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# What Works? A Meta-Analysis of Quantitative Studies Regarding Heroin Policy

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EASTERN KENTUCKY UNIVERSITY

What Works? A Meta-Analysis of Quantitative Studies  
Regarding Heroin Policy

Honors Thesis  
Submitted  
in Partial Fulfillment  
of the  
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Fall 2016

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# What Works? A Meta-Analysis of Quantitative Studies Regarding Heroin Policy

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This project aimed to aid legislators by presenting quantitative evidence on what policies existing literature supports as working in dealing with the problem of heroin use in order to shift policies to a more effective approach. Chi Square analysis of 100 quantitative studies revealed that there is a relationship between the type of approach and outcome of the study, indicating that maintenance-focused approaches are more likely to work than the other approaches examined. The study concluded that, while the literature finds consensus on the idea that “maintenance works”, the details of implementation cause disagreement between fields; overall, maintenance works for those who want it to work and policy makers should focus on implementing broad legislation where the details of policy can be worked out based on each community’s unique situation, the demand for services, and in seeking to use resources in the most effective and efficient manner.

*Keywords and phrases:* heroin, policy, harm reduction, meta-analysis, maintenance, groupthink, goal conflict, means misalignment

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### *Introduction*

Few topics incite such an emotionally strong reaction as does heroin. In today's society, it has become synonymous with abuse, destruction, and even death, and no one is immune from its effects on individuals and society as a whole. Not only have national and international directives sought to place heightened importance on prevention of the destruction in peoples' lives caused by heroin, but policymakers have faced increasing pressure from their constituencies to solve the problem of heroin. But what exactly is the problem of heroin? It is the quadrupled rate of heroin related overdose deaths from 2002 to 2013 and the 18,893 overdose deaths related to prescription pain relievers and 10,574 related to heroin in 2014 (Narconon). It is the 586,000 Americans 12 or older who had a substance use disorder involving heroin and the 23% of individuals who use heroin and develop opioid addiction. It is the 900% increase in the amount of heroin confiscated in Cincinnati between 2010 and 2011, the similar trend in Chicago's suburbs, and in central Michigan, as well as small rural Kentucky and West Virginian towns where as many as 9, 14, 26, and even 50 individuals have overdosed over the course of a few hours in "mass heroin overdoses" (Narconon, Kocher). It is an epidemic worthy of the designation.

This problem has a solution. In fact, the problem has many proposed solutions. As these solutions have been tried and evaluated, a large body of literature has focused on heroin policy and effectiveness of approaches based on each approach's unique goals. Over time, heroin use and abuse has been approached through many lenses, of crime, health, medicine, legal, and economic, among others. With so many conflicting approaches, policymakers have, to date, been limited in their ability to implement effective legislation because, although some approaches were seen as more effective than others, the many interests of the many groups involved conflicted, hindering the realization of the approaches into practice. The current prevalence of heroin use and damaging consequences of addiction have acted as a call to action for policy makers, however, making them, and society, painfully aware of the lack of implementation of effective policy to date.

This project aimed to aid legislators by presenting quantitative evidence on what policies existing literature supports as working in dealing with the problem of heroin use in order to shift policies to a more effective approach. As a secondary objective, it sought to address why, in the face of a seemingly present consensus within literature, policy is not being implemented. To gauge the presence of a consensus in existing literature, the study used a meta-analysis approach through the review and coding of 100 quantitative outcome evaluations of heroin abuse treatment programs or techniques. Additionally, examination of methods used over time in dealing with addiction and the presence of goal conflict, groupthink, and misalignment between fields offers a probable explanation for the difficulties legislators face in reaching a policy consensus.



### *Exploring and Explaining the Heroin Epidemic*

While this analysis aims to divulge the consensus of existing literature regarding the most effective approach in dealing with the problem of heroin use and addiction, knowing what research says is only half the battle. Taking that consensus and applying it to the situation is often the more difficult step, and it has proven to be so in the heroin epidemic as well. While there seems to be a general literary consensus, even among and between fields, very little is being done to implement the policies that have been shown to work. This prompts the questions, “What are the reasons for this consensus?” and “Why, despite the consensus, is so little being done to apply it?” To begin addressing these questions, it is helpful to explore what is already known about the heroin epidemic, both historically and currently, and to understand the different fields involved, the way those fields define and approach aspects of heroin addiction, and the issues plaguing the policy-making process that can influence the implementation of policy in response to the heroin epidemic. Therein, as will be seen, lies the possible explanation for the lacking implementation.

### *Heroin in a Historical Context*

Despite the present state of the heroin epidemic, one could easily believe that it is a uniquely American concern that has skyrocketed in social prevalence as of late. While the latter is true, with the Obama administration making clear that addressing the epidemic is of the utmost priority at the National Rx Drug Abuse and Heroin Summit in

Early 2016 (White House Office of the Press Secretary, 2016), heroin has been an issue of universal, rather than exclusively American, concern since the 1800's and even before.

Heroin as a drug has its roots in the long history of opioids, which are derived from opium, the poppy plant. In Mesopotamia in the 3400's B.C, opium use began. It then expanded from Egypt and Persia to Europe, India, and China, and then to the United States in the 1700's as a therapeutic agent, though users and physicians alike eventually noted opium's addictive qualities. In 1805, morphine was derived from opium as a pain reliever, and because physicians believed that the addictive qualities of opium had been tamed with the derivation of morphine, which was lauded as being reliable, long lasting, and safe, opium and morphine dependence and addiction increased. This abuse, however, was not recreational; rather it stemmed from the physicians' ignorance to the destructive qualities of the drugs, leading to over-use and addiction. In 1874, heroin was synthesized for the first time, from morphine by C.R. Wright in England, but it was not produced commercially until 1895 when Heinrich Dreser diluted morphine with acetyls producing the same heroin (or diacetylmorphine) at Bayer Pharmaceuticals. Bayer advertised heroin as non-addictive and it was also used as a replacement opioid, but this time for morphine.

Heroin was the penultimate of a series of drugs developed from opium that were hoped to, by being purer and stronger, be less addictive than the prior drug. Additionally, in combination with the hypodermic needle, recreational use of the drugs for a high became possible during the 19<sup>th</sup> century. As each new drug was introduced, touting less destructive side effects, the previous was not only replaced, but also censured. For example, after the introduction of morphine and later heroin, Britain passed the Opium

Act in 1878 with hopes of reducing opium consumption by restricting the use to registered Chinese opium smokers and Indian opium eaters, while San Francisco banned smoking opium in the city limits.

While it is important to understand the origins of heroin as a drug, this study focuses on the perceptions and responses to heroin use and addiction, so understanding the societal response alongside the history of the drug is imperative. Beginning in the 1800's in the United Kingdom, recovery and temperance were key solutions to addiction and dependence, as seen in the way each new, "safer" opium derivative was used to replace the prior, as the prior was condemned and access to it was restricted. This was the case, as mentioned, with morphine, and then again in 1898 when heroin was introduced as a substitution for morphine. Additionally, much like the drug use itself, the issue as a whole was seen through a medical lens. This medical lens approached addiction as an issue that needed "treatment", though treatment varied in scope and practice (Berridge 2012; Mold 2004). Most often, the treatment was replacing one opioid with another; even in the United States in 1900, the St. James Society began sending heroin to morphine addicts in order to help them quit. Though the social issues associated with addiction were acknowledged during this time, they were not addressed with as much vigor as treating the addiction itself (Mold 2004).

