The Relationship Between Social Factors and Opioid Usage Across Counties in the United States: An Analysis

GEOG 4GA3

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CONTEXT

Drug overdose is one of the leading causes of accidental death; causing 65,000 deaths as of 2016 in the United States (Jones, Bruera, Abdi & Kantarjian, 2018). Opioids are a drug used widely for pain relief and have euphoric properties. Tolerance to the effects of this drug can occur after treatments, along with physical dependence shown by withdrawal symptoms after cessation of consumption (Van Ree, Gerrits, Vanderschuren, 1999). According to the WHO (2018), opioids can cause substance reliance that is described by a powerful urge to take opioids, and steady opioid use despite destructive consequences, respiratory depression, etc. Drugs such as opioids are separated into prescription pain relievers such as oxycodone and hydrocodone, and illicit substances like heroin. According to Jones, Bruera, Abdi & Kantarjian (2018), Americans are responsible for 80% of the world's oxycodone and 90% of the world's hydrocodone consumption. The biggest increase in drug overdose deaths occurred from 2015 to 2016 and involved synthetic opioids, most significantly, fentanyl (Lawrence, 2018). From 2018 to 2019, The Washington Post reported on fentanyl, which killed more than 30,000 people that year. If current trends proceed, the yearly death toll from fentanyl will converge to the yearly toll from traffic and gun accidents (The Washington Post, 2020).

Socioeconomic factors contributing to the high number of opioid use worldwide have been the research interest of many studies. For instance, disability, pension, unemployment, divorce, low income and low education are associated with persistent opioid use, based on a Norwegian study from 2005 (Svendsen, Fredheim, Romundstad, Borchgrevink & Skurtveit, 2014). According to Tetrault et al. (2007), both genders demonstrate a strong relationship between illicit substance use disorders and non-medical utilization of prescription opioids. Women who begin using illicit drugs at age 24 or older, have a mental illness, or are cigarette smokers are likely to have past-year non-medical use of prescription opioids (Tetrault, 2007). Additionally, men with past-year inhalant use are bound to have past-year non-medical use of prescription opioids (Tetrault, 2007).

Other factors responsible for opioid-related deaths include medical and mental disorders, age, sources of social and psychological stress (Webster, 2017). According to Khazan (2017), increased opioid usage is a physical manifestation of psychological wellness issues that have long been known to rise during times of economic decay. Research has shown that as the unemployment rate increases, deaths from both opioid-use and emergency room visits increase (Hollingsworth, 2017). Overall, various studies suggest that numerous drug overdoses are deaths of despair, deaths brought on by unemployment, hopelessness, physical and emotional pain (Khazan, 2017).

In conclusion, various socioeconomic factors have shown a correlation with opioid usage worldwide. These factors will be examined further in the study of opioid use in United States counties. This study is significant because to reduce opioid usage, the understanding of the relationship with socioeconomic factors is needed. Additionally, solutions can be implemented by physicians and other health professionals such as improving opioid prescribing practices as part of a coordinated public health approach (Schuchat, Houry & Guy, 2017).

OBJECTIVE

Research Question: Is there any causal relationship between social factors and opioid usage across counties in the United States?

The aim of this project is to explore the relationship between various social factors and how they may lead to opioid-related mortality and addiction across counties in the United States. To do this, previous studies have been analyzed and commonalities between them suggested a possible relationship between social factors and opioid usage. The role these factors have in opioid addiction in the United States will be investigated by comparing social factor data per county collected from the United States Census Bureau with the opioid-related data collected from the Drug Enforcement Administration. Using RStudio, this data will be plotted in maps and spatially analyzed using regression to find any trends and relationships in the datasets. By the

end of the project, the goal is to learn about which social factors are strongly correlated with opioid-related mortality across counties in the United States.

With changing trends in opioid-related mortality and addiction in the United States, it can be difficult to determine the root cause of the problem and variables such as social factors emphasizing the problem. Conducting analysis that utilizes data regarding drug flow and social factors from different counties can provide useful insight into current and future trends in the opioid crisis. Such insight can help understand the opioid-related costs to society, one of which may be increased pressure on healthcare institutions and communities, on a county and national level in relation to the United States. Additionally, it can help determine ways to reduce or combat these costs, which can range from introducing or improving specific drug treatment programs to awareness and other support resources. This can, in turn, result in reduced health risks for communities and improved social and community dynamics.

DATA

The data that will be used for this project is data from the Washington Post (collected from the Drug Enforcement Administration) and the United States Census Bureau. The data will consist of detailed opioid usage by county (number of pills, mortality rates, hospitalizations). From 2005 to 2014 around 130,000 deaths occurred across the country and more than 100 billion pills were distributed (Drilling into the DEA's pain pill database, 2019). The Drug Enforcement Administration has gathered data on the path of each pill prescribed throughout this time frame. The average number of pills per person in each county yearly will be examined to suggest the relative rate of opioid use in the United States. Additionally, data for social factors including income, education, age, sex, among others will be sourced from the Census Bureau. Statistics for average income, level of education, and sex for each age bracket will be compared to the opioid rate per county. Previous studies have found links between these factors and the rate of opioid usage. Looking at these variables will help us determine if there is any causal relationship with opioid usage in these counties.

ANTICIPATED FINDINGS

By the end of this research project, it will be determined if social factors, such as income, age, and gender affect opioid use in the United States. The purpose of the study is to find a relationship between different levels of income and opioid usage. Studies have shown that opioid use has been significantly more prevalent in low-income neighbourhoods and far less significant in high-income neighbourhoods (Cairncross et al., 2018). There is not much research that suggests that opioid use might be more prevalent in high-income areas than in middle income due to a surplus of income. The study will consider age as a social construct that may have an impact on opioid use. Based on a study in Massachusetts, United States, it is anticipated that the majority of opioid users are under the age of 50, particularly between the ages of 18 to 34 (National Academics of Sciences, Engineering, and Medicine, 2017). Different types of studies based on opioid use have shown that women are consistently more likely to use opioids more than men (Dale, et al., 2015; Tetrault, et al., 2008). While opioid use is more prevalent in women, the rate is generally consistent between men and women, which may suggest that there is not a strong relationship between gender and opioid use. It is anticipated that there will be a strong relationship between opioid use and income levels, as well as between age and opioid use. This study anticipates that one gender is not significantly more likely to use opioids, but rather, that females may only slightly be more likely to use them. By analyzing these social constructs (i.e. income, age and gender) of the United States alongside opioid use in the United States, this study will determine their relationships with each other.

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