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STMATH 493: Data Analysis and Visualization  
Visualization 3: Chicago Crime and the State of Law Enforcement  
Analysis

This visualization was developed with the following question in mind, “For what crimes and in which districts are the resources of the Chicago Police being allocated?” This question was chosen because the data does not have a constant representation of reported crimes, so direct correlation to public safety and true crime rates is not trivial. Included in the dashboard is a map of Chicago, beginning with all criminal events (*Assault, Battery, Crim Sexual Assault, Homicide, Kidnapping, Narcotics, Robbery, Sex Offense, Weapons Violation, Arson, Burglary, Criminal Damage, Criminal Trespass, Motor Vehicle Theft, and Theft*), colored by district. Beneath the map, a legend for *Median Household Income* can be seen, as well as parameter controls for *District* and *Crime*.

Beneath the map described above are three separate and distinct visualizations that individually represent small portions of the data, but together describe the relationships and significance of the latest data with respect to various reported crimes. *Reported Crimes and Arrests Over Time* visualizes a variable district, and variable crimes to observe the overall trend over time for arrests and reports. The user is also able to see the proportion of arrests compared to non-arrests over time in the same graph, where portions of the graph below the arrest line are individuals that were arrested, and those above the line are not. This allows the viewer to understand that in 2001, roughly a third of the criminal reports resulted in an arrest, while in 2017, roughly a fifth are arrests.

Beside the visualization previously described is the *Percent Change in Crime Reporting*, which measures the change in a variable district of each of the measured crimes as a percent change from 2016 to 2017. These are separated by *Violent Crime* and *Property Crime*, allowing the viewer to see which crimes are changing from the previous year. Beneath these visualizations is the *Percent of Total Reported Crime*, which helps the viewer contextualize the insights drawn from the graphs above. In knowing what proportion of the total data a crime represents for 2017, the user can better understand the significance of a particular reduction or increase in the reporting of a crime from the previous year.

This visualization is a very dense collection of information packed into a small space. It is tailored to the educational or corporate setting, and allows for both generalized and highly specific questions. In creating this visualization, students are tasked with creating parameters and a dynamically changing collection of graphs, where the analysis allows the viewer to make connections between geodemographics and crime. The technology allows for the visible dimensionality to be expanded, which provides more access to the underlying data. After completing the end-user questions, the viewer should have a strong understanding of what each aspect of the visualization represents, and countless insights can be derived once that has been achieved. The general question leads the viewer to further questions, which this visualization allows the user to do. Through manipulation of the dashboard, the user can learn through discovery, which provides a much more enjoyable and thought-provoking experience.