As time progressed, however, "curing" became the buzz word over "treatment" and emphasis was placed on true abstinence (Berridge 2012). Physicians had begun discussing the side effects of using heroin as a step-down cure for morphine and, in a series of scholarly articles, many physicians came to the conclusion that the same withdrawal symptoms and detrimental effects of addiction were present, regardless of the

use of heroin or morphine, and that “treatment” was no longer effective, switching the end-goal to a complete curing of the addiction. In 1906, Alexander Lambert and Charles Towns began advocating for their cure for the addiction- a seven-day regimen including a five-day purge of the drug from the addicts’ body. These individuals were greatly involved in drug legislation in the United States, in the early 1900’s, which highlights, in a way, the general approach taken by the United States in contrast to that taken in the United Kingdom.

In the United States, the approach included prohibitive legislation, a generalized approach to the entire problem of opioid use, and initiating an increasingly penal era of drug policy; in the United Kingdom, the approach was more centered on the individual addicts with treatment (Berridge 2012). Of course, there were elements of both approaches throughout, as seen in Lambert and Towns’ “cure” in the United States and legislation passed in the United Kingdom to limit opium use, but generally, the two countries approached the issue of heroin and opioid addiction in dissimilar ways. The discrepancy between the two countries may have its roots in the origins of the countries’ battles with eradicating opioids, heroin, and the associated addiction. The United States took a tough-on-drugs approach through legislative action and politically charged campaigns, bypassing the addicts as a point of action in favor of law enforcement and legislation. Because of this, the United States got caught up in the language and details of combatting addiction and the heroin epidemic, making reaching a policy consensus impossible since the many groups involved had different goals, definitions, and thought processes. England’s roots of approaching addiction medically and with treatment for the individuals affected by addiction, however, allowed them to focus on the addiction itself

and find a solution through supportive, rather than restrictive, legislation that got at the root of the problem- the addicts. Overall, the culprit seems to have been federalism and separation of powers in the United States versus a unitary parliamentary government in England. Because this was happening in the Progressive Era, when federal authority was generally expanding, the issue was dealt with federally rather than by the states, meaning the governments' systems were influential on the way the countries progressed in dealing with the heroin epidemic.

With the focus on prohibitive legislation in the United States, the early 1900's saw much legislative action, including the U.S. Congress's Pure Food and Drug Act, which required that medicines have contents labeling and reduced the availability and consumption of opiates, and the county's first federal drug prohibition in 1909, which outlawed the import of opium. This ban was in preparation for the Shanghai Conference, which aimed to address the ongoing problem of opioid trade between India, China, and western Europe. At the conference, the U.S. encouraged suppressing the sale of opium to China and, headed by Dr. Hamilton Wright and Episcopal Bishop Henry Brent, the American delegation attempted to convince the rest of the international delegates of the detrimental effects of opium. In 1914, the Harrison Narcotics Act was passed, which required physicians register and pay a tax to prescribe narcotics, and in 1919, the League of Nations met, where American legislators pressed for international restrictions on drugs and trafficking. In 1922, the Narcotics Import and Export Act was passed, which restricted the importation of opium with the exception of medical use, and 1923 saw the U.S. Treasury Department's Narcotic's Division ban all legal narcotics sales, forcing the

sale and use of heroin to addicts and the streets. Finally, in 1924, the Heroin Act made the manufacture and possession of heroin illegal.

With the onslaught of legislation through the 1910's and 20's, addiction began to be redefined as a social disease, especially in America, away from one experienced on the individual level. In this transition, the two spheres- social and individual- were distinct in dealing with the problem; the health of addicts was of medical concern while the social problems were addressed by law enforcement and the penal system (Mold 2004). This separation was a root of much contradiction and confusion in the early days of heroin policy. In the United Kingdom, 1926 saw the introduction of the Rolleston Report, which advocated the idea that medicine needed to be involved in treating the addiction, shifting the focus of addiction back from crime to disease and sparking the "British System" of maintenance and liberal pragmatism (Berridge 2012; Mold 2004; Seddon, Ralphs, and Williams 2008). Within this era, the Atlantic separated the two main approaches toward heroin policy, with America maintaining supply- and demand-reduction through penal measures and Europe, and especially Britain, emphasizing harm-reduction and treatment of the addiction. The 1920's, then, set the tone for the next 40 years of drug and addiction policy and, as the decades progressed, there was an emphasis on locating the disease within society. To do this, surveillance and government intervention were increased, and, combined with approaching the issue with a public health motivation, merging of the medical and social aspects of drug addiction began (Berridge 2012, Mold 2004).

The 1960's and 70's saw drastic changes to drug policy in America. U.S. involvement in Vietnam was blamed for the surge in smuggled heroin, and the number of

addicts reached over 750,000. While Britain and other European countries had been treating addiction as a medical issue with heroin maintenance treatment for years and would continue to do so even into the present (Uchtenhagen 2011), harm reduction and maintenance treatment were being introduced for the first time in America as pioneered by Vincint Dole and Marie Nyswander in 1963 (Berridge 2012; Latowsky 2006; Uchtenhagen 2011). This maintenance approach did not use heroin, however, because it was still stigmatized as an illicit drug; rather, methadone was the substitution drug of choice because it was viewed as a medical intervention, in contrast to the fear of enabling addicts that would occur with using heroin itself as the maintenance drug (Berridge 2012). While morphine was the original substitute for street heroin in the U.S., it was abolished as a substitution due to the continuing prohibitive attitude toward drugs that plagued American policy during this time; morphine would be viewed similarly to how heroin as a substitute would be viewed, as enabling the addict by giving them illicit substances (Uchtenhagen 2011). In 1970, the Controlled Substance Act was passed, which categorized drugs, and mandated regulations and penalties for use. Maintenance treatments struggled continuously, and still do, with the stigma attached to drug use and the popular view of addiction as criminal behavior. While America was taking the first steps toward harm-reduction during this time, the “British System” was engaged in a nuanced shift-in-focus from long-term maintenance with minimum dose prescribing to short-term Methadone maintenance with abstinence and recovery as the ultimate goal (Berridge 2012).

The 1980’s became characterized by a universally increased focus on reducing the harm from drugs within the context of America’s “War on Drugs”, which many now

claim as being overly punitive, expensive, and ineffective (Berridge 2012; Reuter 2013). In America, drug use had peaked in the 1970's and, after tracking specific epidemics, the focus was on eradicating the heroin problem (Compton et al. 2005). Within the increasingly punitive approach, which aimed at reducing the supply of and demand for heroin, conflict arose as advocates of harm reduction strategies attempted to work toward a new public health imperative- preventing the transmission of HIV/AIDS (Berridge 2012). There was a renewed hierarchy of objectives in America, with a shift from short-term maintenance with the goal of abstinence to long-term maintenance and needle-exchange programs to improve public health (Berridge 2012; Seddon, Ralphs, and Williams 2008). Maintenance programs eventually became a cornerstone for prevention of HIV/AIDS and managing dependence to reduce harm for the addicted individuals and the community as a whole (Uchtenhagen 2011). This approach, however, became controversial in the United States due to its conflict with the traditional supply- and demand-reduction approaches. Treatment and public health approaches were able to gain legitimacy through the "brain disease model", however, wherein the United States National Institute on Drug Abuse introduced addiction as a chronic, relapsing brain disorder in need of pharmaceutical interventions (Berridge 2012). Because of this science-based justification, harm-reduction approaches were able to gain support and the controversy was somewhat mitigated.

With this newly introduced view of addiction, the 1990's began a transition to the idea that "Treatment Works" in a variety of objectives, including keeping addicts out of prison, which was of growing concern as the criminal justice system began to feel the stresses of increased punitiveness over the last few decades. With this realization,



maintenance and methadone were revived alongside public health initiatives. Within this newly user-focused movement, a shift from the community-focused public health movement of years before, prescribing was seen as a central strategy for combatting the problem (Berridge 2012). Over the past two decades, maintenance has been advocated as important not just for harm-reduction overall, but specifically in preventing the transmission of diseases like HIV and AIDS (Latowsky 2006) and more research is being done on its effectiveness.

