of reducing rates of fatal and non-fatal overdose and infectious diseases.

Syringe Service Programs

Syringe service programs (SSP) are implemented to reduce the reuse and sharing of syringes and other injection equipment. It has been more than 30 years since the first SSPs were implemented in the United States (Des Jarlais, 2009). The goal of syringe exchange programs is to provide clean syringes in exchange for used ones from PWID. HIV is transmitted through multi-person use of drug injection equipment rather than through drug use itself. It is thus possible to prevent HIV exposure and transmission among people who continue to inject drugs by giving them access to clean syringes. While the concept of harm reduction predates the discovery of AIDS, these services were implemented in the United States 30 years ago when AIDS began to spread among PWID (Des Jarlais, 2009). When HIV/AIDS was first discovered it caused serious concern among medical specialists because they were unsure what this new disease was, how it was spread or how to treat it. In the past 35 years, there have been significant developments in the understanding, treatment and prevention of HIV (CDC, 2019 f). Harm reduction interventions were necessary early in the AIDS epidemic, as lives were being lost quickly. While the number of people dying from complications related to HIV/AIDS has decreased, HIV is still common among PWID and still takes lives (CDC, 2019 f). While the main goal of SSPs is to reduce public drug use, sharing of injection materials, and improper disposal of used needles, these programs are also able to provide other products and services to address other high-risk behaviors and potential associated harms. A 2007 review of SSPs found that a majority of them offered:

- Condoms and education on use
- Alcohol pads
- HIV counseling and testing
- Referrals to treatment
- Education on HIV, hepatitis A, hepatitis B and HCV

- Education on vein care and abscess prevention
- More than half provided HCV counseling and testing
- Slightly fewer than half of the programs provided hepatitis A and hepatitis B vaccination
- STD screenings
- 40% provided Naloxone
- 33% provided on-site medical care
- 7% provided buprenorphine
- A majority of programs provided food, clothing and personal hygiene products (Des Jarlais, 2009).

In an article that examined seven studies on participation in SSPs, six of the seven found that SSPs were associated with a significantly lower risk of HCV seroconversion or detection in the blood (Hagan, 2011). SSPs are another evidence-based public health intervention that can help reduce the spread of infectious disease and reduce rates of overdose. They also serve as an opportunity to refer patients to treatment for substance use disorders and confirm HIV or HCV infection status (Des Jarlais, 2009). As SSPs are already operating in many cities across the nation, evidence can be collected to show their value. However, SSPs do not have the goal of reducing rates of fatal and non-fatal overdose. While they have a comparable effect on reducing rates of HIV and HCV, their impact on overdose is less significant. Only about 40% of SSPs provided naloxone to their participants. Providing Naloxone to PWID was not commonly done prior to the implementation of SSPs. Outcomes from doing so have assisted in reducing rates of overdose, but has not had as much of an impact as safe injection facilities do (Des Jarlais, 2009).

Increased Access to Naloxone

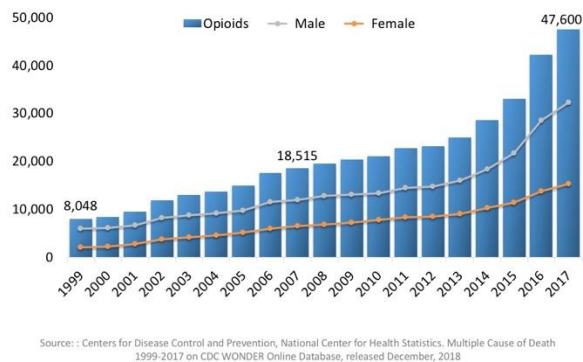
Overdose and overdose death rates have increased as rates of opioid use have risen (CDC, 2018 d). In the past 30 years, fatal poisonings caused by drug overdose have increased by nearly 600%; they are now the leading cause of injury-related death, surpassing auto accidents (Davis, 2015). One tool that reduces rates of overdose death and the harms of prolonged respiratory suppression, naloxone, was first approved by the Food and Drug Administration in 1971. Access to the medication typically requires a prescription, but it is not a controlled substance. It functions by rapidly displacing opioids from the brain receptors to which they bind, reversing the opioids' effects and restoring normal respiration. Reducing the amount of time the brain is without oxygen reduces risk of permanent brain injury and death (Davis, 2015). In 2018, the United States Surgeon General called for expanded access to naloxone, not only for people who use drugs but for their families, acquaintances and anyone who may interact with a person at risk of overdose (HHS, 2018). Many states and jurisdictions have taken the steps necessary to improve access to this lifesaving medication and are finding positive results. One study in Massachusetts found that communities with higher access to naloxone and overdose training had significantly lower opioid overdose death rates than those that did not (Davis, 2015). Some worry that providing naloxone to people who use drugs will encourage them to use drugs or use more drugs knowing they can be revived. However, the same study in Massachusetts found "training active substance users in overdose management and distributing naloxone rescue kits does not lead opioid users to increase their overall opioid use (Davis, 2015).

