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From Streets to Stats: A Statistical Analysis of the Quantity of Illegal Narcotics Seized in the United States

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By Zachary Strickland

Introduction

In this dataset, comprising narcotic and drug statistics there is a diverse array of seized illegal drugs and prescription medications collected from eighteen states across the nation over a span of four years. Many puzzling questions arise from the seizure of a drug. Why do some states seize more illegal narcotics than others? Is there a specific, consistent factor that leads to more narcotics seized? From where are these drugs coming from? Do these narcotics affect the safety of states or communities? This study specifically analyzes the drugs / narcotics seized by law enforcement agencies from eighteen states across the United States.

The research question is: "What factors impact the quantity of illegal narcotics seized across America?" This question interests me for many reasons, specifically because of the apparent rise in fentanyl deaths across America. Although this research proposal covers many types of illegal narcotics, the recent rise in fentanyl deaths sparked me to further analyze and research how states can make their communities safer for their citizens. I also plan to discover how states can increase their total seizures of narcotics.

A drug is defined as "any chemical substance that causes a change in an organism's physiology or psychology when used."[1] Drugs are classified by many factors, specifically the legality of each substance. There are a variety of drugs that are utilized legally, such as prescription medications with the healthcare system. However, legal drugs are often abused in an illegal manner, such as the diversion of prescription medications. There are also a variety of illegal drugs, also known as

[1] "Drug Abuse," *International Online Medical Council,* Accessed April 20, 2023. https://www.iomcworld.org/medical-journals/drug-abuse-54986.html#:~:text=A%20drug%20is%20any%20substance,substances%20that%20provide%20nutritional%20support.

narcotics. A narcotic is "a drug or other substance that affects mood or behavior and is used for nonmedical purposes."[2] This study presents of an analysis of the quantity of illicit narcotics / drugs seized across the United States, measuring the number of total drugs seized across different agencies in a variety of states over a multi-year span. My dependent variable is the quantity of illegal narcotics seized across the United States.

This research is important because, over time, there is a significant increase in overdose deaths from drugs, as a whole. This research potentially answers questions as to why some cities have more drugs than others. The results of this research could give law enforcement fresh ideas on how to further combat the war on drugs and make America a safer space.

An analysis of a variety of U.S. states are listed in the following: border states, coastal states, landlocked states, Republican and Democratic states, richer and poorer states, and states that have or have not legalized recreational marijuana. I analyze seven independent variables and how they relate to my dependent variable. I aim to discover that my independent variables have a direct relationship to my dependent variable.

I first highlight multiple scholarly works that discuss the basics of my topic and how some independent variables relate to my dependent variable. I then introduce each of my independent variables and predict their relationship with my dependent variable in the theory section. After, I analyze the data and discuss what each relationship means, and I review the theory section. Finally, I summarize everything I talked about and discuss shortcomings that I encountered while conducting my research.

Literature Review

Many components factor into the quantity of illegal narcotics seized across the nation. I highlight multiple scholarly works that discuss why my research question is important. I also identify what else could factor into the quantity of illegal narcotics seized across the states in my study.

The first piece of literature that expands the idea of my research is Richard Isralowitz and Juann M. Watson's book titled "Illicit Drugs."

[2] "Narcotic Definition," *Google,* Accessed April 20, 2023.

Isralowitz and Watson explain to the reader what an illicit drug is, how drugs are dangerous to the person using them and to the community around them. The authors state, "Drugs destroy lives and communities, undermine sustainable human development and generate crime."[3] Isralowitz and Watson continue to describe how bad the usage of drugs is for everybody, and overall, they provide a comprehensive portrayal of the negative aspects of drugs.

It is well known that illegal drugs ruin communities and that they need to be combatted; however, "Illicit Drugs" does not give readers an idea on how to combat them. Yet, this piece is important to my study because it helps define a major part of my dependent variable I study.