With the success of methadone as maintenance treatment, Levacetylmethadol (LAAM) was approved in 1993 for licensed narcotic treatment programs and the FDA granted exclusive authority for dispensing methadone and LAAM for treatment, though with many regulatory hurdles (Rawson et al. 1998). In 2002, buprenorphine was approved as an additional opioid agonist due to its advantages over methadone, such as less stigma, lower overdose rates, and less regulation, and in 2010, naltrexone was approved in a new injectable form, which improved adherence rates and blocked the reinforcing effects of heroin with no opioid-like effects (Gordon, Kinlock, and Miller 2012).

In the more recent past, a ten-year review of the 1998 UN General Assembly Special Session's goal of reducing drug production and consumption concluded that no prevention, treatment, or enforcement strategies that have been tried have been effective and that, at this point, the goal should be to reduce the damaging consequences of supply- and demand- reduction strategies and, instead, focus on other harm-reduction based avenues of dealing with the problem (Reuter 2009). While a solution has not been found through the volatile course of policy in the past 200 years, with a constant tug of war

between supply- and demand- reduction and harm-reduction approaches, a policy consensus would undoubtedly help in addressing heroin as an issue. As history seems to indicate, however, maintenance approaches have survived the test of time and, while they have evolved and changed since being used initially, show many benefits in addressing heroin addiction as well as the public health issues that arise from it.

### *Understanding the Approaches*

A large part of understanding not only the history of heroin policy, but also its current state and the future of addressing the ever-expanding heroin epidemic, lies in the language used by proponents of different policy perspectives and the definitions adhered to by professionals in each of many related fields in regard to the potential approaches. After delineating the two main spheres of policy, more nuanced positions within the approaches will be explained, as will be the different focuses of policy related to each approach and how the chosen emphasis of different approaches serves to classify studies in this meta-analysis.

To begin, when dealing with the problem of heroin, there are two main spheres. Within these spheres are more fine-tuned approaches. The first sphere is that of supply and demand reduction, which focuses on reducing either the amount of the drug available (supply reduction) or the demand for that drug (demand reduction), typically through regulation or prohibition (Greenfield and Paoli 2012). Typically, this approach is punitive in nature, and has been historically advocated for by the criminal justice system and those adhering to a crime-control model of thinking. Under this thought process,

controlling crime and criminals in the main goal of policy, with proponents accentuating the big picture of reducing crime to protect and better society through enforcing laws and maintaining social order, as opposed to the protection of individuals. Supply and demand reduction, as a unified crime-control-centered approach, is known to cause unintended consequences and have extra costs due to the focus on aggressive use of the criminal justice system and quick procedural administration of justice. Because of this, the approach leads to a paradox in that the goal is to improve the societal situation by reducing production and consumption, but the adverse consequences often lead to no aggregate change in the supply of the drug (Greenfield and Paoli 2012).

The second sphere is that of harm reduction, which has a less than clear definition. Rather than a definitive designation, harm reduction is more of a goal, which purposes to reduce harm associated with the use of the drug without necessarily reducing drug consumption itself. Reducing use is a principle, but not sole, means of reducing harm (Greenfield and Paoli 2012). The International Harm Reduction Association defines harm reduction broadly as, “policies, programs, and practices that aim primarily to reduce the adverse health, social and economic consequences of the use of legal and illegal psychoactive drugs without necessarily reducing drug consumption”.

Additionally, harm reduction cuts across the spectrum from safer use to managed use, and then further to abstinence. The approach aims to meet the addicted individual where they are without condemning their behaviors, and instead to work with them and the community as a whole to minimize the harmful effects of drug use and the individuals’ behaviors (Marlatt and Witkiewitz 2010).

When looking at both supply and demand reduction and harm reduction, there is often a juxtaposition of the approaches and of those who adhere to each school of thought. Opponents of harm reduction tend to fear that reducing the harmfulness of the drug use will increase use, while opponents of use reduction fear reducing use of the drugs will increase the harmfulness of the drug use. It has come to be understood, however, that both approaches have a role in dealing with any epidemic, including those of drugs like heroin, but each approach has strengths and weaknesses that must be considered in implementation, and they must ultimately be used at different times and when most appropriate and beneficial, rather than being advocated as being universally beneficial (Caulkins, Tragler, and Wallner 2009).

Within harm reduction strategies, there are two main avenues: one dealing with the community and the other dealing with the individual. In dealing with the community is the public health approach, where community-based programs such as needle-exchanges, public education opportunities, and support groups are implemented to educate the community as a whole about harms and issues associated with heroin use and the effects of the epidemic, as well as to reduce some of the more immediate public harms, such as transmission of communicable diseases with needle exchange programs. The public health approach centers its strategy of reducing harm within the context of the community, placing less focus on the addicts themselves.

The other avenue within harm reduction is treatment, which focusses on the addicted individual and how to treat their addiction, as if it is a sickness or disease (Gelkopf, Levitt, and Bleich 2002), but also with the intention of educating the addicts and encouraging responsible use and personal accountability for their addiction

(Koutroiulis 2000). Sometimes, abstinence is the ultimate goal of treatment, but within the treatment aspect of harm reduction is the notion that harm can be reduced without necessitating that users stop their drug use, which is, while less ambitious, more achievable than an ultimate objective of abstinence (Koutroulis 2000).

My meta-analysis focuses on treatment approaches, distinguishing between maintenance and all other treatment approaches, which often encompass abstinence as the primary treatment goal whether the method be rehabilitation, detoxification, behavioral and cognitive therapies, or forced withdrawal. Abstinence, as a treatment approach, focuses on the addiction with the end goal of ending the addiction through whatever means necessary. On the other hand, maintenance approaches focus on survival and allowing the addicted individuals to proceed as more-or-less functioning members of society while reducing the harm associated with their use. Under maintenance, abstinence or beating the addiction is a secondary goal of treatment, with emphasis placed on the health and survival of the addict.

To understand the goal of maintenance treatments, it is important to understand the alternative- withdrawing. The process for withdrawing from opioids like heroin is so torturous that most individuals cannot physically or emotionally bear it, leading to relapse. Individuals feel as though they are dying and, in a sense, they are, because their bodies are unable to function without the presence of the drug in their systems. Addicts are dependent on the drug to function and live, so maintenance treatments, which focus on survival, allow individuals to maintain their normal level of functioning in society, maintaining their quality of life by managing the addiction with drugs that are safer, more controlled, administered clinically, and ultimately can be reduced slowly, over time,

under the supervision of professionals, and with less withdrawal symptoms. In this way, maintenance treatments offer the benefit of being a way to achieve long-term abstinence, but in a way that is not as emotionally, mentally, or physically damaging, and in a way that is more manageable and sustainable as to prevent relapse.

Within maintenance treatments, there are a multitude of specific approaches, utilizing different drugs, dosages, time frames, maintenance schedules, administration procedures, environments, requirements of the addicts, and costs. Exploring each of these is beyond the scope of this meta-analysis, mainly because maintenance as a broad approach works, and the lack of implementation lies the smaller details of specific maintenance treatments, on which policy makers and professionals cannot agree. This study, as will be explained in more detail later, does not discriminate between the details of maintenance treatments. Instead, it simply classifies the studies as either maintenance or not maintenance, based on the treatment approach used. Because of this, the study is unable to discern between maintenance approaches nor is it able to evaluate the efficacy among them.

