PAVING THE POLICY PARKWAY FOR THE NATION’S FIRST SUPERVISED INJECTION FACILITY
Abstract

Supervised injection is a contemporary harm reduction measure that aims to reduce the adverse effects of injection drug use. Such facilities have successfully reduced overdoses and public injection in Europe, Australia, and Canada. There currently exist no supervised injection facilities (SIFs) in the USA, although they are now part of the conversation on overdose reduction in this country.

This project is a mixed-methods survey assessing the potential to establish a SIF in Denver, Colorado. Denver possesses several attributes making it a candidate for supervised injection, including a robust harm reduction organization, liberal social policies, and a prominent public drug use scene. Unfortunately, drug overdose is also on the rise in Denver. Supervised injection could help alleviate the latter two problems in a cost-effective manner. This project aims to inform the research question, “Can Denver establish a supervised injection facility?”

The research involves a semi-structured interview with quantitative variables including Likert scale ratings and discrete frequencies. Subjects include a broad sample of people who inject drugs (PWID) as well as community stakeholders from the business, health care, and municipal realms. Analyses include statistical comparisons, qualitative analysis of interview data, mapping, geospatial mapping, cost-effectiveness analysis, and cost-benefit analysis. Following are recommendations on the next steps in the push for a SIF in Denver.
I. Introduction

Injection drug use is an uncommon but uniquely destructive health behavior. It is closely associated with addiction and dependency. Its effects pervade the lives of users, causing significant problems in virtually every realm of functioning. Furthermore, the effects of injection drug use spill over to family members, the health care system, and even bystanders who do not engage in injecting. The injection-related burden of crime, disease, and public disorder is thus shared by users and nonusers.

Prohibitions on drug use have largely failed to stem drug use in all its forms. Even countries with very strict drug laws have rates of injection drug use approaching 1 in every 200 adults; sometimes, rates are actually lower in countries with more liberal drug laws (Mathers 2008). Often, strict drug laws have a counterintuitive effect on drug use. Instead of ceasing drug use to come into compliance with the law, users instead engage in more risky behaviors (Burris 2004).

Some schools of thought address drug use as a dangerous health behavior rather than criminal activity. One of these approaches to drug policy is called harm reduction. Harm reduction is “a set of practical strategies and ideas aimed at reducing negative consequences associated with drug use.” Others have defined harm reduction as “meeting users where they’re at” and other definitions emphasize that harm reduction accepts continued use of drugs. This approach acknowledges that drug use is a reality and tries to decrease the attendant harms to individual and community life and well-being instead of encouraging abstinence (Harm Reduction Coalition 2015).

Two current topics in injection-related harm reduction are syringe access and overdose prevention. Syringe access, also known as needle exchange, not only provides sterile needles to injection users but also helps them dispose of needles safely. Government-funded studies in the US have found syringe access can reduce needle sharing and the spread of bloodborne disease, primarily HIV and hepatitis C (SAMSHA 2015). Overdose prevention includes education and provision of naloxone, an opioid antagonist agent which can immediately reverse opiate overdose. These practices have become commonplace in many US cities over the past twenty years; they now form a cornerstone of the public health approach to injection drug use.

While HIV and hepatitis spread have been addressed by needle exchange, opioid overdose is an emerging public health crisis. For many years, overdose was a minor cause of death in the US and occurred mainly in young males. From 2001 to 2014, the number of overdose deaths from opioid painkillers nearly tripled. Over the same period, the number of heroin overdose deaths increased sixfold (NIDA, 2015). Overdose is the leading cause of injury death for people ages 25 to 64; injury is the leading cause of death from 25 to 44 and the third-leading cause of death for people 35 to 64. In terms of lost years of life, overdose thus comprises a huge mortality burden in the US, accounting for 27% of the costs of all fatal injury (CDC, 2016).

In many places, including Colorado, substance abuse and overdose are the leading cause of death for homeless adults (Baggett 2013 and Colorado Coalition 2014). While fatal overdoses on prescription opioids still outnumber heroin overdoses, heroin overdoses are undoubtedly an epidemic in their own right. The Colorado Department of Public Health and Environment cites a 700% increase in heroin
overdose deaths over the 12 years from 2003 to 2015 as evidence for this epidemic; virtually all these overdoses occurred due to injection (Wild, 2016).

One method for preventing overdose is called supervised injection. Known in Europe as drug consumption facilities, supervised injection facilities, or SIFs, have developed over the last thirty years to jointly address syringe access and overdose prevention. They began in the Netherlands and Switzerland as organic responses to open drug scenes and risky injection practices. They have since spread to many major cities in Europe, Australia, and Canada.

The first SIFs emerged in the 1970s and 1980s in Europe. Many were founded to provide general social services to indigent persons. The prevalence of injecting drugs among the marginalized patrons of these facilities led many of the sites to become de facto “shooting galleries,” where people used drugs in bathrooms with impunity. Rather than attempt to stamp out the practice, one facility in Bern—a café for homeless people—instead privately sanctioned it. Thus, the first official supervised injection facilities simply involved outside stakeholders, such as city officials and other nonprofit providers, to support what was already happening on the premises.

These facilities did not simply happen haphazardly. They grew from private efforts that were ignored or tolerated by city government to well-funded organizations with the full support of health and law enforcement officials. In 1996, supervised injection was accepted on a federal level in the Netherlands. Municipalities that wish to start a supervised injection center must convene a “triangle committee” composed of police, prosecutors, and the mayor. Many Dutch supervised injection centers are run by regional governments (Dolan, 2000).

In Germany, on the other hand, supervised injection centers are usually run by non-governmental organizations (NGOs). There is not a formal approval process in Germany, but a wide range of stakeholders including neighbors, law enforcement, business owners, and the local government are usually consulted prior to SIF establishment. These SIFs often refer internally to affiliated treatment centers and other social services. German SIFs operated under tacit approval until 2000, when federal legislators established an exemption to drug laws allowing SIFs to operate (Kothner, 2011).

In Australia, SIFs had actually been approved for several years prior to the establishment of facilities. Illegal shooting galleries had long operated in sex shops in large cities throughout the country. When officials learned of this, they decided to go forward with supervised injection. However, the regulations for supervised injection were onerous, and in 1998, a local church opened an unsanctioned SIF. It was closed and the reverend arrested. In 1999, regulations were relaxed, but there were problems finding an organization to operate the SIF; first, the Vatican ordered a Catholic church to withdraw its support, and later a university was ordered to disassociate from the effort under the threat of withdrawal of funding. Finally, another church stepped up to operate the SIF for the 18-month trial period and it has continued to operate the Sydney location ever since (Dolan, 2000).

Several years later, the Canadian Health Ministry approved a SIF in Vancouver to mitigate the unprecedented public injection scene in the city’s downtown lower east side. In 2003, Health Canada and the BC Ministry of Health agreed to fund the regional health authority, Vancouver Coastal Health (VCH) Authority, for a SIF on a trial basis. The Portland Hotel Society co-operates Insite with VCH. The funding—and the temporary approval for Insite to operate—has been quite tenuous in the nearly 15 years since Insite was established. Changes in the ruling party and ministerial posts have several times threatened the SIF’s existence. (Vancouver Coastal Health, 2015)
The map above shows the distribution of SIFs as of July 2016. There is still no supervised injection facility in the USA. While infectious consequences of drug use have stabilized in many places, overdose rates for all drugs, and opiates in particular, have increased dramatically since 2000 (NIDA 2015). Supervised injection facilities have the potential to decrease overdoses. The Drug Policy Alliance, a major proponent of decriminalization and harm reduction efforts, has targeted San Francisco and New York City for pilot SIF programs (DPA 2015).

This project addresses the prospect of a SIF in Denver. While Denver is not currently targeted by national harm reduction agencies for a SIF, the liberal social policies of the current municipal government and progressive social climate of the state make Denver a promising venue for furthering harm reduction efforts in our country. The establishment of a SIF in Denver would pave the way for other states to follow.

A. Literature Review

Currently, many barriers exist for supervised injection facilities in the USA. However, for each barrier, there is an opportunity. These span several disciplines: medical, legal, financial, and public health and safety. This literature review will proceed by subject area, noting opportunities as well as overlap. It will conclude with a summary of a recent meta-analysis of the literature on SIFs, the most comprehensive study to date about the medical, social, and legal consequences of supervised injection.

Opportunity One: Medical

The literature regarding medical benefits of SIFs is limited. These limitations stem from the ethical and logistical difficulties in studying marginalized illicit drug users, the limited geographic scope of countries in which SIFs operate, funding challenges, and the illegality of injection drug use in nearly every country. SIF’s potential medical effects extend to four major realms: 1) Acute benefits, chiefly reduction in
overdose risk; 2) diminishing the risk of chronic bloodborne illness, primarily hepatitis C and HIV; 3) preventing injection-associated illnesses, such as endocarditis and abscess; and 4) linking users with resources to decrease or abstain from drug use.

Two studies indicate that SIFs decrease fatality rates for overdose among injection drug users who utilize them. Vancouver’s well-studied SIF, Insite, published a landmark study suggesting that fatal overdoses declined by 35% in the immediate neighborhood of a new SIF, compared with small but insignificant declines in other areas of the city (Howell 2013). An extremely thorough study of the Medically Supervised Injecting Center (MSIC) in Sydney, Australia showed no definitive evidence of reduction in overdoses in the area of the facility (MSIC 2003). A large meta-analysis and policy paper by the European Monitoring Centre for Drug and Drug Addiction suggested anecdotally that overdoses decreased; however, this study found only an absence of overdoses inside SIFs rather than a decline in overall overdoses (Hedrich 2003).

SIFs have the potential to reduce overdose deaths through several mechanisms. Most dramatically, they are able to directly reverse overdoses through administration of naloxone via injection or nasal insufflation. Naloxone administration is highly effective even via informally trained peers, with 83 to 96 percent of overdoses successfully reversed, most often by a single injection of naloxone (Bennett 2011 and Piper 2008). On the premises of a SIF, overdoses are extremely rare and fatal overdoses nearly unheard of. One 18-month study of over 300,000 injections resulted in no fatalities. In addition, although SIFs do not routinely test for purity of injectables, client privacy allows for more careful injections.

Unfortunately, very little data support the hypothesis that SIFs improve medium-term and long-term health outcomes, particularly related to bloodborne and skin infections. Some studies state that these outcomes are not amenable to study through standard methods, and it has been suggested that hepatitis C is so prevalent among current users that significant reductions in prevalence are implausible.

There is ample literature suggesting that SIFs might improve injection-related behaviors and access to medical treatment. Homelessness and unstable housing are associated with a host of unsafe injecting behaviors, from reusing needles and other paraphernalia to improper disposal. These users are, in turn, more likely to experience both infectious and non-infectious consequences including overdose, hepatitis C, and HIV (SIF NYC, 2015).

One large quantitative study showed a decrease in needle sharing (Fast 2008). There are also anecdotal reports of such decreases (Wood 2007) after SIF implementation. Perhaps more importantly, people who injected at Insite reported improvements in a variety of health behaviors, including safe sex (Milloy 2010), sterile injection, and accessing health care. Many users report that they feel far more comfortable with SIF health care staff than traditional institutional health care providers.

Another advantage of supervised injection facilities is that many such facilities are linked to a continuum of care for substance abuse (Dolan 2000). The only large study on SIFs’ effect on treatment-seeking demonstrated a significant 30% increase in patients accessing treatment after the establishment of a SIF; contact with a substance abuse counselor further boosted treatment enrollment by 50% over baseline (DeBeck 2011). In one year at Insite, 488 users entered the onsite detox/treatment facility, appropriately called Onsite (VCH 2015). However, large-scale studies have not demonstrated a direct link between use of a SIF and long-term cessation of drug use.
In conclusion, there is insufficient evidence of large-scale medical benefit to recommend for or against establishment of a SIF on medical grounds alone. While supervised injection is highly unlikely to have medical drawbacks, there is simply an absence of large-scale, rigorous trials of supervised injection to suggest a causative relationship between the establishment of a SIF and improvement in health outcomes for PWID.

**Opportunity Two: Legal**

Legal issues are undoubtedly the primary barriers to establishment of a SIF in the USA. By any interpretation, a SIF would violate federal law. However, municipal and state laws have circumvented federal law in some instances, most notably by legalizing marijuana. Abroad, many SIFs operate under local approval and technically violate national laws. Therefore, the illicit nature of the enterprise does not entirely rule out the possibility of an American SIF.

SIFs necessarily violate at least two sections of the Controlled Substances Act (CSA), the preeminent law banning drug use. Section 844 prohibits drug possession, which means that virtually every client entering a SIF violates federal law. Section 856, the “Crack House Statute”, makes it illegal to “knowingly open or maintain or manage or control any place for the purpose of unlawfully using a controlled substance” (Controlled Substances Act 2010).

It is likely that courts would agree that supervised injection facilities qualify as the equivalent of “crack houses” since drug consumption is the very purpose of a SIF. By including staffing and injection-related equipment, SIFs go beyond mere provision of a safe place to use drugs (Rayfield 2009). However, some appeals courts have used the test that a place must contribute to manufacturing or distribution of drugs in order to qualify under this statute. Overall, the legality of a SIF is uncertain. There is very little legal theory on SIFs due to the absence of efforts to create one in the US.

Some legal commentators speculate that state authorities “have clear legal authority to authorize SIFs, just as they can legalize the cultivation, distribution, and possession of marijuana for medical purposes” (Beletsky 2008). However, just as federal authorities frequently crack down on marijuana use that violates federal drug laws, they would be even more likely to investigate flagrant violations involving hard drugs. It is also likely that different judges would interpret this statute in different ways, so in order to ensure sustainability of SIFs and the trust of potential clients, ensuring durable exemptions to federal controlled substance law would be imperative.

**Opportunity Three: Financial**

The absolute costs for most supervised injection facilities are low, especially when compared to other public health efforts. For instance, Insite—a very large supervised injection facility serving 6,500 clients—costs only $2.2 million per year (VCH 2015). Meanwhile, the lifetime discounted cost for treating HIV is $200,000 to $300,000 per infection (all currency values in 2015 American dollars); for hepatitis C, the corresponding cost is now $56,000 due to recent advances in drug therapy (Chhatwal 2015). While the cost for HIV treatment has not changed significantly in recent years, the expected costs for hepatitis treatment have risen steeply.

