

Chicago Crime Data Analysis

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Introduction

● *Background:*

Crime is a problem of widespread global concern, and its growing problem has caused widespread concern in recent years. A city's crime rate directly affects its safety level. As a well-known big city in the United States, the crime situation in Chicago has naturally received widespread attention. In recent years, with the continuous development of Chicago's economy, the quality of life of citizens and urban facilities have continued to improve. At the same time, police strategies and technologies have also been significantly improved, and residents' trust in the police has also been greatly improved. This study sought to understand Chicago crime patterns and trends through three years of data. It not only helps social scientists, policymakers, and law enforcement agencies better understand the safety situation in cities, but also provides the public with transparency about local criminal activity.

● *Data:*

Data on crime in Chicago in the past three years come from:

<https://data.cityofchicago.org/Public-Safety/Crimes-2001-to-Present/ijzp-q8t2/data>.

The data studied in this analysis is Chicago's crime data in 2014, 2018, and 2022.

These three data sets have 22 variables, but the observations are different. The 2014 data has 275796 rows, the 2018 data has 268922 rows, and the 2023 data has 202991 rows. These three-year data sets include crimes that occurred in the Chicago area.

Detailed records of events. Contains a variety of crime types, such as sexual crimes, domestic violence incidents, and other types of violations. Each incident is equipped with a unique case number and a detailed description of the time and location. The information in the data set also includes key details such as whether an arrest occurred, whether the incident involved domestic violence, and the exact location of the crime.

● *Question:*

Analyze in terms of time: Looking at the past three years, which month has the highest frequency of crime occurrences each year? Analysis from the type of crime:

Which types of crimes will be the most common in 2022? Are there significant differences in the number of cases for different crime types? At the same time, the crime situation in Chicago in the past three years will be analyzed based on time, crime, and type.

Methods

- *Data Wrangling:*

The data comes from Chicago in 2014, 2018, and 2022. The three initial data have 22 variables, but the observations are different. The 2014 data has 275796 rows, the 2018 data has 268922 rows, and the 2023 data has 202991 rows. First, I determined whether there were missing values in three different pieces of data to prevent missing values from affecting subsequent data analysis. After confirmation, I found that they were missing in different variables, and I chose to delete these missing values. For subsequent analysis, I chose to create a separate "moth" variable, which will facilitate my subsequent analysis. Finally, I chose to merge these three data into one data set, which makes analysis easier. After merging the data sets, missing values were finally identified again.

Results

- *Crime in Chicago by year*

Table1

Year <int>	total_crimes <int>
2014	273763
2018	263532
2022	233040

Table 1 shows the number of crimes in Chicago in 2014, 2018, and 2020. The total number of crimes in 2014 was 273,763, the total number of crimes in 2018 was 263,532, and the total number of crimes in 2020 was 233,040.