### *Policy and Problems*

With an understanding of the history of heroin and the language associated with strategies of combatting the epidemic, it is apparent that there is still much to be done in regards to research on the topic. While heroin itself is not a new problem, the prevalence of the problem is, and historically appropriate approaches are no longer so. The consensus of the literature, as will be confirmed by this meta-analysis, is that under the umbrella of harm-reduction strategies, treatment options, and more specifically

maintenance treatments, are effective in dealing with the heroin problem based on a variety of goals for “effectiveness”. With that consensus, the main concern lies in why these policies and strategies are not being implemented. This leads to the question of why, in the face of mounting evidence in favor of maintenance treatment approaches to heroin, there is a lack of policy consensus and implementation. This project takes steps to answer this question, first by quantitatively analyzing literature to identify a potential consensus, and then by exploring potential reasons for the lack of implementation seen in practice.

### *Methods*

This project was a meta-analysis of quantitative studies regarding approaches to heroin addiction and abuse. The goal of this analysis was to aid legislators by presenting quantitative evidence on what policies work best in dealing with the problem of heroin use so that this knowledge can be used to shift policies to a more effective approach. The procedures for conducting this analysis can be described as follows: 1, determine the inclusion criteria for studies; 2, identify and select studies; 3, review and coding of studies; 4, Chi-Square analysis of coded results.

#### 1. Inclusion Criteria

Without access to software programs used in most meta-analyses that screen abstracts from large databases, and without the man-power that can be used to supplement and review the work of abstract screening software, I was severely limited in my study selection. Because of these limitations, my data collection was done

completely by hand. At the beginning of the project, I determined a simple set of inclusion criteria that I would use to determine the eligibility of studies. This criteria, however, was modified and refined as the project continued.

Eligible studies were determined to be quantitative outcome evaluations of heroin abuse treatment programs or specific techniques. The original set of inclusion criteria mandated random-controlled trials and either pre-test-post-test or treatment-comparison designs, however this criterion was determined to be too stringent considering the severe ethical limitations in dealing with special populations, as many of the studies did. Additionally, my inclusion criteria did not limit the location, age group, or timeframe of studies because I wanted to combat the effects of groupthink and goal conflict by integrating quantitative studies from a very diverse dataset to truly arrive at a consensus of the broad literature available on the subject.

## 2. Selection of Studies

The starting point for selecting items was my knowledge of existing literature and conversations with experts and colleagues in various fields. Additionally, I utilized online databases, specifically Web of Science, and inspected the bibliographies and reference lists of existing meta-analyses. My final list of analyzed sources was compiled mostly from the reference lists of existing meta-analyses exploring similar topics as mine aimed to explore. The reasoning behind this was two fold. First, without an inclusion criteria filter to screen for quality in the studies, I operated under the assumption that studies that were included in other meta-analyses (of which, all utilized both abstract/database screening software and large teams of reviewers and coders) were deemed by those researchers to be of quality and, therefore, were of a standard of quality



that could be included in my analysis. Second, without advanced database screening software, utilizing smaller collections of pertinent studies was beneficial in the issue of practicality.

While my inclusion criteria are incredibly simple and would seem to open the floodgates of allowing studies to be included, I also utilized soft-screening practices throughout my search to determine if a study was eligible. Upon determining an existing meta-analysis was examining a topic tantamount to mine, I screened its list of analyzed sources to ensure that the studies included were quantitative outcome studies and fit the scope of my research question. If they did not, they were excluded. Additionally, the studies that seemingly fit my inclusion criteria were screened for moral and ethical legitimacy, as well as for general quality and a lack of questionable methods. While these soft screening measures were rudimentary, they allowed for a second line of defense in preventing poor studies from being included, similar to when more complex meta-analyses use teams of reviewers and coders to determine eligibility of studies identified by the abstract-screening software.

### 3. Review and Coding

When it came to reviewing and coding the studies, it was imperative that I maintain the initially determined scope of my project. In reviewing the studies, it became increasingly apparent that there are a multitude of approaches, utilizing different drugs, dosages, time frames, maintenance schedules, administration procedures, environments, requirements of the addicts, and costs, as well as other factors. Exploring each of these details and the efficacy of each variable is beyond the scope of my project, mainly because the review of existing literature found that maintenance as a whole works, and

the lack of implementation lies in these smaller details of treatment, on which policy makers do not agree. It is important to note that, because of this, my meta-analysis does not discriminate between variation on these details, and merely classifies the study as maintenance or not maintenance. Therefore, it will not be able to discern between each variation of maintenance treatment in terms of efficacy.

Upon compilation of the studies to be analyzed, the resulting dataset included 100 studies. Of these 100 studies, four were supply or demand reduction and 96 were harm reduction. Of those 96 harm reduction studies, 12 were classified as not maintenance and 84 were classified as maintenance. Additionally, of the 100 studies total, 80 were deemed to have worked and 20 were deemed to have not worked.

Once the initial list was compiled, coding began. To code the studies, I identified general definitions or criteria for the categories into which I sorted the studies. First, each study was given a unique identification number from 1 to 100. From there, each study was classified as Harm-Reduction or Not Harm-Reduction (and therefore Supply- or Demand- Reduction), receiving either a 1 or 0 respectively. A very basic definition was used to classify the overarching approach. If the study's primary method of treatment, intervention, or technique under study predominantly aimed to reduce the harm associated with heroin use (regardless of if the harm reduction was geared toward the user/addict or the community/society at large), it was classified as harm reduction. Similarly, if the study's primary method of treatment, intervention, or technique under study predominantly aimed to reduce the supply or demand of heroin in an environment (community, society, state, prison setting, etc.), it was classified as supply- or demand-reduction.

The next step of coding was to determine the harm-reduction approach as being maintenance or not maintenance, being coded as 1 or 0 respectively. Of note, is that those studies that were classified as supply- or demand- reduction were automatically coded as a 0 at this stage because a supply- or demand- reduction strategy is, of its own nature, not maintenance. To classify a study as maintenance, it had to meet the following criteria: 1, participants in the study were given a drug in order to substitute for or control their heroin use; 2, the drug was given at a specific dosage at specific intervals, and these dosages and intervals were permitted to vary over the course of treatment; 3, the drug was given under the assumption it would reduce the harm associated with non-managed drug use and/or to maintain the participants' quality of life; and 4, the treatment procedure was not required to aim at reducing the amount of substitution drug over time to reach abstinence, but it could be an included treatment goal.

The final step of coding was to determine if the study worked or did not work. While "worked" and "did not work" are very vague terms, dealing with such a variety of study types and a variety of outcomes meant that setting a more stringent term or classification would be impractical and burdensome. Because each field, approach, and study could have different goals, discerning one specific goal by which to judge such a variety of studies did not seem realistic, especially because I was dealing with a very comprehensive and broad collection of studies. To classify a study as having worked or not worked, I examined three aspects of the study. First, I examined the conclusion and results sections of each study to determine the goal of the study as well as the outcome. I specifically looked for statements indicating the success of the treatment, approach, or technique under study based on its specific goals. Second, I examined comparative

statements of success. In some studies, a variety of maintenance approaches or a variety of supply- or demand- reduction strategies were compared. In those cases, I examined the comparative success of each strategy or variation and looked for statements indicating their relative success to each other and other strategies. Third, I examined each study under a lens of discretion, where I used logic, reason, and rationale to determine whether not only the authors determined the approach to work or not work, but also whether I determined the approach to have worked in the context of the study as well. Of note, is that some studies were excluded in this step of coding if the study was ambiguous in results or if it was equivocal whether the approach “worked” or “did not work”.

Once the coding was completed, several trends became apparent. One of which, the most apparent and the most worrisome, was that the studies were predominantly coded as Harm Reduction-Maintenance-Worked. While this is troubling, the Chi-Square analysis determined that the variance was still enough to draw substantive conclusions through statistical significance. Additionally, the cross tabulation table indicates that for both supply- and demand- reduction approaches and harm-reduction approaches that were not maintenance, more did not work and less did work than if there was no relationship between the type of study and its success. For harm-reduction-maintenance approaches, less did not work and more did work than would have if there was no relationship. The p-value also indicates that the difference between the two is large enough not to be due simply to random error.