While the main concern of public health interventions is saving lives, the costs associated with an intervention and its resources are important considerations. One study noted that the cost of emergency department treatment for people who had overdosed in Rhode Island in 2008 could

have paid for 61,000 naloxone kits at the then-current cost of \$15 each (Davis, 2015). Not only does providing naloxone save lives, it reduces to costs associated with expensive medical care like the use of IVs, scans and tests and utilization of beds often provided by emergency departments.

One issue that can impede the provision of medical care for people who overdose is the fear felt by those with whom they were using drugs. They may fear prosecution for the potential death of their friend/acquaintance, drug possession charges, or other issues with law enforcement like parole violations or warrants. In order to reduce these issues and encourage people to call 9-1-1 when someone is experiencing an overdose, many states have passed Good Samaritan laws. New Mexico was the first to enact such a law under which anybody “who, in good faith, seeks medical assistance for someone experiencing a drug-related overdose shall not be charged or prosecuted for possession of a controlled substance” (Rees, 2017). Good Samaritan laws provide some immunity to people who interact with police after calling emergency services and are found to be in possession of a controlled substance. The laws vary as to what crimes are eligible for immunity, addressing issues such as whether police have a warrant or whether the companion is on probation (Rees, 2017). This inconsistency causes some of the confusion among PWID as to whether they will be punished should they call emergency services or law enforcement to assist a person experiencing an overdose. Since the New Mexico law was passed in 2007, 33 more states and Washington, D.C. have passed their own form of a Good Samaritan law, and some provide more protection than others (Rees, 2017).

Figure 5 National Drug Overdose Deaths Involving Any Opioid, Number Among All Ages, by Gender, 1999-2017



Despite increased access to naloxone, opioid overdose rates continue to rise. Figure 5 to the left, from the National Institute on Drug Abuse, shows there has been a steady increase in opioid overdose deaths between 1999 and 2017 (NIDA, 2019). While increased access to

naloxone is an important step in reducing rates of overdose, its limitations, including the frequent need for a prescription, impair its ability to address the crisis rapidly enough. In addition, the availability of naloxone does not affect syringe sharing behavior and thus does not reduce rates of infectious diseases as do safe injection facilities. Naloxone is an important tool for combatting the opioid crisis but is not a sufficient alternative to safe injection facilities.

RESULTS

Outcomes of safe injection facilities have been positive in Vancouver, British Columbia. However, Vancouver has characteristics that are very different from those of the entire United States. The health care system in Canada functions quite differently than that of the United States; the United States contains rural communities; and there are disparities in insurance coverage in the United States that do not exist in Canada. There are, however, similarities that indicate similarly positive outcomes could occur. The opioid crisis hit both Canada and the United States and caused harms, such as overdose, HIV and HCV to occur at similar rates (reference). Because of the differences, it is difficult to estimate the operating budget and outcomes that could occur should safe injection facilities open in the United States. The similar rates of overdose, HIV and HCV that have occurred across North America indicate that we could

expect rates to be impacted by the legalization of safe injection facilities on par with the way they were impacted in Canada, and we can make estimates on results in the United States.

