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2017 The External Cost of Spreading HIV by Injection Drug Abusers

In the United States between 2005 and 2009, 16.6% of people aged 12 or older living with HIV/AIDS had used an illicit drug intravenously (The NSDUH Report, 2010). Not only do drug users share needles and other drug paraphernalia, but they are also more likely to have unsafe sex. By doing so, HIV infected drug addicts are potentially spreading the disease to their sexual partners. To acquire drugs, many people are willing to trade sex. In August 2017, a former Philadelphia police narcotics officer, admitted to “trading heroin and other drugs for sexual favors from women,” illustrating the link between drugs and sex (Roebuck, 2017).

Whether it is through sex, the sharing of drug paraphernalia, or pregnancy, the outcome is the same: injection drug abuse increases the spread of HIV. In the healthcare market, injection drug addiction is a demand side negative externality and one of its external costs is the spread of HIV, which causes a market failure since it is not accounted for in the price. A market failure occurs when the price does not incorporate all the relevant information and therefore, the supply and demand curves are incorrect (Candon, 2017). Hence, the equilibrium price and quantity are suboptimal, creating an inefficient market (Candon, 2017). To fix this, private or public policies can be made to shift either the supply or demand curve to produce the optimal equilibrium (Candon, 2017). One common cause of healthcare market failures is externalities, which are behaviors by individuals that impose costs or benefits to others (Candon, 2017). These costs or benefits

are not incorporated into either the supply or demand curve and thus, the price is too high or low (Candon, 2017).

Injection drug addiction is a demand side negative externality that carries an external cost not accounted for in the demand curve. Therefore, there is an overprovision of goods. Drug addiction carries many external costs such as drug-related crime and the loss of productivity in society, but the spread of HIV caused by injection drug addiction creates the biggest external cost in terms of healthcare expenditures. Currently, with issues like the opioid epidemic in America, the relationship between injection drug addiction and the spread of HIV is critical due to the economic burden caused by both diseases. For both the private and public sectors of healthcare, it is to their benefit to implement policies that would shift the demand curve to the left and reduce the quantity demanded. This shift in the demand curve would mean that overall health expenditures would decrease. Drug abuse in America has been around for centuries. Drug use started with Ancient Greeks, Romans, and Egyptians using drugs such as peyote, opium, and cannabis (Crocq, 2007).

These drugs were then brought to America through colonization. In the 1800s, morphine, heroin, and cocaine were used across the country for their curative properties, but by the 1950s, most illicit drug use was suppressed by the federal government (Musto, 1991). However, in the 1960s, drugs such as hallucinogens, amphetamines, and cannabis were introduced, reinvigorating illicit drug use (Paparelli, 2011). Based on the 2013 National Survey on Drug Use and Health (NSUDH) report, 9.4% of the American population used illicit

drugs within the past month, which had increased from 8.3% in 2002 (NIDA, Nationwide Trends, 2015).

While marijuana is used the most, common drugs used intravenously (IV) such as cocaine had 1.5 million current users aged 12 or older and methamphetamine had 595,000 current users (NIDA, Nationwide Trends, 2015). Not only does drug abuse adversely affect individuals as well as hurt the people surrounding them, but it also costs society billions of dollars.

Figure 1. Drug abuse and addiction has imposed a high economic burden on American society. The 2013 NSUDH report stated that the “abuse of tobacco, alcohol, and illicit drugs is costly to our Nation, exacting more than \$740 billion annually in costs related to crime, lost work productivity, and health care,” illustrating the exorbitant cost of drug abuse (NIDA, Trends & Statistics, 2017).