The second piece of literature that informs my research is "Drug Enforcement in The United States: History, Policy, And Trends" written by Lisa Sacco. In this piece, Sacco discusses the history of drug enforcement in the United States extensively. She states that most drug related crimes are dealt with at the state level; however, the Drug Enforcement Administration (DEA) assists in a majority of the cases.[4] She also states that over time, the federal government's plans on drug enforcement have moved their emphasis toward reducing drug supply, noting that about 60% of the federal drug control spending is spent on supply reduction.[5] This fact highlights my research idea because if the federal government is spending a majority of its money in efforts to reduce drug supply, then the number of drugs on the streets will decrease, thereby, decreasing the total amount of drugs that can be seized by law enforcement.

My project contributes to Sacco's work because she provides statistics regarding drug offense arrests, and my research will take a deeper look into these drug offenses and discover the quantity of drugs seized in these cases. Sacco states that in 2012, state and local police arrested 1,328,457 suspects for drug offenses. However, she does not mention the total number of drugs seized from the arrests.[6] My research

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[3] Richard Isralowitz, and Juann M. Watson, "Background," in *Illicit Drugs,* (Santa Barbara, 2011) 3.

[4] Lisa Sacco, "Drug Enforcement in the United States: History, Policy, and Trends," *Journal of Drug Addiction, Education, and Eradication,* Vol. 10, No. 4, 415-441, 2014.

[5] Sacco, "Drug Enforcement in the United States."

[6] Sacco, "Drug Enforcement in the United States."

answers this in some states and will take a closer look into the question and discover reasons why more drugs are seized in some areas. Overall, Sacco gives quality information regarding law enforcement's handling of drug offenses, and it is crucial to my research.

In opposition to Sacco, Jeffrey Miron's professional study titled "Violence, Guns, and Drugs: A Cross-Country Analysis," discusses a different topic in a reverse order of my study. He discusses how different factors affect rates of violence across the country. One of the specific factors included is drug prohibition enforcement.[7] This article suggests that there is an important difference in rates of violence across countries because of the differences in drug enforcement prohibition. It also suggests that violence in America is not because of loose gun restrictions but because of the increase of drug enforcement prohibition.[8] This research provides another element to my study by suggesting that the increase of drug laws encourages the ownership of guns for citizens who are participating in the sale of illicit drugs.[9] My research will look at the prohibition of drugs through one of my independent variables which, ultimately, will contribute to Miron's research.

Sacco's research claims that we are trying to reduce the drug problem at the supply stage of narcotic distribution. Miron's study shows that an increase of drug laws makes violent crime rise throughout the United States. These two pieces of literature are interesting to compare, and Miron's idea is difficult for me to understand when the drugs he discusses are illegal, mind-altering, and dangerous. However, both are still important literature to discuss.

The next piece of literature was written in 1977, making the research much older compared to the other research articles in my study. However, the author's argument has become true for many states in my study. John Helmer's "The Connection between Narcotics and Crime," is an article in which Helmer argues that narcotics should be decriminalized. He specifies which states should decriminalize narcotics in order to break the connection between narcotics and crime.[10] Helmer

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[7] Jeffrey A. Miron, "Violence, Guns, and Drugs: A Cross Country Analysis," *The Journal of Law and Economics* v 44, No. S2, 615-633.

[8] Miron, "Violence, Guns, and Drugs."

[9] Miron, "Violence, Guns, and Drugs."

[10] John Helmer, "The Connection between Narcotics and Crime," *Journal of Drug Issues;* Thousand Oaks, Vol. 7, No. 4, 405-418, October 1977.

argues that law enforcement has never done anything to combat illegal narcotics and it is fighting an unwinnable battle. He claims the "very worst" way to respond is to expand police measures to combat drugs and "intensify sanctions" against drug users.[11]

This is important to my research because in 2020, Oregon became the first state to decriminalize all narcotics, including drugs like heroin, LSD, and pain killers.[12] Oregon is included in my study as one of the eighteen states. I suggest that my study will help bring Helmer's article into today's world and see how it lives up to the differences in societies. Many states have legalized recreational use of marijuana, believing it to be a less dangerous drug, which has made room for more powerful drugs, like opioids, to enter.