Given the well-defined costs of treating HIV and hepatitis C, calculating the cost effectiveness of a SIF should be relatively straightforward. However, assessment of the cost-effectiveness of such facilities is
actually very difficult to measure, and there are only a handful of studies that even attempt to measure the cost-effectiveness of a SIF.

Current studies on cost-effectiveness focus on mathematical modeling, making assumptions about needle-sharing rates and basing most analyses on HIV and HCV prevention alone. There are four such studies, three of which stem from Vancouver’s Insite. These analyses have been used to prospectively evaluate potential sites for SIFs in Ottawa and Toronto. Their findings have shown modest benefits through HIV and HCV prevention measured together, but not separately (Andresen and Boyd 2010, Bayoumi and Strike 2012).

Cost-effectiveness studies of SIFs, while limited to the two aforementioned countries, have generally shown significant cost reductions due to a presumed decrease in overdose, HIV, and hepatitis C transmission. Bayoumi and Zaric (2008) calculated the direct medical cost savings to the Canadian health system at $14 million over ten years. Another study suggested that Insite creates $5.12 for every dollar spent through increased lifespans and reductions in future expenditures (Andreson and Boyd, 2010).

There are obvious difficulties in measuring the financial benefits of avoiding public nuisance. No studies measure reduction in bloodborne diseases among non-SIF clients such as law enforcement or health care providers, much less the general public. No attempts have been made to put a dollar amount on the improvements in quality of life for people who live and work in urban areas where drug use and dealing are present. Overall, the validity of such cost-effectiveness studies is questionable. Even Health Canada’s summary report of the first five years of Insite’s operation cites these studies with the disclaimer “the EAC were not convinced these assumptions were entirely valid” (Health Canada 2008).

Opportunity Four: Public Health and Safety

Improvements in public order are cited as one of the primary benefits of SIFs. Paradoxically, increases in street crime and public drug use are feared by many potential SIF neighbors. There is a significant amount of anecdotal and quantitative research on this topic, nearly all of it neutral to favorable (Zobel 2004; MSIC 2003; Wood 2004).

Most of the literature reports on the experience of neighbors and businesses in the vicinity of a SIF. Several studies funded by municipal governments suggest benefits of SIFs. Particularly, SIFs can improve public order by “doing away with open drug scenes, decreasing drug use in public places, recovering used syringes, and reducing the impact of drug problems on residential areas,” according to a study funded by the Swiss Office of Public Health (Zobel 2004). Another study of a SIF in Sydney found no increase in crime, no decrease in public amenity, and general acceptance of the initiative by the community (MSIC 2003). A Vancouver study showed significant decreases in public injecting, discarded needles, and injection-related litter in the neighborhood of Insite (Wood 2004).

In addition, drug users also experience improvements in safety and order due to SIFs. One of the most common benefits cited by users of SIFs is a feeling of safety not experienced while injecting elsewhere (Fairbairn 2008). Intoxicated injectors disproportionately fall victim to assault, rape, and property crimes. While crimes against drug users are by nature difficult to measure, there may be significant indirect benefit from the safety of a SIF. A feeling of safety is likely to result in safer injecting practices, such as taking more time to sterilize skin and needles, cooking and filtering drugs, and testing drugs by dividing a dose into two shots (Jozaghi 2013). Most users at Insite and another Vancouver injection facility believed that SIFs saved lives (Milloy 2008).
These opportunities to improve the health of PWID and community safety have been encapsulated into six main objectives of supervised injection facilities, or drug consumption rooms in the European parlance. These objectives were distilled from years of experience in the seminal report on drug consumption rooms, a 2004 white paper from the European Monitoring Center for Drugs and Drug Addiction (Hedrich 2004). The objectives are:

1) To reach as much of the target population as possible. This objectives refers to long-term injectors, street injectors, and other marginalized populations not in treatment.
2) To provide a safe environment that enables lower-risk, more hygienic drug consumption. Naloxone availability is a key aspect of this objective.
3) To reduce morbidity and mortality. In addition to reducing overdose deaths, this entails longer-term improvements in health through education and behavior changes.
4) To stabilize and promote the health of service users. This is a longer-term goals, relating to increasing access to health care, drug treatment, and other social services.
5) To reduce public drug use and associated nuisance. This goal addresses the drug scenes common in large cities where sales are transacted and drugs consumed.
6) To prevent increased crime in and around consumption rooms. This objective refers to acquisitive crime as well as drug sales inside and outside the facility.

The most comprehensive meta-analysis of supervised injection sites suggests that SIFs achieve these objectives. While the analysis was limited by its geographical scope (most studies were conducted in either Vancouver or Sydney), it is the best available indication of SIF efficacy to date.

1) The most common SIF client is a male between 30 and 35 years of age. Many of these clients engaged in sex work or had a history of overdose, daily injections, and bloodborne diseases. Before-and-after surveys of PWID who stated an intention to use a SIF showed that about 75% of them did use a SIF regularly.
2) The studies indicate that SIF users inject more hygienically after the establishment of a facility. Studies from Vancouver suggest that SIF users share needles less frequently and reuse their own needles less frequently. However, there has not been a convincing demonstration that SIFs on their own reduce transmission of HIV and Hepatitis C.
3) Reduction in overdose is perhaps the most logical outcome of a SIF. The availability of health care professionals and a medication that can reverse overdoses meant that no study in this meta-analysis observed a fatal overdose at a SIF. Furthermore, overdoses in the neighborhood of Insite, Vancouver’s SIF, declined by 35% after the site started operating. Sydney found that ambulance calls for overdoses decreased by 68% during the SIF’s operating hours.
4) One commonly-sought health service, drug treatment, may be associated with attendance at a SIF. Detoxification services and initiation of methadone both increased in Vancouver for users of Insite and many clients utilized wound care services.
5) Significant reductions were noted in Vancouver for the number of public injections, syringes dropped, and injection-related litter. These were confirmed both by self-report and third-party counts. In Sydney, a community survey revealed that several stakeholder groups noticed less public injection and injection-related litter.
6) No studies have demonstrated changes in drug dealing after SIFs have opened. Most such studies were intended to show noninferiority (that is, a lack of an increase in crime, as opposed to a decrease) and several using police department crime data have indicated that acquisitive and transactional crime do not increase after a SIF is established.

In addition to the goals outlined above, this meta-analysis indicated neutral or positive externalities of a SIF. Two studies indicated that a SIF does not increase the number of PWID in the area, suggesting that the “pull effect” or “honey pot” often suspected of social services for drug users might not apply. Furthermore, surveys of residents and workers in the neighborhood of Sydney’s SIF showed that a majority of residents supported the facility and thought it had achieved some of its goals.

However, there are major objections to the evidence into the efficacy of SIFs. Besides the limited geographical scope of studies—most of which come from Insite in Vancouver—there are also methodological and potential ethical problems with these studies. First, there is criticism that articles on Insite lack scientific rigor. “The published evaluations and especially reports in the popular media overstate findings, downplay or ignore negative findings, report meaningless findings and overall, give an impression the facility is successful, when in fact the research clearly shows a lack of program impact and success,” states Dr. Colin Mangham (2007).

There are also criticisms of conflicts of interest regarding the scientists who research Insite. Many of the researchers who evaluate and publish on Insite also advocated for its establishment. Therefore, there may be an incentive to publicize positive findings that are more likely to result in Insite’s survival and increased financial support. However, virtually all the prominent objections have been raised by anti-drug organizations and researchers affiliated with them (Landolt 2011 and Christian et al 2012). Furthermore, findings that support the efficacy of SIFs have been published in a variety of highly respected peer-review journals including The Lancet, BMJ, and New England Journal of Medicine (Christian, 2012).

While supervised injection was long confined to harm reduction literature and a few scholarly studies from Vancouver and Sydney, Australia, it has in the past year arrived in the mainstream media and politics. While there are still no SIFs operating openly in the USA, several municipalities have publicly explored the idea of opening a SIF to combat public injection and overdose. Communities in California have for several months explored the legality of opening a SIF. California AB 2495, introduced by Stockton Assemblywoman Susan Eggman, “would allow communities to choose to offer supervised consumption services to address local health and public safety concerns.” On April 5th, the state legislature convened a committee meeting on the feasibility of supervised injection (Drug Policy Alliance, 2016).

Boston recently unveiled plans to open a “safe room” where opioid users can “come if they’re high and they need a safe place to be that’s not a street corner, and not a bathroom by themselves, where they’re at high risk of dying if they do overdose.” Although the sponsors of this location state that “it’s not a place where people would be injecting,” it seems a small leap from a place like this to a full-service supervised injection facility (Bebinger 2016).

In February, Svante Myrick, the mayor of Ithaca, New York, unveiled a detailed plan to open a SIF. “The Ithaca Plan: A Public Health and Safety Approach to Drugs and Drug Policy” proposes a four-point plan including prevention, treatment, and law enforcement approaches in addition to supervised injection.
While there remain significant hurdles at the state level to legalizing such a facility, some prominent state politicians have voiced support for the proposal (Foderaro 2016).

B. Problem Statement

A person overdoses on drugs every two days in Denver County (Colorado Coalition for the Homeless 2014). In the city as well as the state at large, overdoses are a major cause of death for Coloradans. The state was ranked as the second-worst in the country for prescription misuse rates. To combat this phenomenon, in 2013 the Colorado Consortium for Prescription Drug Abuse Prevention was created to “established a coordinated, statewide response to this major public health problem” (Colorado Consortium 2016).

According to Denver County Medical Examiner Data, 1112 people died of a drug-related cause between January 1, 2009 and December 31, 2015. The majority of these deaths, 60.3%, involved at least one opioid. Of these deaths, pharmaceutical opioids were mentioned about twice as often as heroin. There was some difficulty identifying the primary causative agent in these deaths, since the medical examiner data do not differentiate between primary and secondary causes. However, the ratio of pharmaceutical deaths to heroin deaths corresponds closely with nationally available data on overdoses.

Nationally, the 2014 death rate due to pharmaceutical opioids was 5.92 per 100,000 people; the corresponding rate for heroin was 3.31. In Denver, those rates in 2014 were 11.54 for pharmaceutical and 6.49 for heroin, both roughly double the national averages. While cities generally have higher overdose rates than suburban and rural areas, it is unlikely that this difference completely accounts for the higher rate in Denver. It is unknown how many of the pharmaceutical overdoses involved injection, but is likely that the proportion of heroin-related deaths due to injection is near 100% in Denver.

![Opioid Overdose Rates in Denver](image)

(Denver County Medical Examiner, unpublished data)

While overdoses on some drugs are not amenable to intervention, opiate overdoses are easily reversed with an inexpensive medication called naloxone. Naloxone distribution has cut down overdose deaths
significantly. (Bennett 2011 and DPA 2015) Supervised injection facilities not only administer but also distribute naloxone to participants, potentially reducing overdoses in two ways.

The primary barriers to SIFs are cost, participant buy-in, community acceptance, and reluctance to promote illegal activities. This project involves identifying the particular local barriers to a SIF and development of policy to address these barriers.

II. Methods

The primary goal is to assess the feasibility of a supervised injection facility in Denver. This exploratory project assesses the acceptability of a Denver SIF to potential clients as well as community stakeholders and power brokers. The project makes recommendations based on a review of existing literature and structured interviews with key stakeholders. Discussion regarding the political will, economic necessity, client demand, and feasibility of establishing a SIF is provided.

A. Public health theories

Supervised injection relates closely to several well-known public health theories, including the Health Behavior Model and Social Cognitive Theory. The Social Ecological Model, however, most closely resembles the multiple facets of drug addiction. Outside the individual, whose behaviors occupy a central role in drug addiction, lie several concentric circles of interaction. Addiction is a quintessential example of the principles of the Social Ecological Model, and a supervised injection facility can address some of the conflicts that face injection drug users in the microsystem, mesosystem, and exosystem (Bronfenbrenner, 1979).

Despite these perspectives, never has supervised injection proceeded under the aegis of public health alone. There are several theories of policy change that relate to a potential SIF (Miller, 1990). Kingdon’s “Windows of Opportunity” occurs when a problem stream, policy stream, and political stream align. This would seem to be the case with opioid overdose at this point (Kingdon 2003).

Baumgartner’s Theory of Punctuated Equilibrium is also highly relevant to supervised injection. This theory helps take advantage of sensitive windows when media and the public have their attention on a particular issue, which definitely describes the current state of the opioid crisis in the US. While supervised injection itself may not qualify as seismic change in drug policy, it could herald a shift away from punitive drug policies in America (Baumgartner, 2009).

Supervised injection can also benefit from better messaging. Whereas many people might be reluctant to endorse “legal shooting galleries,” many more people support the idea of overdose prevention. Framing supervised injection as a public health measure to keep people alive and keep public areas safe is an example of Prospect Theory, which states that reframing an issue into a larger context (i.e., overdose prevention) and changing how options are presented can dramatically shift the likelihood of support (Tversky and Kahnemann, 1979).

B. Sampling and Surveys

I sampled potential SIF clients through a random sample of attendees at the Harm Reduction Action Center, a large syringe access program where I conducted my service learning project. I began by asking the first person to enter HRAC after 9, 10, and 11 AM to interview with me. Surveys were conducted on
different days of the week to randomize the sample. This method also avoided utilization of any participant data to identify potential interview subjects.

This constitutes a convenience sample, since HRAC users are self-identified needle drug users; identification of random injection drug users outside HRAC would be difficult, invasive, and potentially dangerous. Surveying at HRAC allows clients a safe environment to complete an interview; interviewing outside HRAC would involve myriad privacy concerns and distractions. Interviewing clients at an existing syringe exchange is very efficient as well, since HRAC clients would be very likely to use supervised injection if it were available. Supervised injection facilities attract many marginalized, often homeless PWID. Many HRAC clients fall into this demographic as well.

I also interviewed non-client stakeholders, including health professionals, local government administrators, and business owners. I contacted stakeholders through professional networks, mostly established contacts of HRAC’s staff, and used chain referrals to gain several additional subjects. I utilized a methodology for identifying and contacting community stakeholders as outlined in Strike’s 2015 paper on ambivalence toward SIFs. Law enforcement officials were originally included in this group of stakeholders, but all that I contacted were unable to gain permission from their superiors to speak with me.

These interviews took the form of a semi-structured interview common to all stakeholders with an additional section specifically for people who inject drugs. Questions were designed with prior surveys in mind. Particularly, I examined a similar study by Bayoumi and Strike (2012) on the feasibility of SIFs in Toronto and Ottawa for questions. I also looked at National HIV Behavioral Surveillance questions specific to Denver, which helped with question wording as well as establishing intervals for response choices as necessary. Topics for clients included specific drugs and frequencies of use, locations of drug use, willingness to utilize a SIF, and perceived benefits and barriers of SIF use. Community stakeholders were spared the questions regarding drug use. The majority of their questionnaires focused on qualitative reasons for support or opposition for a SIF (See Appendix A for survey questions).