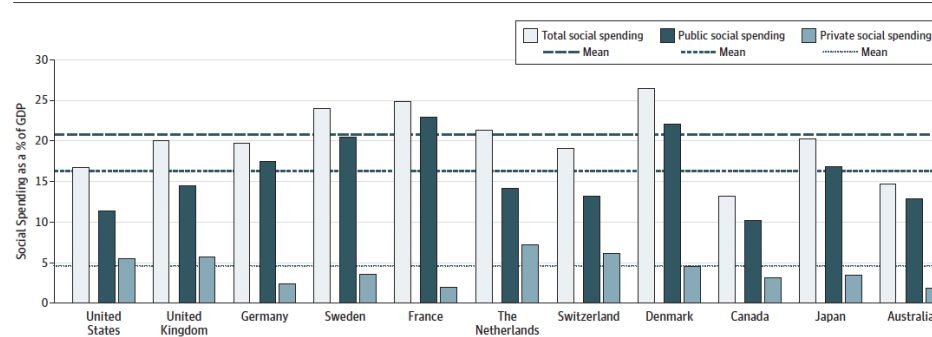
Vancouver is an urban, metropolitan city with a population of 2,463,431, a majority of which is between the ages of 15 and 64 (Statistics Canada, 2016). It is also one of the most racially diverse cities in Canada. Comparing the outcomes in a metropolitan area to an entire nation is difficult. The United States contains a mixture of rural and urban areas. Rural areas cover approximately 97% of the nation's land area but contain 19.3% of the population – approximately 60 million people (United States Census Bureau, 2016). Rural communities have fewer resources than are available in urban areas. Research has shown rural areas have a lack of services, especially primary care providers. Rural residents not only have different health needs, they have different health-seeking behaviors (Douthit, 2015). Being insured or underinsured is another issue facing Americans that Canadian citizens do not experience. Even within the United States, there are disparities in insurance coverage. One study found rural residents had less comprehensive insurance coverage, which makes them less likely to seek and receive medical care, since they will have higher out-of-pocket costs (Douthit, 2015). Canadians do not experience these financial constraints. If safe injection facilities were legalized in the United States, we could expect access to be lower in rural communities, since people living in those communities already experience issues in accessing medical care and other services (Douthit, 2015). Thus, we would expect the utilization of safe injection facilities to be lower than that of Vancouver in rural areas, but similar in urban areas, which would impact outcomes. There may be an opportunity to compare outcomes from regions of Canada that are more similar to the United States. Thirty-nine new safe consumption sites have been approved by the Canadian government and have begun to offer services; most opened and started operating in late 2018 or

throughout 2019, so data is not yet available, but there is no doubt the same type of surveillance that took place with Insite will take place with these new facilities (Government of Canada, 2019 b). Hopefully, those results will be more generalizable to the United States.

One major difference between the United States and Canada is their healthcare systems. The United States' system is a combination of private and government subsidized insurance. Canada's healthcare system is described as a "regionally administered universal public health insurance program," whereas the United States system consists of "private employer-based and individual insurance" as well as government-run programs (Papanicolas, 2018). These two systems are dissimilar and yield differences in healthcare expenditures and portions of the population that have insurance. The consensus among health economists has been that the United States fee-for-service system is a primary factor of the high rate of spending and poor health outcomes. This system results in high utilization of healthcare services but poor outcomes (Papanicolas, 2018). Of all the developed nations, the United States spends the most per capita on healthcare, and healthcare makes up the largest portion of its GDP, but has the worst health outcomes and highest rates of poverty. The lack of focus on population health, in the form of less social spending, is a possible reason healthcare spending is so much higher in the United States, but health outcomes are not better. Social spending is defined as "the provision by public (and private) institutions of benefits to and financial contributions targeted at households and individuals to provide support during circumstances that adversely affect their welfare. The

amount of social spending as a percentage of GDP is shown in figure 6 (Papanicolas, 2018).

Figure 6 Social Spending as a Percentage of Gross Domestic Product



Other potential explanations for why healthcare spending is so high in the U.S. include its lack of

investment in social programs, poor ratios of primary care physicians to specialists and reliance on a fee-for-service model that encourages healthcare utilization that may not be necessary (Papanicolas, 2018). An investment in safe injection facilities reduced healthcare spending in Canada, and similar results would likely be seen in the United States. In fact, SIF implementation in the U.S. lead to even greater savings. Because of the uninsured rate and lack of access to primary care providers, many Americans, especially in rural areas, seek medical care from emergency departments (EDs), which provide some of the most expensive care in the healthcare system. In fact, areas that do not have community health centers have a 33% greater rate of all ED visits (Douthit, 2015). Safe injection facilities preventing the spread of disease and infections would mean fewer ED visits, which would have a more significant impact in rural communities.