"The New Opium War: A National Emergency" written by Celina B. Realuyo is an article that discusses the newest, most concerning problem in the drug world: opioids. Realuyo defines opioids as synthetic drugs including heroin, methamphetamine, and fentanyl.[13] This holds significance for my research because one of the independent variables in my study looks at overdose deaths. The American Hospital Association confirmed that in 2020-2021 the United States recorded a new record in overdose deaths, 65% of which were caused by opioids.[14] My study is from 2019-2022, so it includes the year the overdose death record was broken. Realuyo's article was published in 2019, one year prior to the overdose record breaking. This article is important because it highlights how addictive and dangerous opioids are, and since the drug trade is such a big factor around the world, Realuyo states that "this crisis is adversely impacting public health, social welfare, the economy, and the national security of the United States."[15] Drugs, as a whole, have a strong effect around the world, and the amount coming into the United

[11] Helmer, "The Connection."

[12] Kellen Russonniello, "Decriminalization of drug possession in Oregon: Analysis and early lessons" *Drug Science, Policy and Law*, April 6, 2023.

[13] Celina B. Realuyo, "The New Opium War: A National Emergency," *Prism*, Security in the Western Hemisphere, Vol. 8, No.1, 132-142, 2019.

[14] "Fentanyl and the Evolution of the Opioid Epidemic," *American Hospital Association*, May 24, 2022.

[15] "Fentanyl and the Evolution of the Opioid Epidemic," *American Hospital Association*, May 24, 2022, pg. 2.

States affects my study in different ways. Realuyo's title 'A National Emergency' demonstrates why my research is so critical at this time.

The next important piece of literature comes from Molly McConville. Her journal article titled "A Global War on Drugs: Why the United States should support the prosecution of drug traffickers in the international criminal court" discusses many factors regarding my dependent variable. She emphasizes many important pieces of evidence throughout the article. First, McConville gives readers an idea from where the drugs are coming in the United States, and almost all of them are coming from our borders. However, it is most important to note that international drug trafficking is a $500 billion a year organization.[16]

This article is important to my research because I study the GDP of each state and these illegal narcotic trades are not accounted into the GDP of each state. This article gives additional information on drugs as a whole, and where they come from, both of which are important pieces of information for my study.

My final article is titled the "Association Between Law Enforcement Seizures of Illicit Drugs and Drug Overdose Deaths Involving Cocaine and Methamphetamine, Ohio 2014-2019." This article consists of an individual state study on the relation between my dependent variable and one of my independent variables. The biggest takeaway from this study is that when illicitly manufactured fentanyl was involved, overdoses were "extremely high."[17] This article is important because it demonstrates how dangerous drugs are, emphasizing opioids once again.

There are many limitations in the literature on this topic that my research fills. To the best of my knowledge, there has been no research conducted in an attempt to discover if anything affects the total quantity of illegal narcotics seized across different states. There are some articles that will compare relationships between drug seizures and drug

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[16] Molly McConville, "A global war on drugs: Why the United States should support the prosecution of drug traffickers in the international criminal court," *The American Criminal Law Review*, Vol. 37, No. 1, 2000.

[17] Jon E Zibbell, Sarah Clarke, Alex Kral, Nicholas Richardson, Denniz Cauchon, and Arnie Aldridge, "Association between law enforcement seizures of illicit drugs and drug overdose deaths involving cocaine and methamphetamine, Ohio, 2014-2019," *Drug and alcohol Dependence,* vol 232, 2022.

overdoses, but none found striving to figure out if there is anything law enforcement can do in effort to seize more.