Figure1

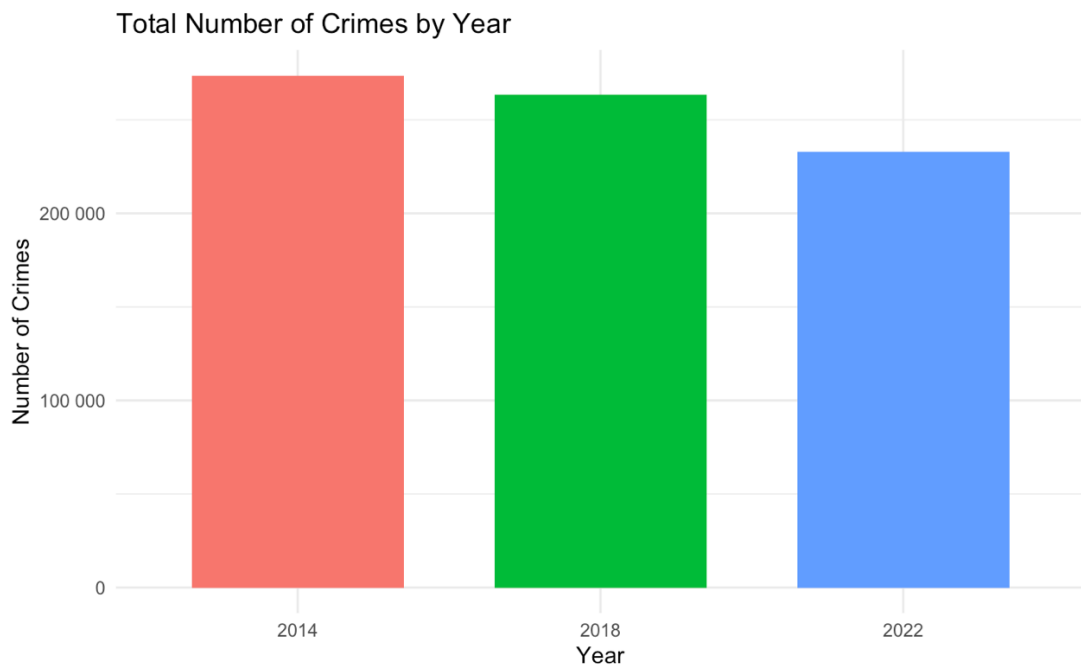


Figure 1 intuitively shows the number of crimes in Chicago in 2014, 2018, and 2020. Based on the histogram, it can be easily seen that the total number of crimes in 2014 was the highest among the three years. At the same time, it can also be observed that the total number of crimes in the past three years has gradually declined.

- *Monthly trend in each of the three different years*

Figure2

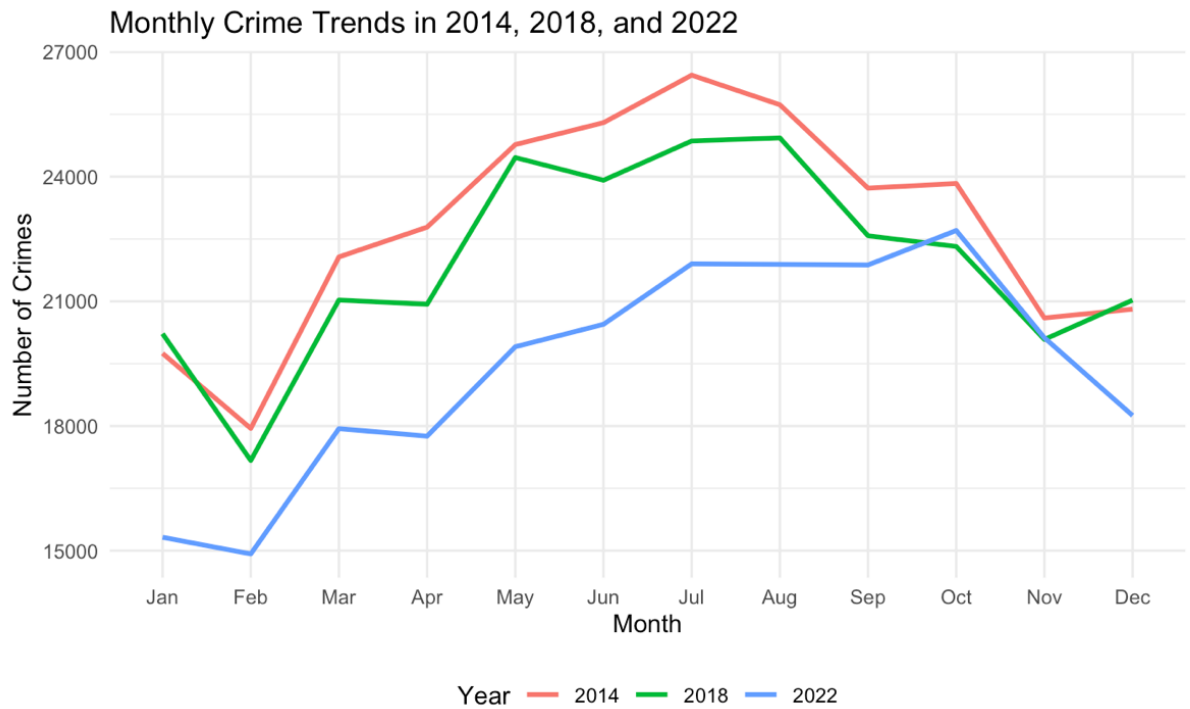


Figure 2 clearly shows the trend of monthly crime totals in Chicago over the past three years. The monthly trends over the past three years have a similar story. From January to July every year, the number of crimes increases, most notably in 2014 and 2018. From August to December each year, the number of crimes shows a downward trend.