Prescription opioids, which can be crushed and injected by syringe, carry a cost of \$78.5 billion, of which approximately 33% (\$26 billion) is devoted to healthcare related costs (NIDA, Trends & Statistics, 2017). While treating drug addiction does lower costs, drug addiction treatment also lowers the prevalence of viral infections. Drug users tend to participate in unsafe behaviors that promote infectious disease spread and therefore, drug use increases healthcare expenditures by introducing more disease into society. In particular, the external cost of HIV caused by injection drug addiction is important due to the amount of medical savings that could be generated by averting diagnoses. In 2010 dollars, the treatment cost over a lifetime per HIV diagnosis was estimated at \$379,668 (CDC, HIV Cost-effectiveness, 2017).

While certain states tend to have more financial burden due to higher numbers of HIV diagnoses, the “total lifetime treatment cost for HIV based on new diagnoses in 2009 was estimated to be \$16.6 billion,” illustrating the great financial burden placed on both state and federal governments (CDC, HIV Cost-effectiveness, 2017). While HIV diagnoses are only partially related to drug addiction, they are preventable. Thus, the rate of prevalence can be decreased, resulting in significant medical savings. For example, from 1991-2006, American prevention programs averted ~361,878 HIV infections, which was estimated to produce \$129.9 billion in medical savings (Farmhan, 2010). Unlike the price of treating drug addiction, the cost of the spread of HIV is not incorporated in the market, resulting in an incorrect price off which the demand and supply curves are generated.

To correct the price and create an optimal equilibrium price and quantity, the costs per HIV diagnosis caused by injection drug addiction must be included. While injection drug addiction is incorporated into the healthcare market, its role as an externality is not since the external cost of spreading HIV has not been factored in. By not factoring in this cost, the demand curve is wrong and needs to be shifted to the left to achieve an optimal market. Currently, there is an overprovision of goods, showing that the price needs to be higher to lower the quantity demanded. In 2016, 2,224 HIV diagnoses were caused by injection drug use while another 1,201 diagnoses were due to male-to-male sexual contact and injection drug use (CDC, HIV Statistics Overview, 2017). There is a direct correlation between injection drug abuse and HIV diagnoses due to the sharing of drug paraphernalia, unsafe sex, and mother-to-child transmission. Since HIV spread is not included in the market price, the cost of

the spread is reflected in the market in other ways, impacting patients, payers, and providers. With growing national crises such as the opioid epidemic, the external cost of injection drug addiction will only continue to grow and continue to affect these players unless the cost is internalized.

Figure 1. Distribution of the number of diagnoses of HIV in 2016 by transmission category
Source: "Statistics Overview." HIV/AIDS, Centers for Disease Control and Prevention, 30 Nov. 2017, [www. cdc. gov/hiv/statistics/overview/index. html](http://www.cdc.gov/hiv/statistics/overview/index.html). Overall, the implication of this market failure is that costs increase, particularly for payers and patients, to compensate for the suboptimal price currently set in the market.

Patients are faced with higher premiums to cross subsidize the medical costs of HIV infected drug addicts, who oftentimes do not have their own health insurance plans. In a study by Cummings et al., the results indicated that "one-third of those with an illicit drug use disorder were uninsured" (Cummings, 2014). Due to the Emergency Medical Treatment and Labor Act (EMTALA), uninsured drug addicted individuals will be treated, but are unable to pay. The insurance companies are charged higher rates by hospitals to cover the care of uninsured individuals, leading to insurers charging patients higher premiums. The net result is higher costs to payers and patients. While providers are not impacted by costs, they are capable of influencing access to care.

Currently, there is a social stigma to treating drug addicted individuals. Other patients may not return to see providers if they see drug addicted individuals in clinics, providing an incentive for providers to forgo treating drug addicts.

While education about HIV could reduce its spread, the main solution would be to decrease the amount of injection drug addiction overall.