Theory

Each of the independent variables are chosen because they impact the quantity of illegal narcotics seized within a specific state. My independent variables include the following: the state's total number of overdose deaths, the state's estimated total population, whether a state has legalized recreational marijuana, the state's Gross Domestic Product, whether the state is a border state, the state's political party affiliation, and whether the state is landlocked. I posit the strongest correlation to my dependent variable is the total number of overdose deaths. Each variable is important to my study and I theorize that a combination of them explains why some states seize more narcotics than others.

Drug overdose deaths are a serious problem throughout the United States and have been on a steady increase since the rise of fentanyl in the middle of the 2010's.[18] The increase in overdose deaths relates to many things. First, drugs are a serious problem, because for many drugs, a growing season is no longer a factor, as they are made in a lab. Drugs like marijuana and heroin have seasons where they are grown; however, unlike marijuana, heroin is not natural on its own. Heroin is cultivated from morphine which is a natural substance taken from poppy plants.[19] Ultimately, the creation of synthetic drugs means that drugs are produced 24/7, 365 days a year, with no seasonal break. These synthetic drugs are more accessible, cheaper, and stronger than any natural substance.

Second, the potency of these drugs are 50 to 100 times stronger than morphine, so users can become hooked very quickly. [20] A lethal dose of fentanyl is two milligrams and when drug traffickers create

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[18] Lindsay Lui, "History of the Opioid Epidemic," *Poison Control.* https://www.poison.org/articles/opioid-epidemic-history-and-prescribing-patterns-182#:~:text=The%20third%20wave%20of%20the,from%20fentanyl%20and%20related%20drugs.

[19] "Heroin Drug Facts," *National Institute on Drug Abuse,* https://nida.nih.gov/publications/drugfacts/heroin

[20] "5 things everyone should know about fentanyl," *University of Colorado Boulder, Health and Wellness Service,* Sept 21, 2023, https://www.colorado.edu/health/blog/fentanyl

counterfeit opioids, they do not measure how much they are using. [21] The creation of this cheaply manufactured drug (fentanyl) has caused overdose deaths and the seizure of narcotics to increase.

The recent rise in overdose deaths caused by fentanyl also explains the rise in illegal narcotics seized across the nation. I assert that there is a positive relationship between the total number of overdose deaths in a state and the quantity of illegal narcotics seized. Unfortunately, people overdose; however, the crime is still reported. The first thing law enforcement does after taking care of the body is seize any narcotics in their possession. Since drugs are more available and potent than before, I theorize this causes the quantity seized to grow quickly. The combination of production, accessibility, and potency are major factors to the increase in the quantity of narcotics seized.

$H1_a$: States with a higher total number of overdose deaths have a higher quantity of illegal narcotics seized.

$H1_o$: Total overdose deaths have no relationship with the quantity of illegal narcotics seized.

A state's total estimated population factors into the total quantity of illegal narcotics seized in a state. I assert that the state's estimated population has a positive correlation to the quantity of illegal narcotics seized in the state. When there are more people in a state, there is a higher likelihood that there are more potential drug users. Hypothetically, if on average two percent of the United States population uses drugs, that two percent is a larger number in California than in Montana based on population. Of course, there are other factors as well, but more people mean more potential drug users.

Another factor with population is that drug traffickers, while not choosing the smartest profession, are actually extremely smart. Often, their main concern is money, so they are going to traffic drugs to states and cities with higher populations, and therefore, more money. When drugs are sent to a certain place more frequently, it increases the likelihood of drug seizures. With more drugs trafficking to higher populated areas, more drugs are seized because there are more drugs available.

$H2_a$: States with a larger estimated population have a higher quantity of illegal narcotics seized.

[21] "5 things," *University of Colorado.*

$H2_o$: Estimated population has no relationship with the quantity of illegal narcotics seized.

Marijuana is a narcotic that is used daily by many Americans and is a sensitive subject around the United States. Many consider marijuana not to be harmful. However, marijuana fits every part of the narcotic definition. Regardless of the discrepancies in opinions, it is something that alters your mind and mood; therefore, it is considered illegal by the federal government. However, many states legalized both medical and recreational marijuana use. This makes it difficult to regulate marijuana use because in some states people may be smoking it on the street, while in others, that same activity would be punishable under state law. This is a very important independent variable to my study, and I posit that if states have legalized recreational marijuana, it will have a negative impact on the quantity of illegal narcotics seized in that state.