Despite all these differences, I will still attempt to determine the potential impact safe injection facilities could have in the United States. One way to do that is to estimate the number of people who might utilize safe injection facilities. Although people in rural communities would have a more difficult time accessing these services, 81% of the population resides in urban areas, and the outcomes documented in Vancouver are more applicable to them (United States Census Bureau, 2016). This estimate is meant to be just a start in determining outcomes. In a cost-effectiveness analysis, it was assumed that 21% of PWID in Vancouver would use InSite

regularly. If we applied those estimates to the United States population of PWID, which is between 4,583,188 and 8,641,788, we would anticipate between 962,469 and 1,814,775 people to use safe injection facilities regularly in the United States (Lansky, 2014).

Fatal overdose death rates have continued to rise in the United States as fentanyl has increasingly been found in heroin and other illicit substances (Davis, C., 2015). Canada saw similarly high rates of fatal overdose in the 1990s, and in 2003, began implementing safe injection facilities to address them. The positive impact was seen quickly: between March 2004 and February 2008 there were 1004 non-fatal overdoses at Insite and 0 fatal overdoses. It has been reported that had the non-fatal overdoses occurred outside Insite, 50 people would have died or 4.98% of the observed overdoses (Larson, 2017). A study of pre- and post-overdose mortality rate near Insite showed a 35% reduction in mortality within 500 meters of the facility within 3 years of opening. If we anticipate between 962,469 and 1,814,775 PWID accessed safe injection facilities in the United States and saw a 35% decrease in fatal overdose between 336,864 and 635,064 lives could be saved by the implementation of safe injection facilities due to the immediate provision of naloxone to all people who overdose in the facility. While people who are revived outside a medical facility are encouraged to go the ED after experiencing an overdose, many do not out of fear of prosecution, lack of access or other limitations. If each of the 336,864-635,064 non-fatal overdoses were treated at a safe injection facility, \$31,642,002-\$1,217,417,688 could be saved in ED charges, based on an average 2016 cost of \$1917 per visit (Knowles, 2018). Had those overdoses occurred outside a safe injection facility, an estimated 16,506-31,118 of them would result in death (reference?). Implementation of safe injection facilities in the United States could turn the tide on overdose deaths, save lives, and provide people with an opportunity to enter recovery. This information is illustrated in Table 1.

InSite not only was associated with reducing hospital visits, but also reduced rates of HIV and HCV and thus reduced the healthcare costs of diagnosing and treating these diseases. Reducing sharing of injection materials is paramount to reducing the proliferation of HIV. One study found that after visiting InSite, 75% of their visitors reported adopting safer injection practices outside of the facility (Semaan, 2011). If 75% of the anticipated visitors to safe injection facilities in the United States adopted safer injection practices, the risks associated with IDU would be reduced for 721,851-1,361,081 people per year. The goal of safe injection facilities is to provide people a place to access clean materials so they no longer share injection materials. However, it's unrealistic to expect PWID to consume drugs only at the facility. Potential changes in injection behavior outside InSite indicate a positive shift toward preventing bloodborne illnesses and overdoses. Evidence from InSite demonstrates that it prevents more than 80 HIV infections annually (Larson, 2017). Among its 7200 clients, .01% of patients' HIV infections are prevented. In the United States, we could anticipate 9,624-18,148 HIV infections prevented among PWID who would utilize the services at safe injection facilities in the United States. This reduction would not only save people the anguish of an HIV diagnosis and save lives, but would also reduce health care spending related to treating the disease. According to the CDC, the average cost of HIV treatment in the United States was \$379,668 per person (CDC, 2017). With the implementation of safe injection facilities there could be healthcare savings between \$3,653,924,832 and \$6,890,214,864. This information is illustrated in Table 2.

TABLE 2		
	Cases Prevented	Healthcare Savings
Total Overdose	336,864 – 635,064	\$31,642,002 - \$1,217,417,688
HIV	9,624 - 18,148	\$3,653,924,832 - \$6,890,214,864

DISCUSSION AND RECOMMENDATIONS

The Massachusetts task force made several recommendations for a safe injection facility that are generalizable to the entire United States.

First, they found that it was reasonable to advocate for pilot safe injection facilities to be opened. These pilot facilities would provide an opportunity for research to be conducted in the United States to see if the results in Canada, Australia and the 10 other nations with legally operating safe injection facilities will hold true here (Fitzgerald, 2017). This would help determine how these facilities would operate in a population with different demographics than Vancouver and in rural communities that already experience more difficulty accessing medical care and public health services. These pilot programs would need to be established in various places in order to avoid variations in access. An option could be to establish them in already operating SSPs. These programs already have some of the resources necessary to operate, such as clean syringes and other injecting materials, naloxone, staff trained to provide information on naloxone use, administer it and provide education to participants on safe injection behaviors.