One current solution is that the federal government has been providing syringe services programs, which give access to sterile needles and syringes for drug addicts. The federal government's goal is to facilitate the safe disposal of used needles and syringes as well as provide sterile needles and syringes. Oftentimes, individuals can access these items without a prescription (CDC, Syringe Services Programs, 2017). Additionally, these syringe services programs provide access to disease testing, referrals to drug treatment facilities, and education surrounding safe sex and injection procedures. Research surrounding syringe services programs has shown that these programs "reduce new HIV and viral hepatitis infections" and they "save health care dollars by preventing infections," illustrating that these programs are essential for decreasing the cost of HIV spread by injection drug addiction (CDC, Syringe Services Program Info Sheet, 2017). These programs are funded based on strict guidelines placed by the Centers for Disease Control and Prevention (CDC) and the Substance Abuse and Mental Health Services Administration (SAMHSA). While it costs the federal government money to run these programs, it is still more cost-effective to implement syringe services programs than pay the healthcare costs of HIV-infected individuals. Figure 1.

The connections between injection drug use and the spread of HIV. Source: "Syringe Services Programs." HIV/AIDS, Centers for Disease Control and Prevention, 28 Sept. 2017, www.cdc.gov/hiv/risk/ssps.html.

While the federal government has successfully reduced the spread of HIV by injection drug addicts through syringe services programs, they could reduce it further by encouraging injection drug addiction treatment. One method to do so is to provide a monetary incentive for providers to treat drug addiction in their clinics. Currently, there is a stigma surrounding treating drug addicts, which may be due to the societal perception of drug addiction as a moral failing rather than a chronic disease of the brain.

To combat the stigma and increase access to treatment, an incentive to physicians to provide treatment could be made by increasing Medicare and/or Medicaid reimbursement rates. By giving an incentive to providers, the federal government would potentially decrease healthcare costs related to drug addiction and HIV overall for payers and patients. While providing a monetary incentive to providers should be effective, the federal government could reduce the spread of HIV by injection drug use even further by removing the physician waiver requirement to prescribe certain medications known to assist treatment.

For example, buprenorphine binds to the same receptors in the brain as opioids and relieves craving for the opioid without providing the high (SAMHSA, Buprenorphine, 2016). However, physicians must complete eight hours of training and apply for a physician waiver before they can prescribe buprenorphine (SAMHSA, Buprenorphine Waiver Management, 2017). The preliminary waiver allows a physician to treat up to thirty patients with buprenorphine (SAMHSA, Physician and Program Data, 2017).

Physicians can apply for a patient limit increase to first 100 patients and then after a year, to 275 patients (SAMHSA, Physician and Program Data, 2017).

These regulations present physicians with a barrier to provide treatment and patients with a barrier to access treatments. A 2005 congressionally mandated evaluation study found that “ the 30-patient limit on individual physician practices, as well as continuing cost and reimbursement issues, have dampened the full potential of buprenorphine to improve access” (SAMHSA, Physician and Program Data, 2017). There is currently no clear incentive for providers to obtain this training and waiver. Consequently, an effective solution to reducing the spread of HIV by injection drug users may be for the federal government to provide a monetary incentive for treating drug users and to remove the barriers to prescribing medications that alleviate craving. While there are public policies to fight this demand side negative externality, there are no clear private policies in place to fight either injection drug use or the spread of HIV caused by injection drug use. Although hospitals do charge private insurers more to compensate for the care given to uninsured drug addicts due to EMTALA, private insurers do not directly cover this cost.

Instead, they raise premiums. Therefore, there is no clear incentive for private insurers to drive the price higher to fix the current suboptimal price in the market. However, private insurers do have an incentive to treat the drug addictions of their already insured patients. Under the Affordable Care Act, drug addiction is considered a preexisting condition so private insurers cannot deny coverage to drug addicts or charge them a higher premium.

Unfortunately, for private insurers, drug addicts tend to visit the hospital and stay longer than other patients, costing insurance companies thousands of dollars. Additionally, a diagnosis of HIV would also cost the insurer thousands. Hence, it would be to private insurers' benefit to treat as many of their drug addicted consumers as possible since insurers cannot increase these individuals' premium costs or deny them coverage.