Early in the study, it became evident that the sampling techniques were oversampling males and methamphetamine users. Therefore, I utilized purposive sampling to accrue females and users of other drugs, mostly heroin. I asked staff members to direct me to females and heroin users in order to accomplish this.

I set the sample size at 40 because a widely utilized 2010 meta-analysis by Mason suggested that for qualitative research, 30 subjects is an adequate sample size. Another study found that, for homogenous samples, as few as five interviews are adequate to develop over ninety percent of themes (Guest 2006). The incentive—a $10 gift card to a local grocery store—proved to be sufficient compensation and there was no trouble accumulating subjects in this setting. Interviews with other stakeholders, however, were limited by time constraints and bureaucracy. I attempted to interview at least four individuals from each stakeholder group and was successful at recruiting from all groups except law enforcement.

The study is paramount to building a reputable case for the establishment of a local SIF. Even the most logical and compelling case for a SIF needs to be justified by data, and the survey will help to establish the necessity and acceptability of a SIF locally. The review of past studies helped me to calibrate the findings from my survey data and gauge the relative utility of a SIF, given the experiences of previously established SIFs.
III. Results

The analyses of data consist of four main facets. First, I perform statistical analyses of data from the survey. Next, I analyze the qualitative responses from clients and community stakeholders to identify barriers to establishing a SIF as well as opportunities to improve the acceptance of a SIF among PWID and the community. Third, there is a mapping analysis of client data leading to recommendations for likely SIF locations. Finally, I provide cost-effectiveness and cost-benefit analyses of a potential SIF in Denver.

A. Quantitative

The survey respondents comprised a fairly representative group of people who inject drugs in Denver. Purposive sampling was successful in capturing responses from the underrepresented group of women and trans individuals.

![Denver Injection Demographics](image)

(CDC, 2015) All figures except age are in percentages. Genders are self-reported. Age is median years. Bloodborne infections use self-report data for my survey and combined self-report/in-house testing data for HRAC and NHBS. Drug use figures include any use in the last six months.

The primary comparison group is HRAC’s internal intake survey, which is given to clients when they present for the first time. The other comparison group is drawn from the quadrennial National HIV Behavioral Surveillance survey, for which I obtained local results. This gives a much larger sample of PWID which is also locally representative.

All figures are within standard margins of error except for meth use and hepatitis prevalence. It is important to note that the median duration of injection in my survey was four years, whereas the HRAC intake surveys were taken when clients first presented to the agency, when many of the survey-takers were newer to injecting. The higher rates for methamphetamine usage, HIV and Hepatitis C may also reflect more frequent and more dangerous injection practices of a largely indigent population, whereas NHBS recruited subjects more broadly.
For drug of choice, figures are not comparable to nationally available data because I utilized purposive sampling, trying to oversample heroin users and women. The purpose of this oversampling is that, while a needle exchange targets all injection drug users, supervised injection facilities specifically target opioid injectors. I sought out opioid injectors during the second half of my survey because I noted that many of the first twenty were methamphetamine users. In the end, of my 40 subjects, 21 identified methamphetamine as their drug of choice, 17 identified heroin, and 2 identified cocaine as their drug of choice. Only injectable drugs were accepted for responses to this question.

All figures in percent. Private refers to house/apt and hotel/motel, semi-private to public bathroom and car. Detox/rehab, shelter, and abandoned buildings omitted due to low percentages. Data from most recent injection omitted due to similarity with most frequent.
Public bathrooms and houses/apartments vied for the most popular settings for injection among the survey respondents, depending on how the question was asked. Virtually identical numbers of respondents (85% vs. 82.5%) stated that they had injected in these two settings in the last six months, while similarly identical proportions stated that they injected in these settings most frequently (30% and 27.5%) and most recently (22.5% and 20%).

Camps and streets/alleys were the next-most popular settings for injections. Seventy-five percent of respondents reported injecting in the street or an alley in the last six month, while 57.5% had done so in camp. Both camps and streets/alleys were the site of the most recent injection for 17.5% of respondents.

Detox and rehabilitation facilities, shelters, and abandoned buildings were omitted from this graph due to low frequencies of use. Very few participants reported injecting in these settings, and none of the respondents reported favoring such locations.

Of the 85% of respondents who reported injecting in public bathrooms, four locations comprised the majority of responses: the public transportation system, McDonald’s, King Sooper’s grocery store, and the library. Relieving the risk and utilization burden faced by these locations is a primary goal of a supervised injection facility.

It is clear that, for survey respondents, injection occurs mostly in public, or at least in publicly-accessible locations. This is very important data for making the case for a SIF. Many of these locations are patronized by the general public, including children. The following graph shows that both the most recent and most frequent injections occurred in public and semi-public locations. These findings mirror those of a similar survey that found public and semi-public injections sites are more common than private venues among syringe exchange clients (SIF NYC, 2015).
The respondents to the survey skew toward frequent injection. In fact, the vast majority (65%) of respondents indicated that they inject at least once daily, and one quarter of respondents stated they shoot up three or more times daily.

Fortunately, willingness to utilize a SIF is high. Eighty-five percent of respondents stated they would use a SIF without reservations, while 7.5% stated they might use a SIF depending on the policies. Only 7.5% said they would not use a SIF. One of the “maybe” respondents simply wanted the facility to be called “safe injection” instead of “supervised injection”, while another stated that she would attend a SIF only if she could get assistance finding a vein. Of those who would not use a SIF, 2 of the 3 reported suspicions that the government would monitor or harm them because of their use of the SIF.

Many of the frequent injectors, particularly those without homes, reported that they would use the facility for all of their injections, although several noted that the intensity of withdrawal symptoms might lead them to use outside of the SIF.
A majority of respondents (62.5%) stated that they would utilize the facility at least once a day, while another 25% stated that they would use it several times a week. It is possible that the relatively high willingness to utilize a SIF results from the proximity of many respondents to possible SIF locations and, presumably, the location where they obtain drugs.

The vast majority (92.5%) of clients agreed that supervised injection could improve three of its four main endpoints: reducing overdoses, encouraging safer drug use, and reducing neighborhood problems. Clients were less optimistic (82.5%) that supervised injection could lead to decreases in HIV and hepatitis C transmission. (compare to I-track, p. 171 from TOSCA survey) Several of them mentioned that the primary route for HIV and hepatitis—needle sharing—is already obsolete for them because of syringe exchange.

A prior study in Toronto and Ottawa identified several instrumental barriers to patronizing a SIF such as distance. Distance was not considered very important by respondents in this survey, perhaps because of the relatively high concentration of drug dealing and using in downtown Denver. Over 80% of respondents stated that they would walk or bike over a mile, or ten blocks, to reach a SIF, with some respondents stating they would walk much farther. Another 82.5% of respondents reported they would be willing to take public transportation to reach a SIF.

Thirty-five percent of respondents, however, stated that they would be hesitant to utilize a SIF due to the chances that they would be spotted entering or exiting the facility. This proportion was not quantified in prior surveys, but it was mentioned as a potential barrier. This is an important consideration when considering potential locations for the facility.

The reasons for not utilizing a SIF were very similar to those obtained in a study of Toronto’s injection drug users. Similar proportions cited each reason in Denver as well.

<table>
<thead>
<tr>
<th></th>
<th>I do not inject anymore</th>
<th>I do not like to use around others</th>
<th>I would only use drugs at home</th>
<th>I would not feel safe at a SIF</th>
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</thead>
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<tr>
<td>Denver</td>
<td>42.5</td>
<td>35</td>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td>Toronto</td>
<td>34</td>
<td>28</td>
<td>19</td>
<td>14</td>
</tr>
</tbody>
</table>

Public Health Agency of Canada (2006)

**B. Qualitative**

While there are promising effects of a SIF that may be readily quantified, some results are less amenable to measurement. The sense of community, trust, and acceptance that may accompany a supervised injection facility are primary to reintegration of PWID into the community. In fact, eight of the thirty-one respondents who gave subjective responses to the question “What other positive effects do you think a SIF could have?” mentioned the decrease in stigma or improved community acceptance as a primary benefit of supervised injection. Answers included: “humanize users in a safe, comfortable setting,” and “bridge the gap on public acceptability.” It seemed that some respondents felt like a supervised injection facility could become a liminal space between their stigmatized, illegal activities and societal tolerance and acceptance. This desire to rejoin or engage with society builds on the re-enfranchisement that starts with needle exchange and community policing.

Other common responses about benefits of a SIF included safety; this took several forms. One respondent reported that she believed that using in a clean environment could engender safer shooting
practices. Another said that learning about safer practices, by helping “instruct users in proper techniques,” could lead to better shooting practices both inside and outside the SIF. Several mentioned testing drugs for purity. “Knowing purity and having expert help could lead to more controlled use.” And in an interesting turn, the same respondent suggested that purity testing “could lead to more pure dope due to pressure on dealers.”

Another benefit of supervised injection would be the community engendered among PWID and their advocates in the community. One client stated that Denver’s injection scene was “cleaner” than other cities because elsewhere PWID are “lazy, don’t give a f***,” attributing this disparity to the presence of a large syringe exchange program in Denver that stresses responsibility and solidarity.

There were several examples of conflicting viewpoints among clients regarding supervised injection. This is reflective of the internalized autophobia displayed by marginalized groups. A common refrain from client survey respondents was that PWID, in order to become more socially acceptable, need to first improve their behavior. “Not everyone wants to watch you do that... for people who do inject, be discreet.” This paradox was best displayed by a client who said, “As a user, I'm torn between these two things, it's like being bipolar or schizophrenic,” referencing her conflicting desires for a place to use drugs safely but not promote drug use in the community.

There were clearly concerns about a SIF even among the client population. The most common concern of clients was the potential for a SIF to increase drug use by enabling users and lending drug use a further aura of legitimacy. Seven of the thirty-two respondents to the question “what are some other reasons that supervised injection could be a bad idea?” cited the potential to increase use, enable use, or initiate new users. Many respondents cited their desire not to initiate new injectors as a reason why a SIF might be a bad idea.

There was also significant concern that, rather than encouraging a cleaner neighborhood, supervised injection could lead to increased loitering, littering, and drug dealing. A quarter of clients responded with one of these concerns, primarily overcrowding and drug dealing, although a couple clients did admit that the increase in drug dealing could benefit them by creating a convenient and competitive market. This is the so-called, theoretical “honey pot” effect of services for PWID. So far, it has not been seen in most areas of SIFs and needle exchanges (Fast 2008 and MSIC 2003).

Loss of confidentiality was also a primary concern for clients. Seven clients, or over 20% of respondents, stated that a breach of confidentiality would dissuade them from utilizing a SIF. Highlighting the intimate nature of injecting, one client stated “disclosing that part of you to other people... could be dangerous.” A related concern, police surveillance, was mentioned by ten individuals, with one stating that “any inkling of police” would cause him to stop using the SIF immediately.

Of greatest concern was the potential for using a SIF to commit suicide, either on purpose or through careless use. In fact, five people responded that they would not want to receive naloxone in the event of an overdose; while some simply said that naloxone was not relevant to them because they did not use opioids, other indicated that the SIF could be a comfortable place to overdose intentionally: “If someone overdoses in public they're going to rush you to the hospital. I want to have a choice.” Another client stated “I lived many lives and my soul is worn out.” Still another mentioned that naloxone is such an unpleasant experience that death could be preferable; this individual had naloxone once and stated that it was a miserable experience for three days.
Obviously, any death at a supervised injection facility could imperil its existence. Many of the clients mentioned that even a single overdose death at a SIF could dissuade them from utilizing the facility. Over 20% of respondents to the question “What could dissuade you from utilizing a SIF?” included safety or overdose in their answers, with one specifically concerned about intentional overdoses. They indicated that a loss of confidence in SIF staff would likely follow any injury or death on the premises. Two other respondents mentioned that overdoses could confirm their beliefs that supervised injection is part of a government conspiracy to eliminate drug users.

Community stakeholders were also very concerned with reducing overdoses and addiction. However, they differed dramatically on whether a SIF could decrease drug use. Largely, their answers reflected a fundamental difference in the approach to drug policy, one based in abstinence rather than harm reduction. One respondent worried that opening a SIF would “keep people in a cycle of destroying their lives,” but another thought that engaging SIF users could lead to increased referrals for treatment. Many respondents stated they would not support a SIF if it led to increased drug use, even if there were other, more visible and tangible improvements. This ideal of treatment and abstinence is key because it suggests a route for appealing to the public when discussing a SIF.

Another major difference in the community stakeholders’ responses was they tended to focus on public order and safety issues. Several people stated that they hoped a SIF might move drug use “out of the public eye” without regard for its effects on the SIF’s clients. Public order was a concern for all three types of community stakeholders, which included business owners, health professionals, and city employees. A health professional who owns his own business stated that “reducing neighborhood problems is the public’s number one. We’ve treated HIV clients, put hands on to do CPR,” implying that, in his health professional role, he understands the benefits of harm reduction efforts but that he still wishes for an orderly city in which to run his business.

Many of the community stakeholders found it difficult to answer questions of the potential benefits and drawbacks of a SIF because of their lack of familiarity with injection practices and addiction. Their responses focused on crime, hazardous litter, and moral aspects of drug use. It was a common refrain, particularly amongst health professionals, that they would prefer scientific data on the effects of supervised injection prior to deciding on their level of support. This suggests one way to target this small but important stakeholder group, but other groups desired data as well. One business owner specifically wanted to know the number of PWID and how often the SIF was utilized before he made a decision on support. Yet another wanted to know about drug purity.

Some of the community stakeholders’ responses were colored by a small number of experiences with addiction, especially those of a friend or family member. For instance, one business manager had a child who was a heroin addict and had overdosed nonfatally. She agreed that heroin should be legalized, “but no other drugs.” Yet another respondent was an alcoholic himself and advocated for abstinence-based recovery; he opposed a SIF because it would be “enabling.” Appealing to these people, who have very tightly-held and distinctive views of drug use and addiction, could be enhanced by testimonials and personal stories from those affected by supervised injection.

