OUR SCHOLARS

Identifying Contributing Factors to the Opioid Abuse in Indiana Using Visual Analytics

Student researcher: Ian Williams, Junior

As the Global Commission on Drugs stated in its 2017 report *The Opioid Crisis in America*, opioids' "addictive properties are creating an epidemic in the United States." This research project addresses the following questions in order to bring awareness to the opioid crisis: What are the contributing factors to opioid abuse in the state of Indiana that could be mitigated to reduce deaths? What unknown patterns exist in the Indiana data sets that could recommend solutions to the nationwide epidemic? What is the most effective way to visually represent these findings in efficient and affective manners? For my research, I used data sets from the Indy Big Data Challenge, information available to the public, and the Indiana State Department of Health. I analyzed the information by utilizing the seven stages of data visualization: acquire, parse, filter, mine, represent, refine, and interact.

The contributing factors to the opioid abuse in the state of Indiana are socioeconomic status, mental illness, high untreated pain levels, high stress, and other contributing addictions. Results indicate the most common race with opioid death overdoses is Caucasian while the gender most affected by opioid overdoses is males. This information is significant because it reveals some unrecognized patterns that exist in the data. Another previously unknown pattern in the data is that the age range of deaths tend to be from 25 to 55. Demographically, the areas in Indiana which tend to have the highest number of opioids are in urban areas. These and other findings are visually represented using Data Driven Documents (D3) which allows for interactive visualizations.
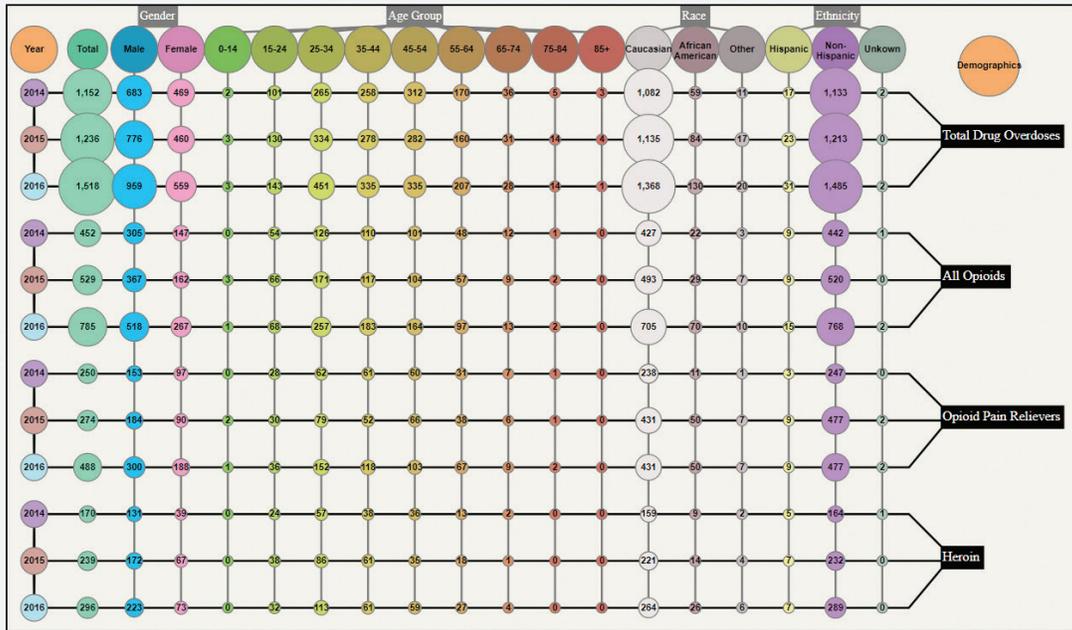
Prior to this research there had not been any interactive data visualizations accessible to the public. Therefore creating an interactive visual was crucial in heightening awareness of the epidemic. The first step of creating interactive visualizations has been completed; however, more interactive visualizations and research are necessary to fully comprehend the opioid epidemic in Indiana. With additional interactive visualizations, insights into the cause of the opioid epidemic and specific areas in Indiana could be targeted to develop solutions.

Byrd writes: "Data visualization is the process of transforming complex data into useful insight. The opioid crisis is a far-reaching, complex problem that will benefit from the application of visual analytics. Ian did a great job of applying visualization concepts and techniques to one of today's most relevant and current social issues."

Williams, I. (2018). Identifying contributing factors to the opioid abuse in Indiana using visual analytics. *Journal of Purdue Undergraduate Research, 8,* 84–85. https://doi.org/10.5703/1288284316762

Interactive visualization created with D3 (Data Driven Documents).

Williams, I. (2018). Identifying contributing factors to the opioid abuse in Indiana using visual analytics. *Journal of Purdue Undergraduate Research, 8,* 84–85. https://doi.org/10.5703/1288284316762