One thing that must be kept in mind when analyzing the results of pilot safe injection sites is that the investment in a public health program will be reflected in reductions in healthcare spending or in other industries. This phenomenon is known as the “wrong pocket problem” (McCullough, 2019). This issue can result in further investments being made in an industry that didn’t contribute to reductions in spending, but where those reductions are being made. This can especially be an issue if investments and incentives are being provided to private or for-profit entities at the expense of the government organization that actually caused the positive outcome. Using safe injection facilities as an example, an investment by the state and federal government in public health departments or currently operating SSPs would enable these facilities to open

and operate. When their results are evaluated, likely after 1 year, the cost benefits of these facilities will be reflected in reductions in healthcare spending, on emergency room visits, HIV and hepatitis C treatment and treatment for soft tissue infection. This may lead some to believe that healthcare services are the source of those benefits, in reality it's safe injection facilities that led to those benefits. The "wrong pocket problem" is important in this context because the entity that brings about the positive outcome should benefit from the financial gains they create. Unfortunately, this is not typically the case, in fact public health spending has decreased steadily since 2000 though it's been estimated that a \$1 investment in public health yields a \$67-\$88 benefit to society (McCullough, 2019). As the benefits of safe injection facilities begin to reveal themselves in pilot programs, additional facilities will likely need to be opened, this will increase the spending of states and the federal government. Since safe injection facilities themselves don't generate their own revenue, and the savings are benefiting hospitals and insurance providers, there won't necessarily be more money available to invest. This can create an issue in and of itself but there are a couple of potential solutions to this issue. One solution is to utilize value-based payment approaches for healthcare. This approach may help increase the financial incentives for healthcare providers to invest further in public health interventions that improve health (McCullough, 2019). The current fee-for-service model encourages the use of multiple tests to increase financial benefit for providers and encourages patients to overutilize health services, though it doesn't result in improved health. Another way to reduce this problem is to eliminate the siloes of government funding. Increasingly, it's being shown that public health is worth investing in, but the "wrong pocket problem" threatens to lessen the evidence of that (McCullough, 2019).

In order to advocate for opening safe injection facilities in the United States, state-led task forces will need to advocate for exemptions from the so-called “crack house” statute that was enacted as part of the 1986 Anti-Drug Abuse Act (Kreit, 2019). Without protection from prosecution, it would be unethical for advocates to ask doctors, nurses, physician assistants, counselors etc. to assist in the operation of a safe injection facility (Fitzgerald, 2017). Violating the law and providing what the government does not see as medical care to patients in a safe injection facility could put providers at risk of losing their licenses or worse. It seems unlikely that the current administration would choose not to enforce the federal policy, and they are likely to prosecute those who open and operate safe injection facilities in the United States. This assessment is based on the comments made by Deputy Attorney General Rod Rosenstein mentioned earlier (Kreit, 2019). New paragraph Another strategy is to target members of Congress whose states and districts have been significantly impacted by the current opioid crisis, and drug crises of the past, and encourage them to sponsor legislation that would exempt state-sponsored facilities. Effective advocacy would need to include doctors, nurses, people in recovery, counselors, families of overdose victims, law enforcement, public health leaders, pharmacists and harm reduction experts. A strategy of utilizing the judicial system to establish precedent for safe injection facilities could also be used, following the example of Canada. When the Minister of Health attempted to block the renewal of InSite’s waiver, advocates used the courts to challenge to decision. The supreme court of Canada ultimately made the decision that allowed legal SIP operation (Chu, 2019). The courts have been used in the past to change *de facto* and *de jure* laws in the United States relating to discrimination and could be used to implement safe injection facilities (need a reference here).

Finally, safe injection facilities should be considered just one part of combatting the opioid crisis. When it comes to delivering medical care, we've seen time and time again that addressing multiple issues at once with multiple evidence-based interventions is the best way to improve outcomes and manage health and wellness. Likewise, we should advocate for multiple harm-reduction strategies to be available at safe injection facilities. This includes, but is not limited to, counseling, referrals for treatment and other social services, SSPs and on demand treatment for all types of substance use disorders (Fitzgerald, 2017). Support for these other services have slowly increased over the past decade. This approach may also be a more effective way to frame safe injection facilities to increase support from the community, law enforcement and policy makers.

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