Another common theme from the respondents was an unwillingness to violate federal drug laws. Particularly, city government officials expressed a need for policy changes at the city, state and federal levels prior to supporting a SIF. One city administrator reported that his opinion on SIF would necessarily
change if his superior supported it; an elected official stated that she would need legal changes because “my primary barrier to support is, ‘How do I explain this to constituents?’”

One aspect of the qualitative studies that I had not considered was the continuum of work and non-work roles of the community stakeholders. Injection can intrude at any point in this continuum.

For instance, the business owner whose son is addicted to heroin stated that, of 4000 customers at her business each day, roughly 400 use their bathroom and many of them are homeless and injecting drugs in the bathroom. This business hired a security guard to patrol the parking lot and installed low lighting in the bathroom to discourage injecting in the bathroom, as veins are harder to find in the dark. Still, customers injected in the bathroom. The management explored using keyed or coded bathrooms but were discouraged by their corporate officers from implementing this solution. However, after three overdoses in several months, corporate relented and they have diminished the problem with entry codes on the bathrooms.

But recently, a customer at this business had evidently injected in the bathroom and was wandering around the store. She sat down at the blood pressure cuff and put her head down; when contacted by employees she had labored breathing and a blue tinge to her lips. CPR was administered and, against company directives, this manager decided to administer naloxone. The reversal was a success and the customer woke up prior to EMS arrival. This harrowing incident was met with silence from the corporate overseers, but the business has continued to use naloxone in overdose situations, with no deaths on-site in recent memory.

This is not the entire story, though. The same business was troubled by needle disposal in the parking lot. The manager had two permanent disposals installed in the parking lot but still people leave needles on the ground, rendering the employees vulnerable to needlesticks even after they have clocked out and left the store. Driving out of the lot, she witnesses people selling and using drugs along the nearby river. While for many people the specter of injection would relent upon exiting the highway in the suburbs, for her the worry does not stop, as her son is constantly on her mind. Injection truly pervades her life.

Another city worker reported that dealing with injection drug use is a daily concern for his department, which is charged with cleaning up homeless encampments after they are abandoned or become a public health hazard. He stated that, by his estimation, over 50% of encampments contain used needles. The day of our interview the respondent had helped with cleanup of 20 needles in a camp. He stated that one camp had 312 needles, all requiring careful cleanup. He stated that they sometimes find needles on playgrounds or in the grass near trails.

One city administrator reported that his department had to close down bathrooms after PWID overtook a city bathroom and clogged the toilets with injection-related litter. Reopening the bathrooms required the department to hire a full-time bathroom monitor to protect their facilities and monitor for overdoses, costing the city tens of thousands of dollars each year. This department has had five employees sustain needle sticks in the last three years. This requires testing and, potentially, pharmacological prophylaxis for six months in addition to the psychological angst of dealing with chronic bloodborne infection. For these employees, injection is not only a work-related hazard; it is a constant peril. Should an employee acquire a bloodborne disease, it would be another example of the pervasive
effects of public injection, having carried over from a workplace concern to a personal health crisis with the potential to cause far-reaching effects in finances, intimate relationships, and activities.

C. Mapping

Since supervised injection facilities should be located conveniently near PWID, I surveyed respondents on their most frequent locations. In order to elicit the most honest responses, I worded this question to consider the anonymity and transience of many survey respondents, asking, “near what intersection do you spend the most time?” Most respondents had a definite answer for this question. I used ArcGIS geospatial mapping to analyze these data (Esri Corporation, Redlands, California). Respondents’ locations were clustered along a major east-west thoroughfare through Denver, Colfax Avenue. While there is a wide, eight mile east-west distribution of locations, people live in a narrow band of less than two miles from north to south. Bisecting this band is Colfax Avenue. The geographical center of these coordinates, 14th and Delaware, is very close to Colfax. I calculated the percent of respondents living within ½ mile, 1 mile, and 1 ½ miles walking distance of the proposed central facility, as well as those within ten minutes’ driving time.

The following map shows where PWID live in Denver (orange pins), the central location for those pins (green tack), and radii of ½, 1, and 1 ½ miles from that central location (red, yellow, and blue discs, respectively). Colfax is the long east-west thoroughfare that runs through the center of the discs. The Cherry Creek, home to a high-intensity drug dealing area, arcs southeast (dark blue) through the discs.

If walking or biking only are considered, the central facility would reach 45%-55% of PWID. Only 25% of PWID identified themselves as living within a half-mile of the proposed location; this number rose to 42.5% and 55% for radii of 1 mile and 1.5 miles, respectively. Over 80% of respondents reported that they would be willing to walk or bike over a mile to reach a SIF, with 12.5% more stating they would walk between a half-mile and a mile. Anecdotally, several people reported walking miles at a time through difficult conditions to obtain drugs, stating that they would be willing to walk a similar distance to use drugs privately.
These are likely underestimates of the convenience of the proposed location, though. Almost all respondents anecdotally reported that they visit downtown to purchase drugs or to access services, or simply for social reasons. Furthermore, I only included distances up to one mile (ten blocks) because I utilized prior surveys when developing options; I quickly learned that many people would be willing to walk much further to utilize a SIF, so it is possible that “walking distance” includes more than 55% of respondents.

A single central facility would be far more accessible to PWID in Denver if they are willing to use public transportation and can afford it. This is due to the centralized drug market located near Colfax, the main thoroughfare. Several transit lines, including bus, light rail, and train, converge on Colfax. Fortunately, over 80% of respondents indicated that they would be willing to use public transportation to access a supervised injection facility; in addition, several respondents with access to cars stated that they would not need to use public transportation because they could drive themselves.

This map displays the respondents’ living locations as well as the purple 10-minute driving radius around the proposed facility at 14th and Delaware. The proposed location is highly accessible by automobile or public transportation, even allowing for some residents of nearby cities and suburbs to reach a supervised injection facility quickly. Almost 80% of respondents live within a 10-minute drive of the proposed facility according to standard travel times.

Looking at potential locations of a supervised injection facility, it is important that a potential SIF be located not only in the right part of town, but in the right venue. A high-traffic area, particularly one that is distant from residences, is ideal. Some respondents also noted that they would prefer a rear
entrance so as not to be seen entering the SIF, although relatively few (35% of respondents) worried about being seen entering such a facility.

This map displays the geographical center of where respondents prefer a SIF to be located (blue star); some of the individual locations are visible (grey dots). These locations cluster on a single street, Colfax; over 55% percent of respondents preferred that a SIF reside on this street, and nearly 50% identified a location on Colfax between Speer and Pearl (roughly the length visualized) as the ideal location for a SIF, demonstrating a very high level of agreement about the location of a SIF. There was also a smaller cluster of responses further east on Colfax, providing a potential satellite location for a syringe exchange program or SIF.

These maps show that there is a high level of concordance between where people spend their time and where they use drugs. The center of preferred SIF locations is within a half-mile of the center of living locations, strongly suggesting that the Capitol Hill/Civic Center/Golden Triangle area is an excellent target for Denver’s supervised injection facility.

An ideal location would have close proximity to existing health care services. This would reduce costs, as the establishment of the SIF would be less likely to duplicate services of nearby existing facilities; improve neighborhood acceptability, since neighbors would already be used to the foot traffic of medical clients; and increase usage, since clients would already be in the neighborhood of a SIF. For example, the St. Peter Center in Vancouver resides at a previously existing AIDS Care Center. Its clients generally have better viral load suppression than other AIDS patients because injection brings their clients into contact with care providers.
D. Cost-Effectiveness and Cost-Benefit Analyses

In order for a SIF to be effective, it needs to be utilized frequently, particularly by clients who are at highest risk for overdose or bloodborne diseases. Projecting the use and utility of a SIF is difficult because of the illegal nature of the activities conducted therein; however, a ceiling for use can be established by simply asking people whether they would use such a facility. A method for estimating potential SIF use, as well as cost-effectiveness measurement, was suggested by Bayoumi and Strike (2012).

The outcomes of interest in this analysis include: 1) reduction in overdose 2) reduction in Hepatitis C and 3) reduction in HIV. These analyses will be performed separately due to the difficulty of combining them.

In order to estimate the costs of a SIF and much of the data on injection drug use and frequency, I assumed that many of the parameters would be proportional to those in Vancouver, the source of almost all the reliable quantitative data on supervised injection. After finding the estimated number of PWID in Vancouver—13,500 (McInnes 2009)—and PWID in Denver—7,500, based on local estimates and agency data—I adjusted other figures assuming that costs and other factors would be proportional to the ratio of PWID. Therefore, to estimate the cost of a SIF, I used Insite’s cost and simply adjusted to a factor of 0.55, the ratio of PWID in Denver to that of Vancouver. I arrived at a figure of $1.24 million in American dollars.

To estimate the number of people who inject in Denver, I used a combination of national statistics applied to the local population, with specific estimates from local agencies. HRAC, the leading harm reduction agency, served 3100 unique clients last year (Bellamy, personal communication, 2016). Simply multiplying Denver’s population (650,000) by the most recent national prevalence of past-year injection (0.3%) yields 1950, which is clearly too low given the number of people accessing services at HRAC (US Census 2010, Lansky 2014). Using the population estimate for metro Denver (2.8 million) and the same estimate of past-year use yields 8400 (US Census 2010, Lansky 2014). A 2010 estimate by the Denver Office of Drug Strategy pegged the population of PWID in Denver at 5000. A reliable estimate based on mathematical modeling from Vancouver, a city with a similar population, is 13,500 (McInnes, 2009).

I chose 7500 as an estimate for the number of PWID in Denver since it is a reasonable compromise of the preceding estimates. It also reflects a pattern from other cities in which about 40-50% of PWID engage with harm reduction services. This seems very reasonable when analyzing other data sources. Assuming that people overdose at a rate proportional to the number of injection users, about 50 people would be expected to die from overdose by injection in Denver each year given a crude death rate by overdose of .67 per 100 person-years (Mathers 2013). From 2014 Denver Medical Examiner data I analyzed, about 48 people died from fatal overdoses that mentioned heroin.

How many of these could be prevented by a supervised injection facility? This is highly dependent on the details of the operation and the assumptions. The operation’s hours, location, reputation, and trust among users would determine the proportion of totals injections that are supervised at the facility. In order to conduct the cost effectiveness analysis, we have to assume that all injections are at equal risk of overdose.
The number of deaths and infections prevented is directly proportional to the percent of total injections in Denver that are supervised at a facility. (Health Canada, 2008) I assumed that a SIF in Denver would have the same uptake as Insite in Vancouver, and that PWID would perform the same number of injections per person.

1. Overdose

To assess the costs of overdose, one must examine fatal and nonfatal overdoses. Comparing these two are difficult because the costs are of very different natures. Fatal overdoses involves fewer direct costs; sometimes transport and coroner costs are the only associated costs. However, the loss of quality-adjusted life is high, because many of those who overdose are young and otherwise healthy. For nonfatal overdose, direct medical costs predominate. While there are some overdoses that result in permanent disability due to anoxic brain injury, these are thought to be rare and incidence rates for this type of overdose are not available. Therefore, I will examine the direct medical costs of both fatal and nonfatal overdose as well as the loss of life for fatal overdose.

While the Denver Medical Examiner does not break out overdoses by injection, an average of 36 people died each year between 2009 and 2015 from heroin overdoses; the majority of these can be assumed to be injection-related because Denver’s heroin is primarily black tar, which is most often injected. This is concordant with prior estimates of the yearly opioid overdose death rate, 0.67% (Lansky 2014) and 0.8% (Hall 2000). Assuming that Denver had between 5000 and 7500 PWID during this period and that 60% of those PWID injected heroin, the overdose rate for people who inject opiates in Denver was 0.8% to 1.2%. Only opioid overdoses were included in this analysis, because findings from other SIFs have shown that more than 90% of overdose interventions involved opioid overdose. Furthermore, the savings from non-opioid overdoses are negligible, since there is no equivalent antidote for other drugs.

For nonfatal overdose incidence, only indirect data are available. Two studies have extrapolated nonfatal overdoses from fatal overdoses. A large meta-analysis in Australia found that the nonfatal overdose commonly outnumber the fatal overdose rate at a ratio of roughly 25 to 1. This also corresponds well with the available data for Denver. My study found that roughly 22.5% of PWID reported at least one overdose in the past year. This is between 19 and 28 times the fatal overdose rate, falling in line with the prior study. However, this underestimates the actual overdose rate, because the PWID are not limited to a single overdose in a year; on the contrary, a good predictor of future overdose is prior overdose. In my study, 7.5% had overdosed once in the last year, 7.5% twice, and another 7.5% three or more times. Therefore, the weighted nonfatal overdose rate (total overdoses divided by number of people who inject opioids) might be as high as 45%.

The costs for nonfatal overdose are high when EMS is summoned. A 2014 study estimated that, when EMS is called, hospital admission occurs 55% of the time; discharge after ER treatment happens 45% of the time. The costs for both outcomes are significant. Admitted patients stay, on average, 3.8 days at a cost of $29497. Patients treated in the ER cost $3640 (Bachhuber 2014). These seem like huge costs, considering that hundreds of overdoses occur in Denver every year. However, with the widespread distribution of naloxone to opioid users, very few overdoses actually result in a call for emergency services. According to the Harm Reduction Action Center, only 22% of overdoses result in a call to EMS (Bellamy 2016, Personal Communication).
The financial costs for fatal overdose are relatively low. While some fatal overdoses result in intensive intervention, others result simply in a transport and an autopsy. Ambulance transport costs roughly $1000 and an autopsy $1275 (Propublica 2011). How many cases result in more intensive intervention is unknown.

I performed cost-effectiveness analysis and cost-benefit analysis under two separate assumptions to calculate the economic effects of a SIF in Denver. One uses yearly incidence data on the population of PWID in Denver and another projects the utilization of a SIF in Denver based on Vancouver statistics and imputes the number of fatal and nonfatal overdoses from that.

These separate analyses of the fatal overdoses prevented resulted in remarkably similar results. The results suggested that a SIF could prevent 2.78 to 2.85 overdose deaths per year. This assumes that the overdose rates, both yearly and per injection, do not change when one utilizes a SIF. The direct cost savings from preventing these deaths were small, consisting only of ambulance transport and autopsy costs. While intensive intervention might occur prior to death in some overdoses, the frequency of intensive intervention is unknown. The total costs associated with death were $2275 per person (Coffin 2013), although this is likely a significant underestimate due to the attendance of law enforcement and rescue personnel at fatal overdoses.