- *Crime primary Type with year*

Figure3

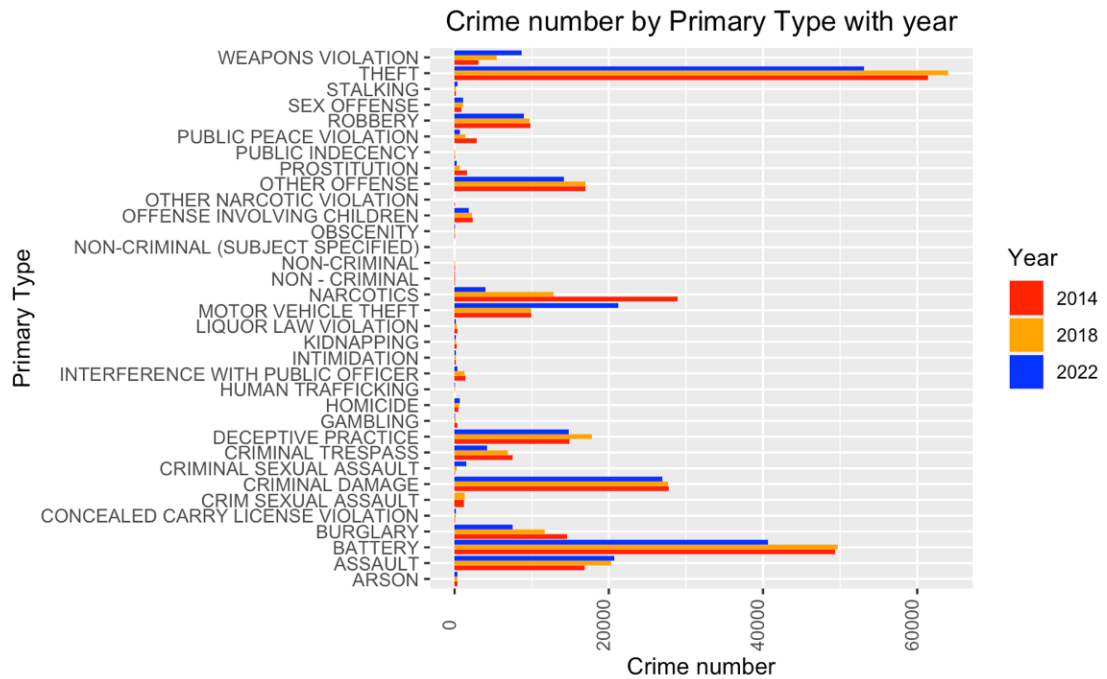


Figure 3 clearly shows the number of all crime types in Chicago over three years. The top three types of crimes are Theft, Battery, and Criminal Damage.

- *Types of crimes in the months with the highest number of crimes in 2022*

Table2

Primary.Type <chr>	count <int>
THEFT	5124
BATTERY	3483
MOTOR VEHICLE THEFT	3173
CRIMINAL DAMAGE	2805
ASSAULT	1832
DECEPTIVE PRACTICE	1396
OTHER OFFENSE	1127
ROBBERY	944
WEAPONS VIOLATION	732
BURGLARY	683

Table 2 shows the top ten crime types in October with the highest number of crimes in 2022. The top three crime types in October were Theft, Battery, Motor Vehicle theft.

- *Detail locations of the crime the largest number of crime types occurred in 2022.*

Table3

	District	count
1	19	454
2	18	432
3	12	412
4	1	389
5	14	281
6	8	259
7	16	254
8	24	254
9	2	247
10	25	234

Table3 shows the number of theft crimes in various neighborhoods in Chicago in October. According to this Table, we can know that Chicago neighborhood 19 has the highest number of thefts.