In 2022, the most commonly seized drug by the Drug Enforcement Administration (DEA) was cannabis, also known as marijuana. They seized 415,675 pounds of cannabis across the nation, over 100,000 pounds more than the next closest drug.[22] When marijuana is legal in a state, I suggest that there is a negative relationship to the quantity of illegal narcotics seized. This correlation is because when the most seized drug across the nation is no longer available to seize by the state level law enforcement, and they work with federal law enforcement agencies, they, too, do not seize as much of it. It is also important to note that, in order for federal law enforcement to prosecute an individual, that individual has to be in possession of 100 kg (over 220 pounds) of marijuana. [23] Therefore, whenever state law enforcement is not seizing marijuana because it is legal, and federal law enforcement does not deal with anything less than 100 kg of it, the total quantity of seizures is down.

Another reason why there is a negative relationship between the two is because of the ready availability of marijuana. It is the most-

[22] Special Agent Colin Strickland, Through DEA Presentation, October 13, 2023.

[23] "Federal Mandatory Minimum Drug Sentences: 21 U.S.C & 841," *Families Against Mandatory Minimums. https://famm.org/wp-content/uploads/Chart-841-Fed-Drug-MMs.pdf*

seized drug across the nation because someone who wants marijuana can find it easier than, for example, someone finding methamphetamine. When the ability to seize marijuana is gone, the total quantity of seized narcotics falls. There is a possibility of a positive relationship that comes from the fact that marijuana is a gateway drug, causing users to chase a stronger high because marijuana is legally obtainable. However, the availability of marijuana outweighs the fact that it is a gateway drug.

$H3_a$: States who have legalized recreational use of marijuana have a lower quantity of illegal narcotics seized.

$H3_o$: Whether a state has legalized recreational marijuana has no effect on the quantity of illegal narcotics seized.

Gross Domestic Product (GDP) is defined as the sum of consumption, investment, government spending, and net exports. The GDP of a state is constantly changing and, generally, a higher GDP represents that a state is doing better economically. I assert that when a state has a higher GDP, there is a higher total quantity of illegal narcotics seized. The correlation between the two is because states with higher GDPs have more resources, meaning they can spend more money on law enforcement, drug combatant programs, and rehabilitation centers to help fight the war on drugs. Also, if a state has a high GDP, their citizens have more money to spend, potentially on illegal narcotics.

Every state realizes that drugs are dangerous for the economy and the safety of the state. Since the money that flows into the drug market is illegally obtained, it is not factored into the GDP of the state, hurting the economy. No one likes losing money, and drugs cause the states to lose a large sum of money, encouraging them to fight back.

$H4_a$: States with higher GDPs have a higher quantity of illegal narcotics seized.

$H4_o$: GDP has no relationship with the quantity of illegal narcotics seized.

I assert the location of a state has a correlation to the total quantity of narcotics seized. A majority of the drugs created are not made in the United States. Instead, they are made elsewhere and smuggled into the United States. These drugs are smuggled here in a variety of ways: underground tunnels, in tires, semi-trucks, gasoline tanks, and traps in cars.[24] When a state is a border state, the drugs are often smuggled there,

[24] Special Agent Strickland, *DEA Presentation*.

and if they are not successfully smuggled, they are seized, preventing other states from seizing them. I theorize that border states have more opportunities to seize narcotics than non-border states, causing their total quantity of narcotics to rise.

$H5_a$: Border states have a higher quantity of illegal narcotics seized.

$H5_o$: Being a border state has no relationship with the quantity of illegal narcotics seized.

