

Data Science in Criminology : A Decade Analysis of Hong Kong

COMP2501 Project Presentation

Brian, Luk Chin Kiu (3035689025)



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Introduction to Criminology

“What is criminology?”

Criminology is the study of crime and criminal behavior, informed by principles of sociology and other non-legal fields, including psychology, economics, **statistics**, and anthropology. [1]

Beginning of Statistics in Criminology

Adolphe Quetelet

- Crime classification system developed (1820s) to understand social patterns
- Data on civilian social life and crime collected and managed by the government
- → France first country with national statistics in 1826

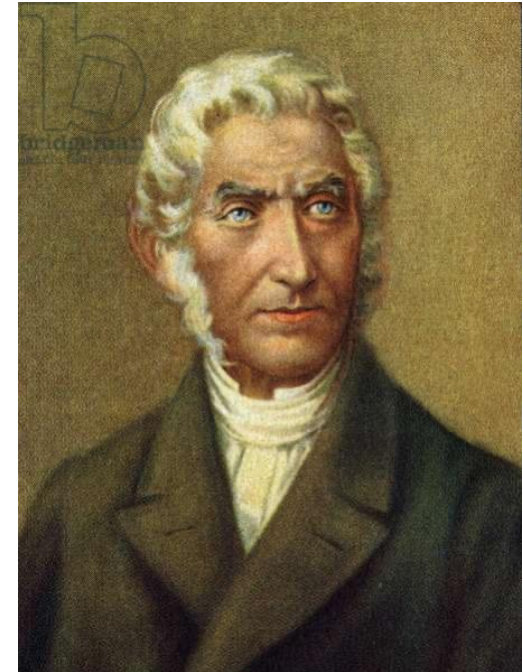


Figure 1: Portrait of Adolphe Quetelet [2]

Early Crime Statistics in Hong Kong

1870 Hong Kong Government Report:

“Serious crimes have increased 78.8%, minor offenses 20.5% and all crimes 32.4 % compared to 1869.”

Problem Definition

- Data Science's Role in Criminology
- Decade Analysis of Crime in Hong Kong

Data Science's Role in Criminology

- Performance evaluation of authorities in combatting crime
- Analysis of government policies
- Underlying causes of crime and victimization
- Public awareness of criminal activities in certain neighborhoods

→ Maintenance of public safety in Hong Kong

Decade Analysis of Crime in Hong Kong

Identify specific crime categories with significant variation and changes in crime rate.

- Efficient allocation of resources through evidence-based methods
- Maintenance of public safety in Hong Kong

Methodology

- Existing Works
- Data Available
- Libraries

Existing Works

“Crime Statistics in Detail” from the Police Official Webpage

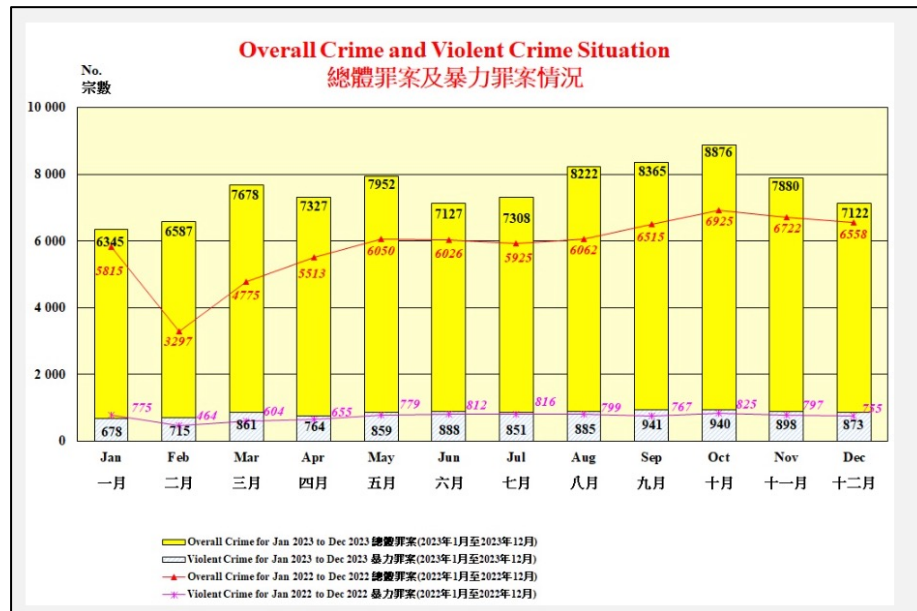


Figure 2a: Overall crime and violent crime situation in 2023 from the Police official webpage