#### 4. Chi-Square Analysis

Once the studies were identified and coded, they were analyzed using Chi-Square analysis. This type of analysis was chosen to compare two nominal level variables (the

type of approach and whether it worked or did not) and determine if they are reliably related to or dependent on each other. Because I needed to compare across only two coding categories rather than three, I introduced a breaking variable, combining the first two variables- Supply- or Demand- Reduction versus Harm-Reduction and Maintenance versus Not Maintenance. Therefore, studies that were Supply- or Demand- Reduction (and therefore not maintenance) were coded 0, studies that were Harm-Reduction and not maintenance were coded 1, and studies that were Harm-Reduction and maintenance were coded 2.

Chi Square tests do have some limitations, however, in that it cannot discern the size, strength, or direction of the relationship between two variables, and can instead only determine if the variables are independent of each other or related in some way. Because of this limitation, directional tests were also utilized, including Cramer's V.

### *Issues*

While the Chi Square test was used to determine the presence of a relationship between the type of approach used and the outcome of the study, and therefore to understand the consensus found in the literature regarding effective approaches to heroin use and abuse, understanding the reasons for the lack of implementation despite the consensus is a bit more complicated. Overall, this lack of implementation lies in the issues plaguing the implementation of policy in response to the heroin epidemic. In the case of heroin, the main issue is discrepancies between fields affected by and involved in the heroin problem, including but not limited to the criminal justice, medical, legislative,

political, and economic fields. These differences have their roots in group think and goal conflict, both of which exacerbate the misalignment between fields, making reaching a policy consensus nearly impossible.

### *Groupthink*

The first issue from which the misalignment arises is group think. First presented as a theory in 1971 by Irving Janis, groupthink is “the mode of thinking that persons engage in when concurrence-seeking becomes so dominant in a cohesive ingroup that it tends to override realistic appraisal of alternative courses of action” (Janis 1971, 84). One of the most common norms in the presence of group think is upholding loyalty to the group by maintain the policies to which the group has already committed, even when those policies have unintended consequences or are working out badly. In group decision-making settings, members of the ingroup adopt soft-line criticism of their peers, leaders, and themselves, and conflict rarely occurs in the decision making process. This is not to say, however, that all groups will succumb to the perils of groupthink in their decision making, but rather that any advantages of group decision making are often outweighed due to the psychological pressures of cohesion that arise when members of the ingroup work closely, share values, and face a crisis situation that stresses the normal group decision-making dynamic (Janis 1971).

Janis also proposes his main principle of groupthink, which, based on Parkinson’s Law, states that, “The more amiability and esprit de corps there is among the members of a policy making ingroup, the greater the danger that independent critical thinking will

be replaced by groupthink, which is likely to result in irrational and dehumanizing actions directed against outgroups” (Janis 1971, 85).

Before considering the consequences of groupthink, both as proposed by Janis and as evidenced in dealing with the heroin epidemic, it is also important to note how groupthink is present in the policy-making process in regards to heroin. To begin, the most typical norm of groupthink is “sticking with the policies to which the group has already committed itself, even when those policies are obviously working out badly and have unintended consequences...” (Janis 1971, 84). This is evidenced by not just each field involved in the heroin epidemic, but by the larger American attitude toward dealing with drugs as well. When the “War on Drugs” began, it became the All-American cause to eradicate drug use with a punitive and legislative approach. The group most involved was the bureaucracy, encompassing each and every aspect of policy and every field involved- medical, criminal justice, political, and others, though the main source of groupthink was law enforcement. Law enforcement thinks of all the problems it addresses, including drugs, as law enforcement problems and, since the federal government is typically stronger on law enforcement than health, the main manifestation of groupthink was demonstrated in the policy-making process when loyalty to the “War on Drugs” overshadowed the facts, when they became apparent, that the punitive policies were having negative effects on the criminal justice system, social dynamic, and economy.

Within each field involved in the policy making process and the heroin epidemic, however, groupthink is also apparent. This is due to the strong bond between members of each field; for instance, the bond within groups and associations of medical

professionals, lawyers, judges, police, politicians, pharmaceutical companies, social workers, and other ingroups of parties involved in and affected by the epidemic mean each have a delineated approach toward thinking about and solving the heroin epidemic. Most notably groupthink can be seen in the treatment camp, mostly advocated by medical professionals. It is the smaller of the two spheres and as it is up-and coming rather than previously established, it possesses more of the esprit de corps Janis notes is essential for groupthink to take hold.

### *Goal Conflict*

In addition to groupthink, the second issue which exacerbates the misalignment between fields is that of goal conflict. Conflict, in and of itself, is difficult to define, but within the organizational setting it has its roots in disagreement, contradiction, and incompatibility. Conflict, itself, should be understood as a dynamic process, encompassing a sequence of conflict episodes and relationships where a variety of factors characterize the conditions, affect, perception, and behaviors of the parties involved (Pondy 1967). Additionally, conflict affects productivity, stability, and adaptability of an organization in the way the organization reacts to the disturbed equilibrium brought about by conflict. For goal conflict specifically, the situation is one where desired outcomes appear to be incompatible. In the case of heroin policy, the basic principles of goal conflict are maintained and cause serious issues for reaching a policy consensus. In treating the policy making arena as an organization, these principles can be fleshed out in



how they directly impact the process of making and implementing policy with which to deal with the heroin epidemic.

Within organizations, there are three models that have been designed to classify conflict phenomena. The one most applicable to conflict in making heroin policy is the bargaining model. This model deals with conflict in competition for scarce resources, where there is a discrepancy between the demands of the different parties involved and the available resources. In this case, solving the conflict usually centers around increasing the available resources or decreasing the demands of the parties involved. In these interest-group style conflicts, negotiation faces the problem of reaching a consensus while maintaining both flexibility in dealing with the other parties and rigidity in one's own demands. Additionally, this bargaining model is similar to the budgeting process, where it is an incremental process building on the previously established conflicts and negotiations, but this process faces concealment that attempts to rationalize the decisions being made rather than exposing the bargaining process.

In making policy to deal with the heroin epidemic, goal conflict often falls into this bargaining model. There are scarce resources available for combatting heroin use and addiction, and different fields with different goals are vying for those scarce resources. The criminal justice system, historically at least, advocated for spending limited resources on punitive measures, while the political realm advocated for spending resources on public education campaigns to boost moral and rally societal support around anti-drug legislation. On the other hand, medical fields advocated, and still are, for harm reduction programs including needle exchanges on the public health front, public education, and funding and access for addicts to maintenance programs. Historically, the

bargaining process was more spread out, with many different fields aiming to achieve many different goals, but as of late, this bargaining process has converged on maintenance treatments and harm reduction strategies. This is not to say, however, that there is not still bargaining and allocation of scarce resources to be done; although the goals are less different now, the fields are still at odds about the best way to manage the scarce resources in the most effective and efficient way to achieve their goals.

In considering this model of conflict, it becomes apparent that while there is conflict between the groups, the conflict lies less in the goals and more in the means of achieving those goals. Each field's goal is to solve the problem of heroin use and abuse. That goal, however, takes many different forms: reducing the public harm, reducing the harmfulness of engaging in drug use, increasing public awareness and access to treatment, and, in the past, increasing punitive measures, reducing the supply of the drug, reducing the demand, and increasing anti-drug and drug-control legislation. Today, however, literature in all fields seems to agree on a broad idea that harm reduction through maintenance treatment works. With the unified goal of solving the problem, and the consensus that maintenance treatment works, why is conflict still a problem? L. J. Bourgeois III puts it this way: "Agreement on goals without agreement on means correlates with poor performance."