The political party affiliation of the state impacts many decisions made across the state on a daily basis. Many of these decisions are long-term and are often controversial across the nation. Specifically, drug enforcement is viewed differently across the nation. In Republican-leaning states, marijuana is usually not legal while in Democratic states, marijuana is often legal and not punished. I posit that there is a direct correlation between the quantity of illegal narcotics seized and political party affiliation. I also theorize that Republican states prioritize and fund their law enforcement more than Democratic states causing them to seize more narcotics.

$H6_a$: Republican states have a higher quantity of illegal narcotics seized.

$H6_o$: The political party affiliation of a state has no relationship with the quantity of illegal narcotics seized.

As I previously discussed, I assert the location of a state has an effect on the quantity of illegal narcotics seized. However, I now discuss how landlocked states affect the quantity of narcotics seized instead of the state being a border state. One of the many ways drugs get to the United States is by boat, and when a state is landlocked there is now one less medium for the drugs to enter that state. When another medium of entry to a state is created, this causes the total amount of drugs in the state to rise, and therefore, the quantity seized to rise as well. A state like Iowa has fewer mediums of entry for drugs to enter, causing less drugs to reach Iowa. On the other hand, an entire border of California is oceanfront, giving more mediums of entry to traffickers.

$H7_a$: Landlocked states have a lower quantity of illegal narcotics seized.

$H7_o$: Landlocked states have no relationship with the quantity of illegal narcotics seized.

Findings

As previously stated, illegal narcotics are a significant problem across the United States and ruin millions of people's lives every year. These drugs cause many issues such as addiction, death, and family strife. I run an ordinary least squares regression model (OLS regression), analyzing and studying 18 different states, from 2019-2022, for a total of 72 different cases. Below, I first restate my hypotheses for each of my independent variables and their expected relationships to the dependent variable. I used three continuous, and four dichotomous variables. Following the hypotheses, I discuss how well my model represents the data, using R- squared, and adjusted R- squared.

The table below titled "Model Summary" lists multiple values that are important in understanding my study. The table describes the effectiveness of my variables and how they affect the total quantity of illegal narcotics seized. The R-squared is the most important value because it represents the percentage of the variance in my dependent variable that is predicted by the independent variables in my model. For my data specifically, the R-Squared is .802, which means 80.2% of the variance of the total quantity of illegal narcotics seized can be predicted by my independent variables. This shows that the variables I picked are prominent, and they ultimately affect the quantity of illegal narcotics seized in a state.

The adjusted R-Squared is similar to the R-Squared, and it is just as important. Unlike the R-squared, the adjusted R-squared penalizes according to the number of variables used in the study. My adjusted R-Squared value is .781, which means that my independent variables predict 78.1% of the variance of the total quantity of illegal narcotics seized. The adjusted R-squared only changes around two percent because I only use seven independent variables in my study, which means that I do not have to worry about the integrity of my study.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate

1	.896[a]	.802	.781	41082.888057058

a. Predictors: (Constant), Political Party Affiliation, Population Estimate, Border State, Coastal, Legalized Recreational Marijuana, Overdose, GDP

The next table titled “OLS Regression Results” is the rest of my results that my data produced. My independent variables are listed on the left side and on the right side is the dependent variable's relationship with the specific independent variable. The values in the table are vastly important and tell me what my data means. The right column has three important aspects to it: the top number, the bottom number in parentheses, and the potential asterisks by the top number. The top number represents the unstandardized beta, which conveys the relationship, or slope, between my independent variable and dependent variable. The bottom number, that is in parentheses, represents the standard error. Finally, the asterisks represent significance levels; one asterisk means that the independent variable meets the 90% confidence level, while two represents a 95% confidence level, and a 99% confidence level is shown by three asterisks.