The same analyses suggested that a SIF could prevent many hospital admissions through early intervention. Between 67 and 71 nonfatal overdoses could be expected to occur at the SIF. While the intervention in the SIF is the same—naloxone by injection or insufflation—SIF staff would be much more likely to intervene quickly and prevent the most expensive part of nonfatal overdoses, the ambulance ride, ER visit, and hospital admission. Were naloxone not widely available, prevention of nonfatal overdose would be nearly cost-saving; however, now only 20% of nonfatal overdoses result in a call to EMS (Bellamy 2016, personal communication), cutting the costs of overdose to just a vial of naloxone in roughly 80% of cases.

The analyses suggest that supervised injection could be cost-effective with regard to overdose but is unlikely to create savings. The cost-effectiveness calculation is highly sensitive to average age at overdose, but assuming the average opioid overdose victim is 39 (CDC 2015), the supervised injection facility would cost between $9,400 and $12,000 per QALY saved. The calculation is also sensitive to the rate of repeated overdoses by an individual; currently, I assumes that overdose distribution is stochastic. However, studies have shown that overdoses are highly predictable and perhaps even additive. The more concentrated overdoses become within a population, and the more frequently they occur in an individual, the less cost-effective supervised injection becomes.

In the cost-benefit analysis, supervised injection’s direct benefits are outweighed by its costs by a ratio of roughly five to one. This results primarily from the low direct costs of fatal overdose as well as the uncertainty of how many EMS calls and hospital admissions a SIF might prevent. The following is a flow diagram of the cost-benefit analysis for fatal overdose.
Some modifying variables that might increase the actual cost-effectiveness of the SIF include the utilization by younger injectors (odds ratio 1.6) and utilization by clients with a recent overdose (odds ratio 2.7). If the SIF is able to attract more high-risk injectors then it could prove more cost-effective.
Insite’s mathematical models suggest that 1.08 deaths per year are averted by intervening in overdose events. If all numbers are simply scaled down by 45% since Denver has an estimated 45% fewer drug users than Vancouver, this would indicate that 0.6 deaths per year might be averted by opening a supervised injection facility in Denver, so the actual calculations for Denver suggest that it might prevent slightly more deaths than expected by simple extrapolation from prior studies.

2. HIV

While there are several assumptions that went into the estimate of reduction in HIV infection, there are many variables for which reliable data can be ascertained. HIV allows for the most accurate calculation of cost-effectiveness because there are reliable statistics for it. This is likely due to the prolific research and funding surrounding HIV. There is concordance about HIV prevalence among PWID in the Denver area (3%) (Bellamy 2016 personal communication and Al-Tayyib 2016 personal communication) and excellent data on the transmission probability per act (63/10000) (CDC 2015). I used the following function to arrive at estimates of cases prevented:

\[ I^{**} = np\beta\alpha(1 - \rho) \]

In this equation, \( I^{**} \) denotes the number of cases prevented, \( n \) is the number of injections at the SIF, \( \rho \) is the prevalence of the disease (either HIV or hepatitis C) in PWID, \( \beta \) is the per-act transmission rate from an infected to noninfected individual, and \( \alpha \) is the needle sharing rate.

From the cases prevented, I estimated quality-adjusted life years (QALYs) lost by finding life expectancies and utility functions for people living with the relevant disease. If utilities and prevalence data for different disease severities were available, including asymptomatic HIV versus AIDS and latent hepatitis versus cirrhosis, I adjusted for these differences. I then determined the cost per QALY, assuming that the only costs involved were SIF operation costs.

For cost-benefit analysis, I found the most recent estimates for cost of disease treatment and determined the number of cases that would need to be prevented in order for the SIF to be cost-saving. This only took into account costs directly associated with disease treatment, such as sofosbuvir/ledipasvir for hepatitis, and not secondary costs from syndromic illnesses or complications of deferred care, such as liver transplant.

The primary assumptions that must be made to complete this analysis regard the behavior of PWID with and without HIV and the frequency of syringe sharing among the clientele of a potential supervised injection facility. While data suggest that HIV+ clients who inject drugs are more likely to engage in risky behavior like syringe sharing, whether they share preferentially with other HIV-infected PWID is unknown. Their likelihood to patronize a SIF is also unknown. Furthermore, data are scarce on the rate of needle sharing, particularly in Denver. Intake data from HRAC show that about one-third of new clients had shared syringes in the past 30 days, but it is likely that this number falls dramatically when clients utilize harm reduction services, particularly syringe access. Fewer than 20% of clients I surveyed reported any reuse of needles in the last six months. (Pinkerton 2010)

Even if the rate of needle sharing is 10%, which is most likely a high estimate, the expected number of HIV infections prevented is roughly one every six years. After adjusting for HIV- and injection-related loss of life expectancy and quality of life, this results in an average yearly savings of 2.85 QALY. At $434,558 per QALY, this is well outside the accepted bounds for cost-effectiveness. Considering that this figure
utilized a very liberal estimate of syringe sharing, it is likely that each QALY might come at a significantly higher cost. Hence, it is unlikely that supervised injection in Denver would be cost-effective on the basis of HIV prevention alone.

While this simplistic analysis misses some potential second-degree effects of supervised injection, such as improved syringe disposal and a reduction in the amount of needles in circulation, it is unlikely that any parameters would result in outright cost-effectiveness based on HIV prevention.

The overwhelming difference between Denver and Vancouver is the significantly higher HIV prevalence in PWID in Vancouver, 17% versus 3%, making the likelihood of HIV transmission during syringe sharing far higher there (Pinkerton 2010).

A cost-benefit analysis yields similar results. At a lifetime excess medical cost of $229,800 per HIV infection (Schackman 2015), a SIF costing $1.2 million per year would have to prevent between five and six HIV infections yearly in order to pay for itself. As my calculations indicate, this is highly unlikely.

Putting these data into a larger context validates them. There were 117 documented new HIV infections in Denver in 2013 (Dukakis 2014); roughly 10% of these might be related to injection drug use (drugabuse.gov 2012). Of these ten or eleven infections, it is unlikely that a significant number of them would be prevented by the existence of a supervised injection facility, since less than half of PWID in Denver would be expected to use the SIF at all. Even amongst clients, the proportion of injections done at a SIF is well below 100%.

3. Hepatitis C

Even though hepatitis C now has effective therapies with high cure rates, these therapies carry significant costs and access to them is limited. Nationally, treating all eligible hepatitis C-infected patients in the next five years would cost $37 billion at current prices. Prevention is thus still significantly more cost-effective than treatment (Chhatwal, 2015).

The same assumptions and equations apply here as for the HIV analysis. Again, the using behaviors, injection frequencies, and rates of sharing for PWID with hepatitis C are largely unknown. Therefore, this analysis also assumes similar injection frequencies and similar rates of sharing between infected and uninfected individuals. I also assumed that PWID do not assort into groups based on serotype. In addition, I did not calculate QALY differences for the significant population of PWID coinfected with HIV and hepatitis C, given the complexity of adding another subgroup and the low prevalence of HIV in Denver.

Even with a simplified model, it is apparent that hepatitis C prevention alone would justify a SIF’s cost-effectiveness in Denver. Using highly conservative estimates (including a low 23% prevalence for hepatitis C and a sharing frequency of .01) a supervised injection facility could prevent eight cases of hepatitis C, preventing disease-related mortality and morbidity at a cost of $7597 per QALY (Bellamy, 2016, personal communication and Al-Tayyib, 2016, personal communication). This compares favorably with many current interventions and falls well below the accepted thresholds of $50,000 - $100,000 per QALY often used to judge cost-effectiveness (Neumann et al, 2014).

Whether a SIF could be cost-saving with respect to hepatitis C is less certain. Using an estimated cost per sustained virologic response (SVR) of $58,000, a SIF would have to prevent 21.4 cases of hepatitis C in
order to save money, assuming that 100% of those testing positive received the latest treatment. While preventing eight cases of hepatitis would not be cost-saving, using a more realistic figure for hepatitis C prevalence among PWID of 60% would lead to 26 cases of hepatitis C being prevented. Therefore, the cost-benefit outcome for a SIF with regards to hepatitis C prevention is uncertain and depends on the rate of syringe sharing and true per-act transmission rate.

These estimates are highly dependent on the willingness of payers to fund hepatitis C treatment for people who currently inject drugs. The cost-benefit analysis assumes that 100% of those infected with hepatitis C receive treatment, which is not currently the case. As payers become more willing to fund hepatitis C treatment, the SIF actually becomes more cost-effective; in the current state of affairs, the SIF would actually need to prevent many more cases of hepatitis C in order to be truly cost-saving.

Interestingly, if harm reduction efforts and payment for hepatitis C treatment were to significantly reduce the prevalence of hepatitis C, a supervised injection facility could conceivably become ineffective cost-wise due to the lowered prevalence of hepatitis C. Furthermore, this cost-effectiveness analysis is highly sensitive to the cost of hepatitis C drugs; if prices continue to fall rapidly, prevention efforts would become less cost-effective as treatment becomes more affordable.

Hepatitis C prevention is far more cost-effective than HIV prevention because it has a significantly higher prevalence than HIV in Denver. Hepatitis C is also far more infectious. For accidental needle sticks, HIV is estimated to have a transmission rate of 0.6%, while estimates for hepatitis C transmission range from 1.6% to 10% per needlestick. The per-act transmission rate for purposeful injection drug use is likely significantly higher.

The primary uncertainties in a cost-effectiveness analysis of a potential supervised injection facility are prevalence of injection drug use in Denver and the reduction in needle sharing associated with a SIF. There are also difficulties with delineating the boundaries of a cost-effectiveness study, since PWID from outside Denver may utilize both a SIF as well as health care services in the city, skewing costs higher than would be expected by population-based surveys. Furthermore, the relevance of cost-effectiveness in a multi-payer health care system is uncertain, since the benefits of prevention fall disproportionately to traditional payers while the costs accrue to government and nonprofits.

Even so, the cost of a SIF in Denver would be small compared with current health care outlays. Even public health departments, which account for a small fraction of health spending in Denver, could afford a SIF; the costs could be partially covered by the savings in the criminal justice and health care systems. In Vancouver, the Coastal Health Authority spent $184.8 million last year just on mental health and substance use community services. Insite, the supervised injection facility, cost $2.2 million. This accounted for less than 1.3% of total spending (Vancouver Coastal Health, 2015).

There are other unknowns that may improve a SIF’s apparent cost-effectiveness. First, only the reductions in deaths and quality of life due to overdose, HIV, and hepatitis C were taken into account in this analysis. There is great potential for a SIF to engage PWID in their health care and provide a location for compassionate providers to meet with these clients; this effect has been demonstrated in HIV+ PWID in Vancouver, who had improvements in measures of health in addition to reductions in overdose and sharing. Other SIFs have previously provided information and immunizations during outbreaks (Mathers et al 2013).
Also, this analysis only takes into account first-degree infections; that is, the costs of an initial new infection without considering other people who might be infected by the sentinel infection. Since most infected injection users are infected by other users, preventing one infection could prevent several others in turn. The cost savings may be even greater in Denver, which has a far lower prevalence of both hepatitis C and HIV among PWID than Vancouver does. Prevention efforts for infectious disease are more cost-effective when there is an intermediate level of prevalence, since it is in the range of 50% prevalence when an act of sharing is most likely to result in a new infection.

This analysis also does not attempt to capture savings from reducing skin and soft tissue infections (SSTI), which by some estimates are, financially, the costliest part of injection drug use. It is highly likely that supervised injection facilities could reduce these infections by providing sterile conditions and supplies as well as time to prepare safer injections. SIFs also provide on-site primary care, which could dramatically reduce costs by early secondary prevention of SSTI.

IV. Discussion

There is little doubt that the US is moving toward its first supervised injection facility. Whereas a year ago supervised injection was a fringe topic for harm reduction agencies, it is now an agenda item for city councils and state legislatures. SIF advocates would do well to learn from previous harm reduction efforts, particularly syringe exchange. In the early 80’s, syringe exchange was illegal. Many thought it a radical, even dangerous idea. However, an epidemic—this time, HIV/AIDS—prompted radical (albeit belated and variegated) changes to laws and practices around the country.

The harm reduction field has, in the last twenty years, undertaken several similar advocacy efforts that met with success. Studying the establishment of syringe exchanges and naloxone access programs may enlighten the movement toward supervised injection. Both of these were edgy forms of harm reduction in their infancies, but today have become relatively well-accepted public health measures.

The route of needle exchange, or syringe access, to “legitimacy” has been fraught with uncertainty and backtracking. Even today, “legitimacy” is a relative term—there remain no needle exchanges in seventeen states (Kaiser Family Foundation, 2014).

Many groups still oppose needle exchange. They include law enforcement, district attorneys, and community organizations. In 2006, public health expert Dr. Barbara Tempalski characterized the local disagreements over needle exchange as emblematic of a national “struggle… between law enforcement and medical providers as to whether drug users should be defined as criminals or medical patients” (Kubi, 2012).

In Denver, attempts to sanction syringe exchange statewide started in 1997 but the bill failed. The city of Denver, in anticipation of statewide approval, actually authorized needle exchange. Colorado Organizations Regarding AIDS (CORA) tried to revive the bill but it took until the fall of 2009, immediately prior to the supportive then-governor Ritter’s departure, that supporters made a final push to pass their bill. In the spring of 2010, CORA’s lobbyist worked with the progressive Mendes-Steadman lobbying firm. Eighty-one of one hundred senators voted for it, and the bill was passed on May 26th 2010.

Meanwhile, at the city level, Denver had on the books the previously-mentioned ordinance authorizing syringe exchange. In parallel with statewide efforts, the Denver Drug Strategy Commission decided that
syringe exchange was a priority for Denver. An aide in then-mayor Hickenlooper’s office, Karla Maraccini, helped push forward more progressive local ordinances as well as statewide legislation. Even after the state bill was passed, syringe exchange took 21 months to implement because of political necessities. Overly restrictive policies and zoning laws meant that, while HRAC eventually received city council approval, they had to move prior to the onset of syringe exchange activities.

The journey to naloxone access has been only slightly less troubled. Naloxone has an impressive therapeutic profile. The drug has few medical side effects and it is highly effective in reversing overdoses. There is anecdotal evidence that easy naloxone access can help reduce overdose deaths. However, increasing access to naloxone was not always recognized as a beneficial overdose reduction strategy; it took fifteen years to recognize that community-based naloxone distribution was a cost-effective, unobjectionable practice.