### *Means Misalignment*

After exploring both groupthink and goal conflict more in depth, it becomes apparent that the general misalignment cited as influencing the policy making process in

dealing with the problem of heroin is more specifically “means misalignment”, where the fields are unable to agree on the means by which to achieve the goal of implementing policy that supports the consensus that maintenance treatment works as an approach to the heroin epidemic. Means misalignment is wherein the problem lies in implementing heroin policy. Because the fields do not agree on the details of the policies, the means by which the general idea behind the policy should be realized, a policy consensus cannot be reached. This, of course, is in spite of the mounting evidence and full bodied literature discussing the merits of maintenance treatments, which exhibits the goal consensus in regard to heroin policy. Having goal consensus, however, is not sufficient for achieving policy consensus, because the details of implementation must be agreed upon as well.

Bourgeois, cited above, acknowledges that human actors are expected to be teleological and goal directed, and that the Western world agrees that the rational way to make a decision is to determine a goal, then identify the means to attain that goal. In his study, however, he compares the strategic planning school and the incremental school to determine how decision making should proceed. In the strategic planning school, decision makers define goals and objectives, form a list of policy alternatives or means, assess the probabilities of consequences for each alternative, make a choice, and then take action on those choices. This school of strategic planning is the traditional and normative approach to decision theory, and it is typically accepted that there should be agreement on policy makers on the goal priorities of the policy. In the incremental school, policy makers look for alternatives until an acceptable solution is found, and the goals and means are adjusted while alternatives are evaluated based on analysis of incremental differences from the status quo. Rather than goals being established before

evaluating alternatives, the goals and means adjust based on what the current situation dictates.

Overall, this presents a juxtaposition of the two orientations- one of goal consensus, where agreeing on the goal will lead to success, and one of means consensus, where agreeing on the means and not the goal is the key to success. Bourgeois ultimately determines in his comparative study that lack of consensus on means is more troublesome to successful policy implementation than disagreement on the ends (goals), and therein lies the issue for successful implementation of heroin policy. Under the assumption that the variations in agreement, whether on goals or means, cause differences in performance, or successful implementation of policy in this case, Bourgeois study supports the idea that the best policy outcomes will arise when the policy making groups agree on means and a narrow range of operable goals, and disagree on the less tangible goals. In the case of heroin policy, the means would be the specific policy or policies to be implemented. The narrow range of operable goals would include goals such as increasing access to maintenance treatment programs by increasing funding, increasing the availability of substitution drugs for addicts, or reducing restrictions on clinicians administering the substitution therapies. The less tangible goals would include ideals such as fixing the heroin epidemic, reducing the number of overdose deaths, or implementing maintenance treatment policy.

Similarly, his results support the notions that: 1, consensus on means always yields higher performance than disagreement on means; 2, allowing disagreement on less tangible goals tends to be associated with better performance; and 3, the worst policy outcomes result when goals agreement occurs with means disagreement. In this way,

disagreement on the means may hurt the implementation of policy because the strategies of the different groups involved clash, “causing muddled and internally inconsistent or incomplete strategies” (Bourgeois 1980, 244). The situation with heroin policy in America is accurately described by the third notion- there is definite goals agreement on all the fields and parties involved in the policy-making arena, where they all agree that the epidemic would be best resolved through implementation of policy focused on harm-reduction maintenance treatment, but the disagreement arises when considering the means by which to implement that policy directive. Between the different dosages, time frames, environments, administration procedures, costs, and other factors involved in maintenance treatment, there is much to be decided upon when it comes to establishing the means to reach the goal. Therefore, it is these policy details, the specific means, that hinder implementation of policy. According to Bourgeois’ typology, reaching a policy consensus would benefit from the parties involved agreeing on the means by which to achieve the goal of solving the heroin epidemic, and allowing for disagreement on the less tangible goals, such as the ideals listed above, would allow for better policy outcomes as well.

Means misalignment is exacerbated by both groupthink and goal conflict. Groupthink, as an issue, affects means misalignment in the group’s perspective on the means by which the goal should be achieved. As described, because of groupthink, each field is cemented in its own set of means geared toward the fields tangible subset of goals that fall within the widely agreed-upon goal to implement policy that supports maintenance treatment to deal with the heroin epidemic. Groupthink is what keeps the fields from negotiating on the details of implementing policy, the means. Each field has

a subset of goals and its own “best” way of achieving these goals within the larger framework of the consensus exhibited by the literature. Because the fields are approaching the issue as an ingroup under the influence of groupthink, they do not approach policy making unencumbered by their own preconceived perspectives. Rather, they approach them with reduced realistic evaluation of the alternative sets of means being presented and are often irrational in their avoidance of information that contradicts their set point of view, which makes negotiation between the fields nearly impossible.

Goal conflict, the second issue exacerbating means misalignment, has a more straightforward relationship with means misalignment. It is not focused on the broad goal that the fields agree on- that of implementing maintenance treatment policy. The goal conflict in this situation is instead on what Bourgeois describes as the tangible goals, the subset of more specific and concrete goals that each field diverges on. Because of this divergence on exactly what the goal is under the umbrella of solving the problem of drug use and abuse, the fields have different means for achieving those goals, and without agreement on the means, a policy consensus will not be reached.

In answering the question of why, in the face of mounting evidence in favor of maintenance treatment approaches to heroin, there is a lack of policy consensus and implementation, exploring the root issues of groupthink and goal conflict, as well as the ultimate means misalignment between fields, goes far to address the lacking implementation of policy in response to the heroin epidemic. It is not the broad goal of eradicating the problem of heroin use and abuse that limits policy consensus. Instead, it is the misalignment on the means by which the policy goal should be achieved, the details of the policy’s execution, that hinders implementation. With groupthink limiting the

capacity of the fields to attempt negotiations due to the fields being unwilling to relinquish commitment to their unique point of view and goal conflict between the fields' specific subsets of goals influencing the different means by which the fields favor achieving those goals, means misalignment is at the heart of lacking policy consensus and implementation in solving the heroin epidemic.

### *Methodological Concerns*

As with any study, a variety of methodological concerns and issues of data collection and analysis were found throughout the project. Many of these concerns have their roots in the issues cited above, and while some were addressed as best as possible given the circumstances of the study and available resources, some concerns were had due to the nature of this specific study and merit heeding. Along with issues associated with the type of study being a meta-analysis, this specific study had four main issues that were more specific to the circumstances of this particular project: lacking variation in data, drop out rates, selection bias, and concerns of special populations and ethics.

The first set of issues and limitations arises simply from the nature of the meta-analysis. Although meta-analyses are used in many disciplines to incorporate findings from many studies, the meta-analysis itself remains controversial due to the use of dissimilar studies, publication bias, and inclusion of poor quality studies. In many meta-analyses, the researchers define the subject so broadly that studies are often compiled into a data set with disregard for important differences between the studies that would warrant them incomparable. In this meta-analysis, it is clear that the subject is defined very

broadly, but this broadness plays into the broad scope of the research question itself- what is the consensus of literature on combatting the heroin epidemic? Without a team of researchers to peruse abstracts or abstract-scanning software, however, it is quite possible that some very distinct studies were included in the data set, especially because the inclusion criteria were not overly restrictive. Presumably, the studies themselves are similar enough to determine an outcome for coding that would not discredit the merit of this meta-analysis.

Publication bias, which will also be discussed within the issues associated with this specific meta-analysis, arises due to the fact there exists a bias toward publishing studies with statistically significant results, leaving many studies with insignificant or negative results unpublished. While a non-result or weak result are still results, they are not the kind that get published. This likely leads to a biased sample of studies and overestimation of the effects of what is being studied. Once again, lacking resources meant I was unable to identify or include unpublished studies, which limits how far this project could go in mitigating the effects of publication bias, but, based on the circumstances of data collection and goals of this project, the methods suffice.