OLS Regression Results	
	Quantity of Illegal Narcotics Seized
Total Number of Overdose Deaths	-22.884 *** (4.581)
Total Estimated Population	.014 *** (.003)
Legalized Recreational Marijuana	27,922.826 * (15,899.031)
GDP	-.034 (.028)

Border State	19,765.433 (12,298.968)
Political Party Affiliation	20,429.369 (15,372.568)
Coastal	-6,030.703 (12,310.374)
Constant	-51,803.850 ** (15,750.589)
Standard Errors in Parenthesis * p < .1, ** p < .05, *** p <.01	

My first independent variable is the total number of overdose deaths per state, and as previously stated, I assert that there is a positive relationship between the quantity of illegal narcotics seized and the number of overdose deaths. After running my OLS study, there is actually a negative relationship, and for every one overdose death, the state loses out on 22.884 pounds of narcotics. The three asterisks mean that the number is statistically significant and meets the 99% confidence interval. The 22.884 pounds of narcotics is substantively significant for one singular overdose death, and the standard error of the variable is 4.581.

Even though my thought process was logical, it was still wrong. The negative relationship is explained by the fact that every overdose death means the state loses a drug user, and there is now one less person in that state who uses drugs. The only part of the data that is concerning is how steep the slope is. One singular death relating to over 22 pounds of drugs is exceptionally high, because 22 pounds of drugs is an impressive amount for one person to use in a singular year. I posit this is explained through the fact that this person who overdosed was not doing everything on their own. The quantity of narcotics seized can be largely affected by the ability of law enforcement to find and catch drug distributors. This is because drug manufacturers and distributors possess a much larger quantity of drugs than users. An overdose death indicates

the loss of business and connection to that distributor, and therefore potential access to that distributor is lost along with the access to their drugs. Also, to state it simply, there is now one less drug user in the state, and one less person who is interested in drugs.

Estimated total population is my second independent variable. I analyze a positive relationship between the two. After running my data, I discovered that there is a positive correlation, and for every one person increase in a state there is .014 pound increase in total drugs seized. This data is also statistically significant (represented by the three asterisks) meaning it meets the 99% confidence interval level; however, it is not substantively significant. This is because for a state's total drug seizure in one singular year, .014 pounds of drugs is not a significant amount. As stated in the table, the standard error is .003. As discussed previously, I theorize that this relationship is positive because drugs go where money is, and there is more money where there are more people. I still suggest this remains the reasoning for the positive correlation.

Thirdly, states that have legalized recreational marijuana are thought to have a negative relationship with the quantity of illegal narcotics seized. The regression results show that when a state has legalized the use of recreational marijuana the state seizes 27,922.826 more pounds of illegal narcotics. This independent variable meets the 90% confidence interval but is not statistically significant because it is only 90% and not at the 95% level. The standard error of the variable is 15,899.031. These results not only mean that my initial hypothesis was incorrect, but that it was wrong in a substantively significant way. The regression results number of 27,922.826 pounds of drugs is just under 14 tons, and that is a plentiful amount for any state in a singular year.

I hypothesize that the reason for the positive relationship instead of the negative relationship is that marijuana is known as a gateway drug. A gateway drug is "a habit-forming drug, while itself not addictive, may lead to the use of other addictive drugs."[25] When states legalize marijuana, citizens decide to try it, which can lead them to try other drugs. I theorize that drug manufacturers know what states have legalized marijuana, and they send illegal narcotics to those states hoping that they will get citizens to try those drugs, creating a lifelong customer.

[25] "Gateway Drug," *Google*, Accessed 1 Nov 2023.

Another reason is that these states are friendlier to drugs than other states, potentially inviting drug users to come to that state.

My next independent variable is the gross domestic product of a state. I stated that there is a positive relationship between GDP and the quantity of illegal narcotics seized. After running my model, it shows that there is actually a negative relationship between the two variables. The first value means that for every one million dollars increased in GDP the state seizes .034 pounds less of illegal narcotics. This data is not statistically significant nor is it substantively significant, and it has a standard error of .028.

Since my initial hypothesis was incorrect, I theorize that there is a negative relationship between the variables because states with lower GDPs tend to have a higher poverty rate. When there is a higher poverty rate there is usually a higher homelessness rate. Unfortunately, many homeless people fall into the trap of the addiction to narcotics explaining the negative slope relationship between GDP and the quantity of narcotics seized.