Until at least 2008, prominent public health officials actively opposed naloxone distribution to laypersons. "I don’t agree with giving an opioid antidote to non-medical professionals. That's No. 1," said Dr. Bertha Madras, deputy director of the White House Office on National Drug Control Policy. "I just don't think that's good public health policy." (Knox 2008) Other objections were based on concerns that easy access would prevent people from ceasing drug use. “You give them the Narcan, where is their motivation to change?” said Baltimore County’s longtime substance abuse director Michael Gimbel (Smith 2007). PWID themselves also had concerns about naloxone access. Specifically, 35% of heroin users worried that people might inject more heroin knowing that an overdose reversal agent was nearby, while 62% stated that they would be disinclined to call 911 after an overdose if they had access to naloxone. (Seal et al, 2003) After naloxone access was expanded, both these concerns were shown to be invalid (Levine et al 2016, Maxwell 2005, Seal 2005, Wagner 2010).

Fortunately, underground harm reduction efforts to promote naloxone have now given way to federally-endorsed guidelines promoting naloxone. Many efforts, bipartisan, focus on expanding naloxone access beyond its original scope. Naloxone access for emergency medical services, fire, and police (Davis 2014) is now endorsed by the National Drug Control Strategy (White House, 2013). In parallel, the trend of prescribing naloxone to PWID has expanded to prescribing to friends and family members (Goodman and Gilman 2001, Wheeler et al 2012) and, finally, to standing orders allowing anyone to access naloxone through a pharmacy (Wheeler 2015).

In Denver, “naloxone was a lot easier” than syringe exchange, says Lisa Raville, executive director of the state’s largest harm reduction organization. For many years, the Harm Reduction Action Center tried to find a physician to prescribe naloxone. In 2011, HRAC leaders met a physician at a fundraiser and she began prescribing naloxone for HRAC clients in May 2012. However, most of naloxone was used on third parties, since it is difficult for an overdosing person to self-administer naloxone. Dr. Kennedy worried that this opened her to liability and the furor of the medical board.

This led to Senate Bill 14 authorizing prescription of third-party naloxone. Dr. Kennedy’s relationship with a physician colleague, state senator Irene Aguilar, M.D., enabled Dr. Aguilar to co-sponsor this bill. However, even with this added measure, many individuals could not access naloxone. Finally, a bill permitting standing orders for naloxone was ratified May 2015 by a nearly unanimous vote.

Ms. Raville cites the importance of networking and realizing a window of opportunity in these policy efforts. Several of these advocates in key positions—Dr. Kennedy as a health care provider and Ms.
Marracini as a city government advocate—happened fortuitously. This highlights the importance of chance and the need to emphasize connections in lobbying and advocacy. The legislature and electorate in Colorado and are also fairly open-minded and amenable to harm reduction activities, as evidenced by HRAC’s seven legislative wins in seven years. Finally, data regarding the safety and efficacy of these interventions were necessary and helped clinch support for the bills (L. Raville, personal communication, June 2, 2016).

There is little doubt that sanctioned supervised injection would require legal changes. As outlined above, supervised injection violates two major federal statutes—the Controlled Substances Act and “crack house” statutes. While these are unlikely to change anytime soon, any supervised injection facility (and its employees) would require state exemptions from these laws in order to operate with any level of stability.

That it takes an epidemic to change perceptions and laws across the United States is unfortunate, but it is unlikely to change soon. There are, however, reasons to believe that supervised injection can occur more rapidly than other social change in the past, and perhaps even more quickly than needle exchange and naloxone access have happened.

In the legislative arena, many harm reduction organizations are experts in lobbying. Most of these organizations helped push through their state’s syringe exchange laws and, very recently, naloxone access provisions; since 2001, 46 states have passed at least one law allowing more access to naloxone by laypeople. (Network for Public Health Law 2016) Clearly, harm reduction organizations and other advocates for drug users are savvy veterans of the legislative process. Some have reliable champions in state legislatures. Furthermore, there are two national organizations, the Harm Reduction Coalition and the Drug Policy Alliance, that assist state efforts. Supervised injection is likely to have many of the same backers as previous proposals, so lining up support for this controversial effort may be less difficult than a novel legislative effort.

In addition, there are already places that violate federal law where Coloradoans can use drugs. Since legalization of marijuana in 2014, private clubs created expressly for using marijuana have existed without interference from local or federal authorities. While inhaling marijuana does not approximate the risk of injecting heroin, marijuana purchase and use is illegal under federal law and thus subject to the same two statutes mentioned above. This sets a precedent of sorts for supervised injection, particularly given the potential health benefits of the latter (Anleu 2015).

Furthermore, supervised injection is not explicitly prohibited by state laws. As stated above, the primary legislative barriers to supervised injection are federal. Therefore, establishing a SIF should not require repeal of any bans at the state level. This could make legislators more likely to support such a bill because it will not flout any existing state laws. In fact, the few movements toward supervised injection have raised the possibility of circumventing the legislative system and utilizing local public health emergency functions to authorize supervised injection.

While it does not relate directly to legislation, supervised injection is also not explicitly ineligible for federal funding. While the federal government was expressly banned from funding needle exchange for over 20 years under Reagan-era drug laws, supervised injection sites may be immediately eligible for funding.
Legislatively, Colorado has proven particularly progressive on drug policy. Colorado is one of only five states to meet all the criteria for ideal naloxone access. The state also recently expanded its Good Samaritan laws to exempt people from arrest if they call 911 in case of an overdose. And of course, Colorado was one of the first two states to legalize marijuana for recreational use after leading the way in medical marijuana.

While law enforcement may never support supervised injection wholeheartedly, it is more acceptable now than ever before. Federally, the country is no longer in the throes of the War on Drugs. In fact, recent executive and federal legislative actions give hope that the government is following the populace in accepting a medical view of drug use. President Obama has made numerous changes to drug policy to address the opioid crisis, including expanding access to treatment, improving mental health insurance coverage, and approving federal funding for syringe exchanges. Very few of these changes have involved enforcement of existing laws against street-level drug users or increasing penalties for drug use (White House 2016).

Medically, syringe exchange has been shown to be effective at reducing the spread of HIV and hepatitis. Health care workers may be more likely to support supervised injection, hoping that SIFs prove themselves effective just as syringe exchanges have. There is reason to believe that this might be the case, since one of the primary goals of supervised injection—decreased overdose—is easy to achieve if naloxone is given in time.

Public acceptance of supervised injection is also on the rise. As I found in my interviews, many residents of a gentrifying city often approve of efforts to move public nuisances out of the public eye. Many of them are simultaneously aware of the need to provide social services to all citizens. Supervised injection may be seen as a progressive, mutually beneficial solution to the problem of public injection. Furthermore, far more people perceive that they are personally affected by the current crisis due to the wide cross-section of the country affected by opioids.

This perception is influenced both by facts as well as media portrayals. Of a large sample of people entering treatment for heroin addiction, only about half of the people who tried heroin prior to 1980 were white. But of people entering treatment in the past decade, 90% of the people who tried heroin for the first time were white. While highlighting this disparity is not universally popular, the media have undoubtedly pushed injection and overdose into the public eye (Cohen 2015).

Socially, harm reduction activities have become far more voguish in the current opioid crisis. This is probably attributable to improved understanding of the nature of drug use and addiction as well as the changing demographics of the current epidemic. Medical professionals and the lay public also demonstrate improved knowledge and acceptance of addiction as a medical disease (Wood et al, 2013).

Future studies of this topic in Denver should assess the details of SIF operation, including hours, operating procedures, and staffing requirements. They can also refine the statistical validity of the demographics of SIF users and expand into other groups of PWID, including those with stable housing and the severely mentally ill. These groups comprise a significant portion of PWID and were undersampled in this survey. Furthermore, future studies should investigate whether groups at highest risk for disease transmission and overdose—those who have HIV, Hepatitis C, or a history of overdoses—are more likely to use a supervised injection facility.
Drawing on exploratory studies from Ottawa and Toronto can provide future direction for SIF efforts in Denver. “Stakeholders stressed that an implementation plan should include an assessment of the existing scientific evidence for supervised consumption facilities, consideration of the generalizability of this evidence to local circumstances, a clear explanation of the facility’s goals, community consultations, and a service model design that addresses the unique social and political environments of each city” (Bayoumi and Strike, 2012).

However, Denver has its own unique aspects that make it different from cities where SIFs exist already. This is highlighted by the contrast in cost-effectiveness findings between Denver and Vancouver. Pinkerton (2010) found that Insite prevents 83.5 HIV infections a year, but a careful reading of the study shows that the supervised injection part of Insite prevents a mere 2.8 infections per year, with the rest coming from other services like needle exchange. This finding is about an order of magnitude higher than my finding that, even with very liberal estimates, less than one HIV infection would be prevented in Denver each year.

Hepatitis C is a different story, however. The higher prevalence of hepatitis C make it likely that a SIF may be both cost-effective and cost-saving due to prevention of hepatitis C alone. This again contrasts with findings from other studies that suggest SIFs are not cost-effective through prevention of hepatitis C. This may relate to the disease prevalence in the two locations; Denver’s hepatitis C prevalence is in the range of 60%, while it is virtually endemic in Vancouver PWID at over 80%.

Several other studies of potential Canadian SIFs and Insite use mathematical modeling to show that secondary effects like a reduction in syringe sharing can make a SIF cost-effective. In some of these cases, retrospective data are available but not used. For instance, data for HIV and hepatitis C infection are available from pre- and post-Insite eras, but the authors still utilize modeling techniques. (Andresen and Boyd, 2008) Furthermore, these modelling techniques do not reflect reality. They assume that more SIFs would increase utilization of SIFs to the point where very few people are injecting outside of SIFs, which does not correspond with the finding that only half of eligible PWID in the neighborhood of Insite have ever used the facility.

While studies of potential SIF users in Toronto and Ottawa reveal that potential SIF users engage in some riskier behaviors, such as passing needles, they also show that the SIF might not reach some target populations, like marginally housed people and newly initiated injectors. The only significant differences in these studies were that likely SIF clients were more likely (Public Health Agency of Canada, 2006 and Leonard, DeRubeis, and Strike 2008) to be homeless or to inject in public. While these are promising findings, they by no means demonstrate that potential SIF users are extremely high-risk injectors. If this is true, then perhaps supervised injection fails to reach the target population, a primary litmus test of public health interventions (Kass 2001). Overall, my cost-effectiveness analysis as well as a review of the literature suggest that cost-effectiveness and cost savings from a SIF are by no means guaranteed.

This paper includes an exhaustive study of the scientific evidence for supervised injection; as highlighted previously, these data are limited by the fact that they have been largely collected from Sydney and Vancouver. Thus, the generalizability of the scientific evidence to the USA, where drug policy is still largely focused on abstinence and punishment, is uncertain. The facility goals must take into consideration primarily the health benefits and human rights of PWID. However, the goals also have to take into account urban attractiveness and property value concerns of urban residents. Local social
service providers, law enforcement, legislators, and community members all must agree on a SIF for it to be sustainable.

Limitations

The study was limited by a small sample size. However, as an exploratory study, it was not intended to have the power to detect small differences in survey-takers’ opinions. I was limited by time and resources to the number of the surveys administered.

The survey was also limited by selection bias. Using a convenience sample from the Harm Reduction Action Center significantly improved confidentiality and recruitment efforts, but at the expense of diverse opinions. It is very likely that the clients I interviewed tend toward heavier use than the average PWID, and respondents were almost certainly different in their health behaviors than PWID who do not patronize syringe exchange. However, the nature, direction, and magnitude of these differences are unknown.

It is likely that my sample neglected severely mentally ill and extremely marginalized persons. While PWID are certainly a marginalized group, participation in the intake enrollment and drop-in require that participants maintain a measure of decorum. Furthermore, participation in the interview required that participants remain awake and attentive for thirty to forty minutes. This was a significant barrier to participation for some HRAC clients.

Therefore, it is likely that I undersampled people with extremely problematic drug habits and severe mental illness. This population could potentially benefit from supervised injection, as those with severe mental illnesses often engage in the most risky injection behaviors (Mackesy-Amiot 2014); supervised injection facilities could also help engage marginalized PWID in social services, harm reduction, mental health, or substance abuse treatment efforts.

It is also very likely that I undersampled PWID with housing. The omission of this question, while well-intentioned to help avoid the stigmatization of discussing homelessness, was significant. Since I tended to ask people who were seated at HRAC to participate in the interview, I was less likely to sample people with stable housing. Often, clients who are stably housed simply enter, exchange, and leave, spending less time at the drop-in than clients who are homeless or unstable in their housing. Furthermore, clients with cars have nowhere to park and often rush out to avoid a ticket; therefore, my survey probably captured fewer people with cars as well as housing.

Having a better estimate of the prevalence of syringe sharing would have increased the accuracy of cost-effectiveness and cost-benefit analyses for hepatitis C and HIV. While some data are available in the literature, the availability of sterile syringes varies widely between cities. I was able to make a wide ad hoc estimate of sharing prevalence, but having more estimates could have narrowed this range and, potentially, changed the findings in these analyses.

For community stakeholders, I was limited by the unwillingness of law enforcement to participate in the study. Business owners and health care professionals, who have less hierarchical supervisory structures, were relatively easy to recruit. City government officials were also ready participants. However, law enforcement proved very difficult to contact. Several cited the permissions involved as barriers to participation. It is possible that the illegal nature of injection drug use dissuaded law enforcement officers from participating. Recognizing this, I highlighted the confidential nature of the research,
unsigned consent, and Certificate of Confidentiality in my introductory emails. Reaching more law enforcement officers could have better elucidated this key group’s beliefs on supervised injection.

It is also possible that the relatively small financial incentive, lunch, prevented some community stakeholders from participating. While $10 was a large incentive for HRAC clients, this amount was trivial for others, especially business owners who may have lost business during the interview.

Cost-effectiveness analysis may not be an effective method for a pilot study of supervised injection. CEA entails, necessarily, several assumptions that will remain unknown until well into a SIF’s lifespan, if ever. Even Health Canada, which oversees the operation of Insite through the Vancouver Coastal Health Authority, states that “the EAC (Expert Advisory Committee) were not convinced that these assumptions were entirely valid” regarding the mathematical modelling studies and they do not give much weight to them.

There is an additional aspect to the cost-effectiveness study that I was unable to complete. Perhaps the most financially draining aspect of injection drug use is not bloodborne disease or overdose but skin and soft tissue infections (SSTI). A recent study of a single county hospital in Florida suggested that injection-related SSTIs cost nearly $1 million a month, with 17 deaths over the year of the study (Tookes 2015).