One simple private solution to encourage drug addiction treatment is for private insurers to provide education to patients regarding their benefits. In her paper, Cummings and her colleagues found that private insurance holders with alcohol dependence had increased access to specialty treatment than the uninsured only if they understood their benefits (Cummings, 2014). However, this same relationship was not found for those with drug dependence, which is most likely due to the illegality of the drugs being used (Cummings, 2014). Since most private insurance is provided through an employer, privately insured drug addicts may be scared to access treatment even if they are aware that this treatment is covered by their benefits. To decrease injection drug addiction in their consumer population, private insurers should first provide their consumers with the knowledge that addiction treatment is covered by their insurance plan, but also with assurance that there would be no backlash if this treatment were to be sought out. This provision of education and assurance may lead to a reduction in injection drug addiction and consequently, the spread of HIV. Private insurers would benefit from this since their consumers' overall healthcare expenditures would decrease, giving the potential for a greater

profitmargin. Privately insured patients would experience greater access, and providers would most likely experience greater demand.

Overall, the healthcare expenditures directed to drug addiction and HIV would decrease because more individuals would be receiving treatment quicker. Typically, demand-side negative externalities can be corrected by implementing a tax on the good, but in the case of injection drug addiction, this solution is not feasible since injection drug use is already illicit. For example, cigarettes are taxed at both the federal and state level to internalize the external cost of smoking.

However, unlike cigarettes, high abuse injection drugs are illegal and therefore, a tax cannot be set on them. Since a tax is not an option in this situation, other incentives must be put in place to either decrease injection drug addiction or decrease the spread of HIV caused by injection drug addiction. The most effective player in decreasing injection drug use and the spread of HIV is the federal government. While private insurers do have an incentive to limit injection drug addiction in their consumers, if premiums are already set high enough to make an adequate profit, private insurers will not feel pressured to incentivize treatment.

Conversely, the federal government has already proven that it can reduce the spread of HIV through syringe services programs, but it also has the potential to reduce injection drug abuse by improving access to treatment.

By providing a monetary incentive to providers and removing regulation around medication-assisted treatments, the federal government could increase access to addiction treatment. A policy that would increase Medicare

reimbursement rates for physicians that treat drug addiction would succeed because the cost of this program is still less than the cost of drug addiction and a potential HIV diagnosis. It is in society's best interest to treat drug addiction because it would mean lower healthcare expenditures overall, less HIV diagnoses, less drug-related crime, etc. While a critical view has been presented regarding injection drug addiction as a demand side negative externality with a focus on the spread of HIV as the external cost, there is still a lack of information regarding private addiction treatment facilities and their impact on the issue.

The purpose of addiction treatment facilities is to end drug users' dependence. However, there is a monetary incentive for these facilities to not fulfill their goal. These facilities want to maintain a high demand for their services so that they can charge a higher price for their services. It would be highly interesting to have statistics regarding the rates of success of private addiction treatment facilities and the rate of HIV diagnoses of injection drug users who have gone to these facilities. Another limitation of the research regarding this issue is that HIV can be spread in a few different ways. Between sharing drug paraphernalia and sexual transmission, it is often difficult to pinpoint exactly which one caused the spread since many drug users share needles and engage in unsafe sex concurrently. While all research comes with its own set of limitations, overall, it is clear that society can help contain healthcare expenditures in America by reducing rates of injection drug addiction, which prevents the spread of HIV, a costly disease. To reduce costs, there must be a shift in the healthcare system to promote access to drug addiction treatment.

The federal and state governments are the ideal players to implement incentives for physicians and other healthcare professionals to treat injection drug users. Since the health care expenditure savings are so high, it is especially worth the federal and state governments' efforts, time, and money to internalize the external cost through either the suggested policies above or through other policies that correct the market price. Cut out parts: SAMHSA should remove regulation on prescribing medications to reduce drug cravings, because if a physician can prescribe the opioid for pain, that physician should be able to prescribe the medication necessary to reduce craving for the opioid.