Whether or not a state borders another nation or not is my next independent variable. I predicted that this would have a positive correlation with the quantity of illegal narcotics seized, and after interpreting the model, it, in fact, has a positive relationship. When a state is along the border, it seizes 19765.433 more pounds of illegal narcotics. Unfortunately, this is not statistically significant; therefore, not substantively significant either. The standard error is 12298.968. These results correlate because a majority of the drugs that come into the United States are smuggled.

My next independent variable is the political party affiliation of a state. I predicted that if a state voted Republican in the last presidential election, the state would seize a higher total quantity of illegal narcotics. The OLS regression data shows that when a state is associated with the Republican party, they seize 20,429.369 more pounds of illegal narcotics. This data is not statistically significant, and the standard error is 15,372.568. My initial hypothesis of a positive relationship is correct.

My final independent variable is whether or not a state is landlocked. My initial theory was that landlocked states have a negative relationship with the quantity of illegal narcotics seized. After running the regression model there is a negative relationship between the two variables, and when a state is landlocked, they seize 6,030.703 less

pounds of narcotics. Unfortunately, the data is not statistically significant. The standard error of this variable is 12,310.374. These pieces of data mean that my initial hypothesis was correct, and my theory of the quantity increasing because of the extra entry point for drugs is sound.

The results of my OLS model were surprising for me to analyze. Four of my original seven hypotheses were correct, and one of them was statistically and substantively significant in the wrong direction. Although my hypotheses were incorrect, I conclude that my new theories for the relationships describe the true relationships. As a whole, my data has two variables that are statistically significant, and one variable that is substantively significant. My independent variables are strongly related to my dependent variable, and my R-squared value of .802 represents the strength of the relationship. I am pleased with my data and the representation it has on my overall study.

Conclusion

My research question is "What factors impact the quantity of illegal narcotics seized across America?" and how seven independent variables positively or negatively affect that quantity. Those seven variables include three continuous variables and four dichotomous variables. The variables include the following: the total number of overdose deaths in a state, the population of a state, whether a state has legalized marijuana, the Gross Domestic Product of a state, whether or not a state is a border state, the state's political party affiliation, and whether or not a state is a coastal state. My study includes 18 states over a four-year period and aims to help combat the war on drugs. This potentially aids law enforcement in knowing from where drugs are coming and how they may fight them.

The only variable that is both statistically and substantively significant is the total number of overdose deaths in a state. I initially theorized that there would be a positive relationship between overdose deaths and the quantity of illegal narcotics seized; however, after running the test I discovered that there was a negative relationship. The negative relationship stems from the fact that every overdose death equals the loss of a drug user. I have one other variable that is statistically significant but not substantively significant: estimated population. The amount of people in a state affects the quantity of narcotics seized purely because

more people attract more drugs. As to why it was not substantively significant, I theorize it is because drugs are everywhere and are not always caught in states where the population is more dispersed.

None of my other variables were statistically significant; however, that does not mean there is no value in the information produced from the regression. I contend that the dichotomous variables are not significant because my study only deals with 18 of the 50 states. For instance, seven of my 18 states are landlocked, representing a small proportion of the total number of landlocked states. Since my study leaves out so many states, it is hard to say how the other states would have affected the data. With the variables I picked, there is no better way to run the test. It just happened that my variables are not significant.

My study suggests that certain types of states are more likely to seize a larger quantity of drugs. It is a well-known fact that border states seize a higher quantity of drugs, because the location of the state is crucial. However, according to my statistics, states that vote Republican, border states, and landlocked states seize the highest quantities of narcotics. If I was to create policies, I would dive deeper into what the states' that seize the highest quantity of narcotics policies are and do my best to encourage the states who don't seized as much to embrace some of their policies. Obviously, this is easier said than done with each state having their own political agenda, but the constant increase in production, distribution, and use of illegal narcotics is a serious issue that needs to be fought.

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