Many believe that a SIF could prevent SSTI far more effectively than either HIV or hepatitis C because these SSTI usually result from careless and hurried injections. SIFs allow PWID to take the time to prepare injections properly and, in theory, have the potential to reduce these infections significantly. However, there are no data about the specific likelihoods of SSTI, the reduction of SSTI through better practices, or the probabilities of mortality from SSTI. Therefore, a cost-effectiveness study on SSTI would be a shot in the dark compared to other conditions for which better data exist.

Finally, the authors of several cost-effectiveness studies in Vancouver acknowledge that “the largest obstacle to implementing a SIF in Ottawa is strong opposition from the local municipal government and police force as well as the federal government.” In the face of such resistance, even robust cost-effectiveness data would be peripheral at best to a successful argument for a SIF. Another key difference in America is the diffuse nature of payment for health care services and other community resources. Cost-benefit analysis is far more relevant in Canada, where a single entity pays for both preventative and therapeutic health outlays. In America, prevention is rarely covered by the same entity as medical treatment. Thus the construct of cost-effectiveness may be less valid than other models for analyzing and advocating for a SIF. This is another key difference that should be respected as Denver moves toward establishing a SIF.

V. Conclusion

The road to supervised injection cannot be constructed by a single entity. In every instance where a supervised injection facility has been established, there has been a long period of discussion and negotiation between various stakeholder groups to establish expectations and set regulations. While this negotiation will necessarily involve government organizations—particularly in health care, legislation, and law enforcement—there is an increasing recognition that “cooperation between governmental and non-governmental agencies” has resulted in a “blurring of the boundaries between the public and private sector” (Kubler and Walti, 2001).
Cities and states are often at the forefront of progress on drug policy. Federal governments in North America and Western Europe legislate drug regulations, but cities and states carry out most of the law enforcement and health care for drug-related problems. However, both these domains require financial resources. Thus, the will to change drug policies within cities and states is often determined by the financial status of the city (Kubler and Walti, 2001). Note that this works both ways; pathways to liberalization of drug laws have also been prompted by the increased revenue associated with the creation of legal drug marketplaces.

Regarding the establishment of a SIF, Denver would seem a logical place for such a progressive drug policy. Kubler and Walti, in their discussion of the “attractiveness policy” of the gentrified post-industrial city, posit that "the presence of the socially marginalized functions as a negative externality…. If the gentrified city is to function properly, socially marginalized individuals, and social problems in general, should not be seen.” At the same time, though, liberal social policy requires that cities offer a generous welfare policy.

Denver most definitely meets the criteria for what Neil Smith (1996) called the “revanchist” city, where the middle and ruling classes mobilize “against the supposed ‘theft’ of the city, a desperate defense of a challenged phalanx of privileges, cloaked in the populist language of civic morality, family values and neighborhood security.” Recent large-scale evictions of homeless people from public spaces indicate that Denver is at a tipping point in its struggle to define its balance of attractiveness versus social welfare. Kubler and Walti posit that this struggle is twofold.

There is a direct conflict between socially marginalized people and the populations of gentrified neighborhoods. There is also a hidden conflict between nongovernmental actors and city/state agencies, primarily law enforcement. This conflict frequently involves redundant and even counterproductive efforts, especially in harm reduction; for instance, syringe access programs distribute needles that may lead to searches, charges, and possibly incarceration, causing nonprofit legal services to expend time assisting clients with drug charges and creating a cycle.

In areas with more successful drug policies, city governments have fostered coordination schemes that “started a collective learning process, during which the various actors mutually adjusted their practices in order to reduce the counterproductive effects of formerly uncoordinated activities.” This has the potential to shape a more efficient Nash equilibrium where nonprofits and government actors minimize their counterproductive efforts. Adopting a social public-order regime, rather than a zero-tolerance policy, toward public disturbances may prevent “potentially conflictual situations by acting simultaneously on the urban behavior of deviant individuals as well as on neighborhood attitudes.”

Denver also already has the organizational infrastructure in place to handle a supervised injection facility. As with many European cities that successfully deal with drugs, Denver has both the Denver Office of Drug Strategy and the Drug Strategy Commission. The former is the mayoral office charged with development of drug strategy and the latter is a broad-based community coalition.

Kubler and Walti outline three principles that seem to be requisite for successful drug policies in a dozen European cities. First, policymaking takes place at all levels of operation in the local government structures. Second, efforts engage representatives of the police and social services. Third, none of the commissions and committees have formal decision-making power. The Denver Drug Strategy Commission meets this description, but its utility varies depending on the mayoral regime in power.
More importantly than any of the above, Denver has demonstrated its willingness to be at the forefront of harm reduction drug policy.

As public health workers in Denver move toward a SIF, it is important to recognize that harm reduction efforts “meet people where they’re at.” This usually regards clients, but it is equally useful to analyze political and social support in this way. Just as some needle exchanges may operate under a handshake agreement—Boulder, Colorado did just that for 22 years (Miller 2011)—supervised injection will probably exist in a gray area prior to outright acceptance and propagation.

However, it is also important to move supervised injection along apace, because the spotlight on opioid addiction and harm reduction will not last. Kingdon’s “Policy Windows of Opportunity” model states that policy windows occur when there is a well-defined problem, a possible solution, and the political will to act. Supervised injection actually addresses two major problems simultaneously. SIF can decrease overdose and public injection. Framing supervised injection as a dual solution to these problems has the potential to create more political will than a single problem; furthermore, these two arguments may sway entirely different types of stakeholders.

**Dual windows of opportunity**

![Diagram showing dual windows of opportunity]

This analysis in terms of Kingdon’s model shows that there are two desirable goals for supervised injection. While some statements about supervised injection reflect the belief that it will be a panacea for injection-related problems both in PWID and society at large, it is far more helpful to have a narrow
goal and Kingdon’s model suggests that this goal is twofold: decrease public injection and decrease overdose.

**Recommendations**

Partnering: Operating even a small SIF would require hiring medical professionals, significant risk assessments and new facilities. These functions are beyond the current capacity of HRAC. Furthermore, community support for a SIF would benefit greatly from direct buy-in from partners. Particularly, health care professionals, academic research, treatment providers, and city agencies like the Denver Drug Strategy Commission would be important to enlist as partners.

The most notable and best-studied SIF in the world, Insite, survives in part due to its groundbreaking research on SIFs. Having a world-class academic research institute nearby provides an obvious partner for a prospective SIF as it helps to create its own evidence base. Having health care professional and treatment providers on board prior to establishment of the SIF will not only legitimize the advocacy for the SIF but also provide a pool of willing professionals who might develop policy for the establishment or even staff the SIF. Finally, very few SIFs exist without close involvement with city agencies; most of these in Europe include a local drug policy board. In Denver, the analogous bureau would be the Denver Drug Strategy Commission.

Another group that stands to benefit greatly from a SIF is downtown business owners. They shoulder a disproportionate burden of drug injection. Most businesses are not prepared to deal with infectious litter and unruly individuals. Occupied bathrooms frustrate paying clients. Thus it would be beneficial to cultivate relationships with business owners who can help advocate for a SIF.

Preparing: Many people will determine their support for a potential SIF based not on facts from prior efforts but on their beliefs and morals. In the absence of definitive information on SIF policies, organizations that do not support harm reduction activities may introduce baseless or biased information into this void. Therefore, ensuring that key SIF policies are formulated well prior to the onset of advocacy is important.

For instance, I found in my survey of community stakeholders that many would compromise on their misgivings about a SIF if it helped people enter drug treatment. Therefore, ensuring that the facility could have onsite or easily accessible, seamless treatment would be ideal. Preferably, clients could start medication-assisted treatment on demand.

Other policies would probably require compromise, especially at the official level. The sharing or splitting of drugs onsite is highly controversial at other SIFs and the controversy over this would best be avoided for this fledgling effort. Therefore, it might be best to state, at least at the onset, that clients will not be able to split drug in the facility. This could head off premature accusations of on-site dealing. While not all details need to be decided so far in advance, certain key, hot-button policies should be set prior to any publicity so that potential objections can be averted.

Framing: With many parties interested in drug policy, some of them quite new to the scene, SIF advocacy efforts must ensure that they are in a position to respond to a variety of arguments and appeal to as many groups as possible. Anticipating objections to a SIF and tailoring messages to those groups that may be undecided about their support for a SIF could give advocates the first-mover advantage while opponents regroup.
This first-mover advantage is particularly true in this instance because, to draw from marketing, this is an entirely new market segment. Many people have not even heard of supervised injection and have not formulated any opinions on it. Therefore, an effective initial message targeted at key stakeholders could convert potential opponents into supporters.

Timing: As HRAC and its community partners move toward establishing a SIF, there is a trade-off between acting sooner and later. If the announcement comes too soon, the effort is open to political blowback and loses the element of surprise. However, a delayed announcement risks missing the aforementioned window of opportunity. It is important to line up support for this effort soon and have talking points at the ready. A high-profile overdose or other drug-related event could galvanize support for this effort, similar to recent celebrity deaths that resulted in media saturation, most of it supportive of drug treatment. To capitalize on this momentum, SIF advocates should prepare a community forum to introduce alternatives to public injection.

References


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Service Learning/Capstone Experience Reflection
The Harm Reduction Action Center is Colorado’s largest public health agency that deals with injection drug use. It is the leading syringe access program in the state, providing advocacy for people who inject drugs and leadership for municipal health departments and other harm reduction agencies from around the state.

The center is located across from the capitol building in Denver in close proximity to open drug markets and common sites for public injection. The staff comprises five full-time employees and one part-time health educator. In addition to providing syringe access, the center functions as a morning drop-in center for homeless and marginally housed clients.

During my time at HRAC, I performed myriad functions from humble bathroom cleaner to consultant facilitating the strategic plan. This all started with the humblest of functions: bathroom attendant. When I started at HRAC, they had two bathrooms and they were often misused. The newest volunteer or intern usually takes turns supervising the bathroom to ensure that no one is spending too long in the bathroom, because this has resulted in on-site overdoses before.

Through this humble position, I came into contact with many of the clients and spent a lot of time in the hallway chatting with them. After a change in the structure of the bathrooms, I earned a position at the table, exchanging syringes with clients for several weeks. From there, I moved into assessing clients’ wounds and referring them for treatment as needed; developing health information pamphlets for clients; training staff on assessment of common skin conditions; and representing our organization at community meetings. I gradually gained the trust of staff and clients and was rewarded with responsibility accordingly.

Finally, I started doing my own research project after IRB approval. I found the experiences with direct client service invaluable, as I already knew some of the research subjects. I would have had far more difficulty enrolling clients and community stakeholders alike had it not been for their familiarity and trust. The trust of staff was also imperative as I enrolled subjects, since the staff members often helped with referrals for clients and community stakeholders.

In addition to my research project, which will provide HRAC with most of their SIF advocacy materials over the next few years, my largest contribution was the facilitation of the strategic plan. I was extremely pleased that they asked me to facilitate this, because I hoped to get experience strategic planning. This plan will have a lasting effect on the organization. It also taught me a lot about working with groups, leadership, and creativity. I felt like I brought a lot of enthusiasm and an outsiders’ perspective to this effort in addition to instrumental knowledge about how to formulate a strategic plan. This project has benefitted me by allowing me to network with nonprofit leaders and present a tangible deliverable to prospective employers.

The biggest challenges of my capstone experience occurred very early and very late during the year. At first, I was given so little responsibility—I felt like I got overruled even during my bathroom supervision—that I got frustrated and thought about finding another service learning site. However, I see now that there are large disparities in enthusiasm and preparedness for interns. Everyone starts out with menial duties and they earn more responsibility. I now expect this to be the case with my career. Even with graduate degrees and an impressive resume, I will have to prove myself in my work.
Later in the year, I had a great challenge facilitating the strategic plan. As long as I was doing the work, it proceeded pretty rapidly. However, in the interests of finishing my capstone project, gaining input from others on the strategic plan, and involving board members, I delegated goal formation to the staff and board. In the long run, I hope that this collaboration will create buy-in for the plan and lead to future board-staff collaboration, but in the short run, the extreme delays (it has been about two months since I delivered the nearly finished plan to the groups) have been difficult and at times I have wanted to take over the goal formulation myself.

However, I think both of these difficulties have the common effect of showing me the virtue of patience and teamwork. Theses virtues were not nearly as emphasized in medical school, where rapidity and independence were essential. I think these virtues are transferable into nearly any field, but public health in particular emphasizes the multidisciplinary aspect.

Another important insight from this project regards the nature of nonprofits, government, and corporations in America. There is a tendency of nonprofits and corporations to provide some services that were previously provided by governments. Along with this comes some duplication of efforts and even counterproductivity. For instance, the Harm Reduction Action Center advocated for a bill that makes it legal to carry new and used syringes. However, law enforcement continue to confiscate PWID’s syringes. This wastes both resources at the nonprofit as well as time for law enforcement. Simply reducing the counterproductive efforts between organizations and the government could result in less antagonistic relationships as well as better resource management.

My view of public health practice has changed in line with this last insight. I see the necessity of engaging a variety of stakeholders to solve public health problems. For instance, at HRAC, very little could happen without legislative action, which requires both government and for-profit (i.e. lobbying) efforts. HRAC also purchases syringes from for-profit corporations via a nonprofit buying collective. This variegation of the actors in the public health realm allows for creative solutions and partnerships; however, it also results in significant duplication of efforts and inefficiencies. I will be more aware of the difficulties of working in public health as a result of this effort.

In conclusion, working with an extremely marginalized population in a nonprofit setting has reaffirmed my career goal of improving access to and function of the American health care system.
## Application of Public Health Competencies

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<tr>
<th>Core/Cross-Cutting Domains</th>
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<sup>1</sup> Competency, Activity/Application

<sup>2</sup> Reflection of Competency Strength/ Professional Growth

<sup>3</sup> Committee Assessment
### Competency 6.C. Communicate accurate public health information with professional and lay audiences

**Activity/Application:** Colorado Rx Consortium; development of information pamphlets for clients

**Reflection:** I represented HRAC on the Colorado Rx Consortium’s data and research workgroup, working with professional researchers to present my research and critique theirs. This reminded me that often several versions of a project may be needed to satisfy disparate stakeholders’ viewpoints or levels of readiness to change.

We also worked with a board member who does professional marketing campaigns. He helped us identify and tailor our messages to specific demographic groups that might be amenable to supporting HRAC.

