Checkpoint 1: Relational Analytics

COMP_SCI 396/496: Data Science Seminar
Meenakshi Kommineni, Madison McClellan, Archana Ramasubramanian

Are certain types of use of force more common in certain districts?
To gain a stronger understanding about the police presence in each district, we started by writing a query to count the total number of TRR incidents in each of the 25 districts. This query revealed that there are extreme differences in the TRR counts for each district. The 11th district has the greatest number of TRR incidents with 29261 whereas the 20th district has the fewest with only 4275 incidents. Interestingly, when running a SELECT DISTINCT command on the district names, the database lists districts 1-25 and an additional 31st district. This district has 79 TRR incidents filed under it. We are unsure whether this is human error or whether the 31st district represents an actual region. We then ran a query to further break down the TRR incidents by the type of action taken by the officer. When initially looking at the results of this query, we saw that the same types of actions were used at similar frequencies in each district. For example, verbal commands are the most common TRR action in almost every single district, which makes sense given that this is a more mild use of force. Furthermore, the number of instances of each type of use of force is generally consistent with the overall presence of the police force in that district. For example, the 11th district has the third greatest number of instances of firearm use whereas the 20th district has the second least.

Does age play a role in what action the officer takes against the subject?
We first wrote a query to count the number of TRR incidents that occurred against subjects of each age, regardless of the action type. This query revealed that the subject age with the highest number of TRR incidents is 22, with a total of 15838 incidents. Ages 21, 23, 20, and 24 followed. We then wrote a query to calculate the average subject age across all TRR incidents, which was 30 years old. Although the highest number of incidents occurred against subjects in their early twenties, it makes sense that the average was slightly higher given that TRR incidents occurred against subjects as old as 99. We then wanted to determine whether the types of actions taken by officers differ based on the age of the subject. We decided to group subjects into three age ranges to simplify the results: 0-29, 30-59, and 60+. For each of these age groups, we wrote a query to divide the total number of TRR incidents based on the action type. This revealed that verbal commands were the most commonly used type of force against all age groups. This follows the conclusion from question one that verbal commands were the most commonly used type of force in almost every district. Furthermore, the number of instances of each type of use of force is relatively similar across each age group.

Are there trends in officers' actions based on the lighting conditions of the incident?
We first wrote a query to count the total number of TRR incidents for each of the six lighting conditions. The results of this query indicated that a vast majority of TRR incidents occur in good artificial lighting and daylight. Furthermore, when dividing TRR incidents by the type of action taken by the officer, a majority of each type of use of force occurred in good artificial lighting or daylight. These findings were inconsistent with our initial assumption that many TRR

incidents would occur at night or in poor lighting conditions.

Are officers more likely to use a firearm on an unarmed subject if they are off duty?
To get more context for this question, we started by writing a query to determine the number of instances of a use of firearm on armed vs. unarmed subjects, regardless of the status of the officer. This query revealed that 17% of incidents occurred on unarmed subjects (166 of 993 total instances) and the remaining 83% of incidents occurred on armed subjects (827 of 993 total instances). From this statistic, we can conclude that in a majority of instances where an officer uses a firearm, the subject is armed. We then wanted to learn more about these 166 instances of firearm use on unarmed subjects. We wrote a query to determine how many of these incidents were performed by on-duty vs. off-duty officers. Our initial assumption before writing this query was that there would be many instances of firearm use by off-duty officers. This reveals an underlying assumption that officers often engage in nefarious activity. However, this query revealed that only 14% of instances of firearm use on an unarmed subject were performed by off-duty officers (24 of 166 total instances). Although this is not the majority, it is still a surprisingly high proportion.

Are there trends in officers' actions based on the race of the subject?
Based on the query we ran to understand this trend, we understood that even though the Black population does not constitute the majority of Chicago's population (30% according to US Census Bureau in 2019), 75% of subjects involved in TRR incidents were Black. The second largest racial group involved in TRR incidents was Hispanic individuals, constituting 14% of subjects and 29% of the Chicago population. White individuals make up 50% of the Chicago population, but only 10% of subjects in TRR incidents. After viewing these results, we further analyzed these incidents by breaking down the percentage of subject race across different types of actions taken against them. We found out that the Black population again contributes to the majority of cases involving the use of a firearm. From these findings we can conclude that an officer is not more likely to use a certain type of force against a certain race but that they are more likely to use force in general against Black individuals.

Sources
https://www.census.gov/quickfacts/chicagocityillinois