A final limitation of general use of a meta-analysis is that of including poor quality studies. While the inclusion criteria for this project did not include any formal methodological quality controls, soft screening practices for each study were utilized to ensure that the studies included in this analysis possessed a basic level of methodological merit. It is quite possible that studies that were not methodologically sound were included in this analysis, but no study is completely free from weaknesses in methodology and judging the strength of each study would have been cumbersome and



may have introduced bias from the criteria assessing quality. It is assumed, however, that the studies included in this analysis were reviewed by their respective publishers with care enough that any study prompting serious concern would not have been published in the first place, and therefore would have been excluded preventively.

The second set of issues are related more to the specifics of this project than general limitations of conducting a meta-analysis. First, the data set was lacking in variation. 96% of the studies included in the data set were harm reduction, and 87.5% of those harm reduction studies were classified as maintenance studies. Clearly, the majority of the studies included were harm reduction maintenance studies and, further, 86.9% of these studies were classified as having worked. This bias in the literature could be due to a few things. For one, groupthink, as explored earlier, discourages novel information from being presented and discussed within fields. Because of this, if the group assumes the majority convention that harm reduction, maintenance treatments work, that is the literature that will be accepted, discussed, and presented as fact, simply because the group does not acknowledge conflicting information. Additionally, publication bias comes into play here just as it does with general meta-analyses. I used the available literature to compile my data set, and the available literature is what was able to get published. In academia, those studies that do not work do not get published. This introduces a bias towards studies working, which means that when publication bias is combined with groupthink bias, this meta analysis was swayed toward overestimating the success of the approach favored under groupthink.

The second issue unique to this study is that of high drop out rates. When investigating the literature and, more specifically, the studies included in this dataset, a

recurring methodological concern was drop out rates. Many of the studies were of a small-n to begin with, so having even only a few subjects drop out of the study meant the validity of the study could be called into question, simply because the sample may have lost representativeness. When considering the subject matter of this project and the studies on which it is based, it becomes a question of if the approach deemed to be “most successful”, in this case maintenance treatments, is only successful because those for whom it is not successful drop out of the study, leaving only subjects for whom the approach achieved the goal in the end. This could easily inflate the successful outcome of studies. Moreover, when it comes to drug use and approaches, if the approach is not working (whether this sense of success is felt by the subject/patient or the researcher) the subject will either drop out by their own choice because continuing with an ineffective approach is irrational or drop out due to mortality, the drug use or comorbidity taking their life. Therefore, those for whom the approach did not work were not present at the conclusion of the study for their negative results to be included. If only successful participants remain at the end, the results will be skewed toward success.

Third, selection bias was an additional limitation of this project. Without abstract screening software or even a second set of eyes to review or challenge my own coding, it is quite possible that some of the studies included should not have been or, when coded, were coded incorrectly. When dealing with such an abstract subject, however, there is bound to be some discretionary error. The preconceived notions with which I was evaluating these studies are different than those of other researchers, and are additionally different than the biases applied by a computer program. Because of this, selection bias and natural human error are concerns to be had in evaluating the methods of this study.

The fourth and final limitation of this project is that of dealing with ethics and concerns in dealing with special populations. The nature of heroin use is that it is not only illegal, but also socially condemned and a sensitive topic of discussion. Within the history of heroin, treatment approaches were often experimented with in a prison setting, and while there are now guiding ethical standards that deem much of that experimentation taboo, utilizing special populations of prisoners or corrections populations in drug use studies is not uncommon. This is mostly due to the fact that it is difficult to find heroin users who are willing to step forward, admit their illicit behaviors, and submit themselves to research. Utilizing corrections populations means that they have already been convicted, their drug use being known, and that incentives can be offered to encourage participation.

This, of course, lends itself to ethical concerns of coercion, but also to concerns of selection bias, sampling bias, and skewing of results. With ulterior motives for participation coupled with motives for showing the approach to be successful, the results of studies using corrections populations lack validity. There is also a question of the representativeness of the sample being used because there may be other variables linking the type of prisoner that self selects into participating or motivations of prisoners to success in different approaches. Related to this idea is motivation, on which few studies report data. Motivation for not only participating but also being successful in the treatment goals may be important in explaining the differences between subjects and their success. While studies must go through Institutional Review Boards and are reviewed before publication for being methodologically sound, it is still possible that motivation

and sampling were prodigious issues in the studies utilized in this project's data set, and therefore influenced this project as well.

Keeping in mind these issues and limitations of not only general meta-analyses, but also of this specific project, it is notable that no study is perfect in its methods. Meta-analyses themselves, however, are a secondary analysis technique, and are therefore subject to the weaknesses of the studies which they employ. The generalizability of meta-analyses is limited to the state and scope of the literature on which it is founded. In this case, the research question examined the consensus of the literature on approaches to the heroin epidemic, so using the available literature and relying on its characteristics is acceptable, but any results or conclusions of this analysis should still be understood within the context of the issues presented here.

### *Analysis*

This project is a meta-analysis of 100 quantitative studies regarding approaches to heroin addiction and abuse with the goal of addressing the question, "What is the consensus of the literature in regard to heroin policy?" Besides the standard descriptive statistics, cross tabulation tables were used to explore any patterns in the literature and Pearson's Chi Square and Craver's V statistics were also used to quantify the relationship between variables.

To begin, summary statistics were used to get a feel for the distribution of the data, which can be seen in Table 1. Each observation was evaluated on three dichotomous variables: as a harm reduction approach, as a maintenance approach, and if

it worked, where positive answers to these variables were given a 1 and negative answers were given a 0. Additionally, a breaking variable was created using the data from the first two variables that coded each observation on a scale of 0 to 2 based on the amount of maintenance involvement. Those that received zeroes across the board were coded zero on this breaking variable as not harm reduction and therefore not maintenance. Those receiving a one were harm reduction, but not maintenance and those receiving a two were harm reduction and maintenance.

Table 1: Summary Statistics of Each Variable

<b>Variable</b>	<b>n =</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Min</b>	<b>Max</b>
Harm Reduction	100	.96	.197	0	1
Maintenance	100	.84	.368	0	1
Worked	100	.8	.402	0	1
Treatment (0-2)	100	1.8	.492	0	2

Although the statistics indicate that the data was skewed toward maintenance approaches, this does not necessarily denote a problem with the data or its collection. Rather, it indicates that there is a gap in the literature surrounding supply reduction approaches.

The cross-tabulation table, Table 2, explains much of the story to be told by the literature by allowing for the examination of if there is a relationship between variables, or if one is dependent on (or if not, independent of) the other. It displays the observed and expected frequencies of each type of case, comparing if the variable worked (or did not work) with the type of approach used (on the ordinal breaking variable) where the first row shows studies whose approach of interest did not work, and the second shows those that did. The rows indicated by “expected” contain the number of cases that should fall into that category based on the sample if there were no relationship between the type of approach and if it worked. The rows indicated by “observed” contain the number of cases from the sample that actually fell into the category.

For supply reduction, more did not work and less did work than would be expected if there was no relationship between the approach and its success. For harm reduction approaches that were not maintenance approaches, more did not work and less did work than could be expected, similar to the supply reduction category. For harm reduction approaches that were maintenance, less did not work and more did work than could be expected if there existed no relationship between the approach and its success. Overall, the evidence in these compared frequencies displays a relationship between the type of approach and the outcome of the study.