Finally, I developed informational pamphlets on health conditions common in PWID. I had to word these to be technically correct but also comprehensible by clients with low absolute and health-related literacy.

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### Competency 8.A. Identify linkages with key stakeholders

**Activity/Application:** Strategic planning

**Reflection:** Throughout my capstone project, I communicated with a disparate group of community leaders with varying levels of support for our mission. I also facilitated a revamp of the way we cultivate partnerships through our strategic plan.

Also through the strategic plan, I helped our organization re-emphasize the value we place on client participation through both volunteerism and strategic guidance. I revitalized our client advisory board and led this for the last six months.

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### Overall Assessment of Core/Cross-Cutting Domains (completed by Committee Chair with input from Committee Members)

Comments regarding student’s progress and professional growth in the above core competency areas, including current strengths/weaknesses: JK has the competency of identifying different involved stakeholder groups, and communicating accurate public health information with various levels including healthcare providers, community leaders as well as lay audiences.
<table>
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<tr>
<th>Competency, Activity/Application&lt;sup&gt;1,2&lt;/sup&gt;</th>
<th>Reflection of Competency Strength/ Professional Growth&lt;sup&gt;3&lt;/sup&gt;</th>
<th>Committee Assessment</th>
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<tr>
<td><strong>Core/Cross-Cutting Domains</strong></td>
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<tr>
<td><strong>Competency 8.B. Identify different levels of community engagement and participation</strong></td>
<td>Reflection: Respondents to the survey often cited conflicting priorities in their different identities: work, family, personal, professional. For instance, I had a survey respondent who gave three answers to a question: as a father, as a small business owner, and as a pharmacist. This gave me insight into people’s willingness or unwillingness to support harm reduction. I also led a revitalization of our PWID advisory board. This consisted of leading discussions about the service provided by HRAC. It reminded me that public health organizations serve their clients and that it is vital to involve them in service and planning efforts.</td>
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<td><strong>Activity/Application: Qualitative survey analysis, advisory board</strong></td>
<td>Reflection: I read several ethnographic analyses of injection drug use prior to starting my project and realized that this particular project, and public health in general, is inextricable from the subjects therein. I often related my own stories of medical practice and with research subjects as we conversed. However, I also remember the strict confidentiality rules that governed my work at HRAC and on my capstone, upholding them above all, even when survey respondents wanted to waive such protections. I also reaffirmed my desire to make public health practice part of my career working to improve the health care of underserved Americans.</td>
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<tr>
<td><strong>Competency 10.B. Articulate how ethical principles apply to public health practice</strong></td>
<td>Reflection: I read several ethnographic analyses of injection drug use prior to starting my project and realized that this particular project, and public health in general, is inextricable from the subjects therein. I often related my own stories of medical practice and with research subjects as we conversed. However, I also remember the strict confidentiality rules that governed my work at HRAC and on my capstone, upholding them above all, even when survey respondents wanted to waive such protections. I also reaffirmed my desire to make public health practice part of my career working to improve the health care of underserved Americans.</td>
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**Concentration Domains**

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<th>Competency, Activity/Application</th>
<th>Reflection of Competency Strength/ Professional Growth</th>
<th>Committee Assessment</th>
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<tr>
<td>1.A. Demonstrate knowledge of public health policy formulation and implementation strategies</td>
<td>Reflection: Internally, I facilitated our strategic plan, requiring extensive work to formulate metrics and implement changes within our organization. Externally, I have started networking with the power brokers in Denver to build knowledge about and support for supervised injection facilities. I utilized my knowledge of several public health frameworks to develop recommendations for my Capstone project, including Bronfenbrenner’s Ecological Framework for Human Development and Kass’ Ethics Framework for Public Health. These help me structure what otherwise was an incredibly unstructured project.</td>
<td>![Image]</td>
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<tr>
<td>Developing advocacy materials and strategic planning within HRAC, discussion and recommendations for capstone project</td>
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<tr>
<td>1.B. Collect, analyze, and synthesize information about health policy problems and issues.</td>
<td>Reflection: The preparation of my IRB application required extensive collection of research and background information regarding supervised injection. In my write-up, I was required to develop future research directions on supervised injection. I also communicated directly with several of the authors I cited and other people working in harm reduction to understand more fully the barriers to supervised injection.</td>
<td>![Image]</td>
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<td>Application and TB preparation</td>
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**Assessment of Concentration Competencies (completed by Committee Chair with input from Committee Members)**

Comments regarding student’s progress and professional growth in the above concentration competency areas, including current strengths/weaknesses:

JK was successful in public health policy formulation and implementation strategies as well as collection and analysis of relevant information. He is very competent in synthesizing the information into understandable format that helps him to communicate effectively with various stakeholder groups.

**Concentration Domains**

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<tr>
<td>1.C. Develop alternative policy options for specific public health issues and assess their economic, political, legal, and social implications</td>
<td>Reflection: This competency was achieved par excellence. I analyzed supervised injection from economic, political, legal, and social viewpoints. During my economic analysis, I realized that supervised injection is, unfortunately, unlikely to be highly cost-saving and perhaps not even cost-effective. However, I also recognized that cost is not the primary barrier to supervised injection. Therefore, our efforts to develop a SIF will appeal more to urban quality of living, human rights, and welfare concerns.</td>
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<tr>
<td>Capstone analysis, discussion and conclusions</td>
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<tr>
<td>2.A. Evaluate the effectiveness of public health policy using formal methods of policy analysis and program evaluation</td>
<td>Reflection: As seen in the prior competency, I utilized formal economic analysis including cost-effectiveness and cost-benefit analyses to evaluate supervised injection. I also ensured the validity of my survey findings by utilizing previously validated questions from similar research projects.</td>
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<tr>
<td>Research project: surveys and semi-structured interviews</td>
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**Assessment of Concentration Competencies (completed by Committee Chair with input from Committee Members)**

Comments regarding student’s progress and professional growth in the above concentration competency areas, including current strengths/weaknesses:
Acknowledgements

This capstone and service learning project would not have been possible without the gracious assistance of so many. Thank you to all the instructors and administrators at UNMC for helping me along these last five years! More than anyone, I thank my capstone committee faculty members, Rebecca Anderson, J.D., M.S., C.G.C and Nizar Wehbi, M.D., M.P.H., M.B.A. for their invaluable and timely assistance.

Thank you to Christine Dumont-Heinrich, M.P.H., who made the fortuitous connection to Chris Bui, J.D., M.P.H., who arranged my meeting with Lisa Raville, HRAC executive director. Many thanks to the staff and board at HRAC who assisted me so many times over the past year and helped critique this effort. Thanks to the Colorado Rx Consortium, particularly the data and research workgroup, and even more specifically to the Opioid Research Consortium for allowing me to vet my survey and results. Thanks to Emilia Volz, M.P.H. and Robyn Briggs, HRAC interns and volunteers who assisted with this project and others. Special thanks to Alia Al-Tayyib, Ph.D. for sharing her data and expertise. Jeremiah Lindemann assisted with the maps and provided me with access to his software.

Finally, I want to acknowledge those lost to overdose and their family members, as well as those still using drugs, that they might find their own serenity. As a community, we have made progress toward better understanding of drug use but we still have a long way to go to alleviate the largely preventable consequences of addiction.

Appendix A—Client Survey.
This was the survey for HRAC clients. For community stakeholders, only section 2 questions were asked.

Age:
Gender:
DOC:
Intersection near where you spend the most time (house, camp, park, shelter)
(All questions, if not otherwise noted, apply to the last six months)

1.1 What drugs have you injected in the past six months (Choose all that apply)?
   Cocaine  Heroin  Rx opioids  Other Rx drugs  Methamphetamine  Speedballs  Goofballs
1.2 What drug have you injected most frequently?
   Cocaine  Heroin  Rx opioids  Other Rx drugs  Methamphetamine  Speedballs  Goofballs
1.3 Have you been diagnosed with HIV or AIDS?
   Yes  Maybe/don’t know/choose not to answer  No
1.4 Have you been diagnosed with hepatitis C?
   Yes  Maybe/don’t know/choose not to answer  No
1.5 How many times have you overdosed in the past six months?
   Never  Once  Twice  Three or more times
1.6 How often do you inject?
   I currently do not inject  Less than weekly  About once a week  A few times a week  Daily
   1-3 times daily  3+ times daily
1.7 How often do you inject?
   Always  Usually  Sometimes  Never
1.8 When you inject in groups, how large are those groups?
   2 (just me and another person)  It varies  Usually large groups of 4 or more people
1.9 How often do you reuse your own injection equipment?
   Always  Usually  Sometimes  Never
1.10 How often do you use someone else’s injection equipment after they have used it?
   Always  Usually  Sometimes  Never
1.11 Where have you injected in the past six months (choose all that apply)?
   House or apartment  Camp  Street/Alley  Car  Public Bathroom  Shelter  Detox/Rehab
   Abandoned House  Hotel/Motel  River
1.12 Where have you injected most frequently in the past six months?
   House or apartment  Camp  Street/Alley  Car  Public Bathroom  Shelter  Detox/Rehab
   Abandoned House  Hotel/Motel  River
1.13 If you used public bathrooms, where did you use most frequently?
   McDonald’s  Burger King  King Sooper’s  Starbucks  Library  Auraria

2.1 Have you ever read, seen, or heard of supervised injection facilities, or safe injection facilities?
   Yes  Maybe  No
2.2 Do you think that a supervised injection can achieve the following goals?
   Encourage safer injection practices  Reduce HIV and Hepatitis C  Increase access to health care
   Improve neighborhood problems
2.3 Would you accept a SIF in your neighborhood?
   Yes  No
2.4 In your opinion, how does the problem of public injecting in Denver compare to other cities?
   Worse in Denver  About the same/don’t know  Better in Denver

2.5 Do you support marijuana legalization?
   Yes  Maybe/don’t know  No

2.6 Do you support legalization or decriminalization of other drugs?
   Yes  Maybe/don’t know  No

2.7 How would you characterize your level of substance use, including alcohol, pot, and other drugs?
   Abstinent  Rare  Moderate  Heavy

3.1 Would use a supervised injection facility?
   Yes  Maybe  No

3.2 If there were a SIF near you, how frequently would you use it?
   Never  A few times a month  A few times a week  At least daily

3.3 If you were to overdose at a SIF and were no longer breathing, would you want to get naloxone?
   Yes  Don’t know/maybe  No

3.4 What are some reasons you would use a SIF (Check all that apply)?
   Be safe from police  Be safe from crime  Get sterile equipment  Be able to use in private
   Prevent and treat overdose  See health professionals  Get referrals to other services

3.5 What are some reasons you would not use a SIF?
   Not injecting anymore/trying to quit  I do not like to inject around other people  I only use at home
   I would feel unsafe at a SIF  Distance

3.6 Would you take public transportation to use a SIF?
   Yes  Maybe  No

3.7 Would you be worried about people like your boss or family seeing you near the SIF?
   Yes  Maybe  No

Subjective questions
   What are some reasons, other than those mentioned above, that supervised injection facilities could be a good idea?
   What are some reasons, other than those mentioned above, that supervised injection facilities could be a bad idea?
   If you support supervised injection, what information might dissuade you?
   If you do not support supervised injection, what information might convince you?
   What would be the best location for a supervised injection facility?
   If you inject with others, why did you inject with them instead of injecting alone?
   Are there any other reasons you would use a supervised injection facility?
   What would be a good way to prevent overdose in our community?
   What would be the best way to prevent public overdose in Denver?
DEPARTMENT OF HEALTH & HUMAN SERVICES

CONFIDENTIALITY
CERTIFICATE

UNIVERSITY OF NEBRASKA COLLEGE OF
PUBLIC HEALTH

conducting
research
known as

"PAVING THE POLICY PARKWAY FOR THE NATION'S
FIRST SUPERVISED INJECTION FACILITY"

In accordance with the provisions of section 301(d) of the Public Health Service Act 42 U.S.C. 241(d), this Certificate is issued in response to the request of the Principal Investigator, Ms. Rebecca Anderson, to protect the privacy of research subjects by withholding their identities from all persons not connected with this research. Ms. Rebecca Anderson is primarily responsible for the conduct of this research, which is funded by the Harm Reduction Action Center.

Under the authority vested in the Secretary of Health and Human Services by section 301(d), all persons who:

1. are enrolled in, employed by, or associated with University of Nebraska College of Public Health and its contractors or cooperating agencies, and

2. have in the course of their employment or association access to information that would identify individuals, who are the subjects of the research, pertaining to the project known as “Paving the Policy Parkway for the Nation's First Supervised Injection Facility”,

3. are hereby authorized to protect the privacy of the individuals, who are the subjects of that research, by withholding their names and other identifying characteristics from all persons not connected with the conduct of that research.

The purpose of this exploratory mixed methods study is to obtain information about supervised injection facilities, where people can use injection drugs under medical supervision, and potential clients of such facilities in Denver, Colorado. Measures collected include clients’ injection drug use patterns, and beliefs and knowledge about injection drug use among government officials and law enforcement officers.
A Certificate of Confidentiality is needed because sensitive information will be collected during the course of the study. The certificate will help researchers avoid involuntary disclosure that could expose subjects or their families to adverse economic, legal, psychological and social consequences. Subjects are coded alphanumerically. Consent forms will be stored in locked files. All information is kept on a password-protected hard drive, with no transfer to other devices. Digital voice prints will only be kept until material is transcribed, and the digital voice recorder will be destroyed immediately upon completion of the study.

This research begins on 12/28/2015, and is expected to end on 05/28/2017.

As provided in section 301 (d) of the Public Health Service Act 42 U.S.C. 241(d):

"Persons so authorized to protect the privacy of such individuals may not be compelled in any Federal, State, or local civil, criminal, administrative, legislative, or other proceedings to identify such individuals."

This Certificate does not protect you from being compelled to make disclosures that: (1) have been consented to in writing by the research subject or the subject’s legally authorized representative; (2) are required by the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301 et seq.) or regulations issued under that Act; or (3) have been requested from a research project funded by NIH or DHHS by authorized representatives of those agencies for the purpose of audit or program review.

This Certificate does not represent an endorsement of the research project by the Department of Health and Human Services. This Certificate is now in effect and will expire on 05/28/2017. The protection afforded by this Confidentiality Certificate is permanent with respect to any individual who participates as a research subject (i.e., about whom the investigator maintains identifying information) during the time the Certificate is in effect.

Sincerely,

Signed Date: 02/12/2016

Nora Volkow M.D.
Director