Figure4

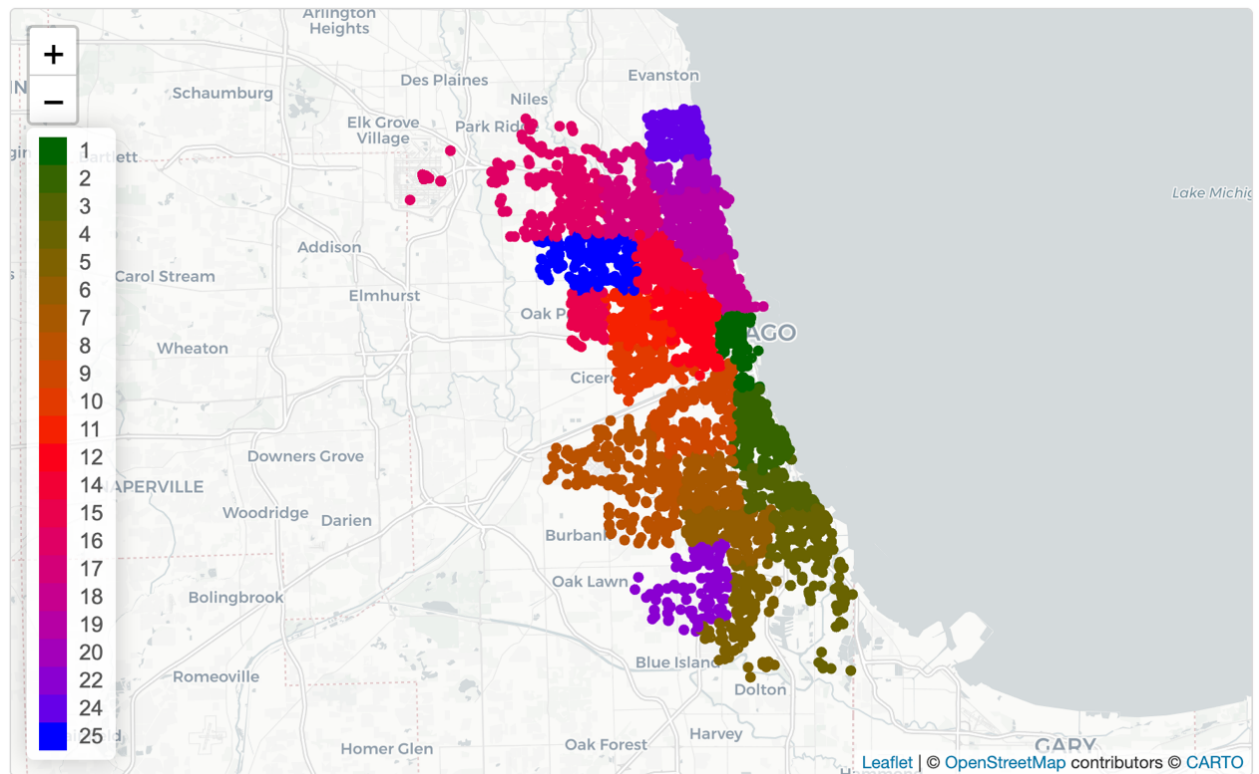


Figure 4 is a leaflet graph, which clearly shows the distribution of Theft, which has the most crimes, in various streets in Chicago in October 2022.

Conclusion and summary

This analysis provides some understanding of Chicago's basic crime situation in 2014, 2018, and 2022:

1. From a time analysis, judging from the total number of crimes in Chicago each year, the total number of crimes will be the least in 2022 and the most in 2014. The overall number of crimes appears to have decreased over the years. Looking at the monthly trends over the past three years, the trends over the past three years have been roughly the same. The number of crimes increased between January and July each of the three years. After July, the total number of crimes showed a downward trend.
2. From the analysis of crime types, from the three-year crime type statistics, theft has the largest number. Among them, looking at January 2022 (the month with the highest number of crimes), Chicago's unique 19 are the areas where theft crimes occurred.