Table 2: Cross Tabulation Table Comparing Outcome of the Study and the Approach Utilized

<b>Outcome</b>	<b>Supply Reduction</b>	<b>Harm Reduction Not Maintenance</b>	<b>Harm Reduction Maintenance</b>	<b>Total</b>
<b>0 – Didn't Work</b>				
<i>Observed</i>	4	5	11	20
<i>Expected</i>	0.8	2.4	16.8	20
<b>1 – Worked</b>				
<i>Observed</i>	0	7	73	80
<i>Expected</i>	3.2	9.6	67.2	80
<b>Total</b>	4	12	84	100

$$X^2 = 22.0238, p = < .001$$

$$\text{Cramer's } V = .4693, p = < .001$$

This table displays a potential relationship between these two variables that is confirmed by both the Chi Square and Cramer's V statistic.

While the cross tabulation table alone indicates a potential relationship between the two variables, where the approach used in the study is related to the outcome of the study, statistical tests can provide an opportunity for inferences to be made about the population. Running a Pearson's Chi Square Test for Independence yielded a  $X^2$  statistic of 22.0238 (p-value < .001). While this number does not indicate strength or direction of the relationship, nor that one variable causes the variation in the other, it does allow for

the conclusion that there is a significant relationship between the two variables in the literature.

A Cramer's V Measure of Association was also run to determine the strength of the relationship between approach and outcome, yielding a result of .4693 (p-value < .001). This indicates a moderately strong, and nearly very strong, relationship between what approach is used and the outcome of the approach, where the more maintenance-focused an approach is, the more likely it is to work.

Upon evaluation of the cross tabulation table and the Chi Squared and Cramer's V statistics, it can be concluded that there is a relationship between the approach used and the outcome of using that approach, where maintenance approaches are more likely to work than harm reduction strategies that are not maintenance and, subsequently, supply reduction strategies. Based on this assessment, where the units of analysis are pieces of literature regarding approaches to heroin addiction and abuse, the consensus of literature can be interpreted to be that maintenance approaches work in addressing the problem of heroin.

### *Discussion*

Statistical analysis on its own only tells part of the story. What are the implications of the results? The analysis confirmed that there is a relationship between the approach used and the outcome of using that approach, where the more maintenance-focused approaches are shown to be the most effective compared to other harm-reduction and supply- and demand- reduction strategies. In this way, the literature has an

established consensus that maintenance treatments work in addressing the problem of heroin, but understanding and applying that consensus must be considered in light of caveats discussed regarding data collection.

The first concern is of the lack variation in the data. There is a gap in the literature, as evidenced by the lack of criminal justice studies focusing on supply and demand reduction strategies, that may be brought on by groupthink, where information that contradicts the ingroup's accepted thought pattern is neither presented nor discussed. Similarly, the lack of criminal justice research on the topic could be due to ethical concerns in dealing with the special population of prisoners. That subgroup of the population is not easy to study due to issues of coercion and bias, and studies that are geared toward studying prison populations are not generalizable to the public, which limits the conclusions that can be drawn based on criminal justice research of this type and further makes publication of such studies difficult.

The second concern is the issue of high drop out rates. The recurring methodological concern of dropout rates in the studies used in this analysis indicates that saying "maintenance works" may not divulge the entire picture. Rather, a more accurate interpretation of the results of the analysis in light of the dropout rates is that maintenance treatments act as a screening mechanism. Because those for whom maintenance treatments do not work typically drop out of the study or are excluded in other ways (death, for example), the subjects left at the end of the study are those for whom the treatment worked, inflating the success of the approach. In this way, it becomes apparent that maintenance approaches, arguably more involved than other approaches, require a



certain motivation for success that the other strategies do not, meaning that maintenance treatments work for those who want them to work.

Even with these concerns in mind, the consensus of the literature was confirmed, and the question still remains as to why policy is not being implemented in line with what the literature supports. In looking back at the history of heroin, part of this lack of policy may lie in the methods used over time in dealing with addiction. The effects of the methods used can be seen in the dichotomy between the European, specifically British, approach and the American approach. On the one hand, England has approached addiction through treatment, with a uniquely medical perspective, focusing on Harm Reduction on the treatment side with emphasis on the addicted individual. On the other hand, the United States approached addiction with an emphasis on punitive and prohibitive methods, allowing the criminal justice system and crime-control perspectives to lead the charge with a focus on supply and demand reduction through legislative action. This focus meant the complex legislative process hindered implementation of effective policy because, rather than a unified goal of treatment, the country was tasked with integrating the goals of the many fields involved into a cohesive policy, which has been proven to be nearly impossible.

That is where this analysis comes in; the consensus has been reached in the literature that maintenance works, but it is the details of implementing the maintenance treatment programs that cause the disagreement. Policy implementation has been hindered by both goal conflict and group think, both of which exacerbate the means misalignment between fields and make reaching a consensus on the appropriate policy difficult. All the parties involved recognize that there is an issue that can be resolved by

maintenance treatments, and this is demonstrated by the analysis in this project. However, the fields do not agree on the details of the policy, the best way to achieve success with maintenance treatments. It is not the goal of eliminating heroin use and abuse that limits policy, rather it is the misalignment on the means by which the policy goal should be achieved, the details, that hinder implementation. History is history, however, and America has faced, and will continue to face, many difficulties in implementing policy to deal with the heroin epidemic successfully, but that is not to say that a solution is impossible.

In light of the issues of this study and thoughts regarding why policy is not being implemented despite the consensus of the literature, the story told by the analysis in this project is made more complete. By considering the gap in criminal justice literature and the effects of dropout rates, the conclusion drawn from the analysis is that maintenance works for those who want it to work. Coupled with the idea that it is the details of implementation that delay policy, rather than the broad consensus that maintenance approaches are effective in dealing with heroin use and abuse, the United States needs to address the issue of consensus by not getting caught up in the details and language of the issue and, instead, focus on broad legislation where the details of implementation can be worked out based on each community's unique situation, the demand for services, and in seeking to use resources in the most effective and efficient manner.

Moving forward, further research should be done to investigate the characteristics of those individuals for whom maintenance treatments are successful, to determine for what sub-population of addicts maintenance treatments work the best, and to investigate if motivation plays a role in the success of both maintenance approaches and other

approaches to addressing addiction. Additionally, country comparisons to discern additional ways in which the government systems affect the formulation and implementation of drug policy and examining the successes of different approaches internationally could impact the way the United States approaches drug policy formulation and implementation.

### *Conclusion*

This project aimed to aid legislators by presenting quantitative evidence on what policies existing literature supports as working in dealing with the problem of heroin use in order to shift policies to a more effective approach. In doing so, it sought to address the question of why, in the face of a seemingly present consensus within the literature, policy is not being implemented. Upon review and coding of 100 quantitative outcome evaluations of heroin abuse treatment programs or specific techniques, the Chi Square analysis, associated cross tabulation table, and Cramer's V Measure of Association indicated that there is a relationship between the approach used and the outcome of the approach, where maintenance approaches are more likely to work than harm reduction strategies and, subsequently, supply reduction strategies.

While there were limitations in the data collection methods used and caveats including lacking variation in the data and high drop out rates, the results can be interpreted to show a consensus in literature that maintenance approaches work in addressing the problem of heroin. With this consensus, it is expected that policy would be implemented following the literature, but that is not the case. Examining the methods

used over time in dealing with addiction, along with the presence of goal conflict and groupthink exacerbating the means misalignment between fields, offers a probable explanation for the difficulties legislators face in reaching a policy consensus, and therefore in implementing effective policy. The study concluded that, while the literature finds consensus on the idea that “maintenance works”, the details of implementation cause disagreement between fields; overall, maintenance approaches work for those who want it to work, and policy makers should focus on implementing broad legislation where the details of implementation can be worked out based on each community’s unique situation, the demand for services, and in seeking to use resources in the most effective and efficient manner.

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