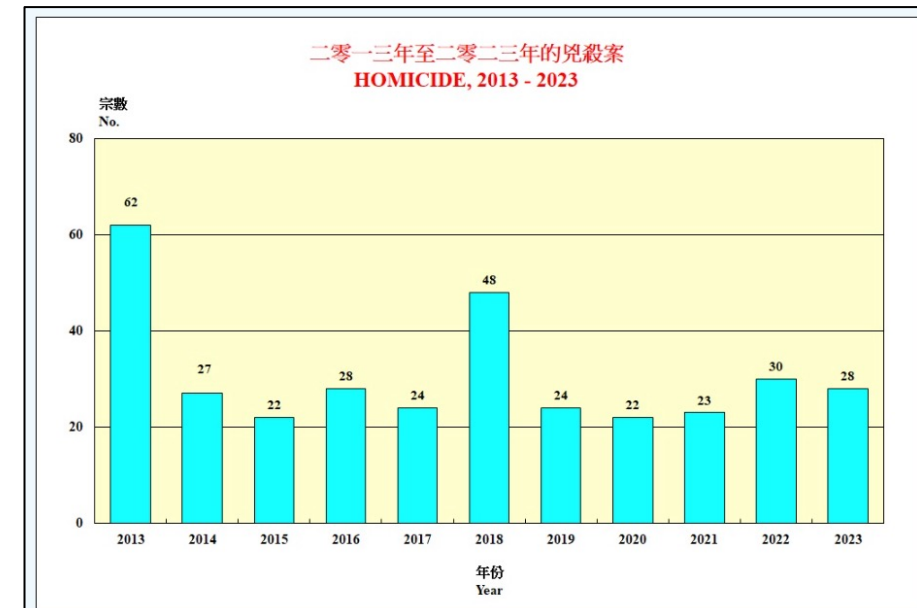


Figure 2b: Trend of Homicide from 2013 to 2023 from the Police official webpage

Data Available

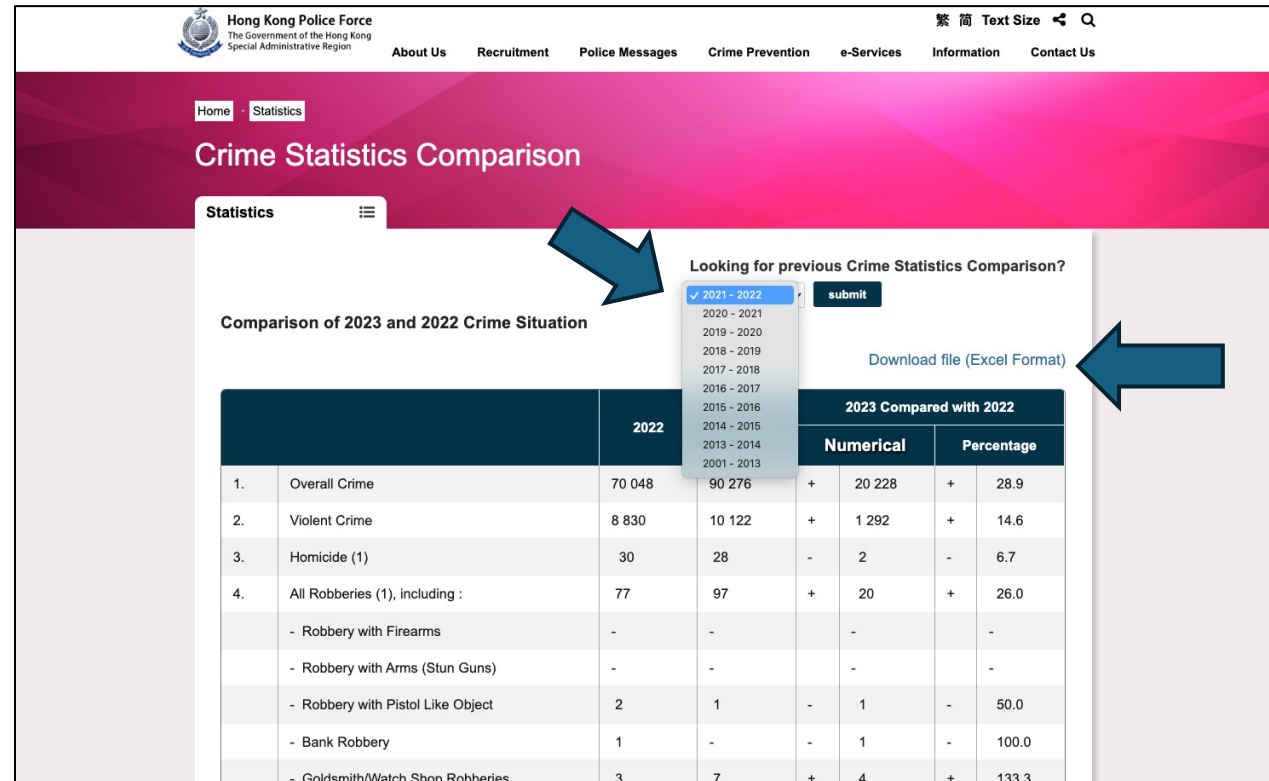


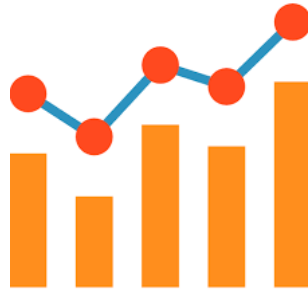
Figure 3: The Police official webpage to view crime data,
https://www.police.gov.hk/ppp_en/09_statistics/csc.html

Libraries

library(dplyr)



library(ggplot2)



library(rvest)

An icon showing a blue circle with a white robot head and a magnifying glass, symbolizing web scraping.

	Year	Overall Crime	Crime Rate	Violent Crime	Violent Crime Rate	Homicide	All Robberies	Bun
1	2013	72911	1016	12153	169	62		500
2	2014	67740	937	11073	153	27		309
3	2015	66439	911	10889	149	22		223
4	2016	60646	827	10103	138	25		260
5	2017	56017	758	9086	123			163
6	2018	54225	728	8884	119	24		163
7	2019	59225	789	9690	129	4		210
8	2020	63232	845	9391	126			264
9	2021	64428	869	9587	129			12
10	2022	70048	954	8830	120	30		7
11	2023	90276	1204	10122	135			97

Findings

Overall Crime in Hong Kong in the Past Decade

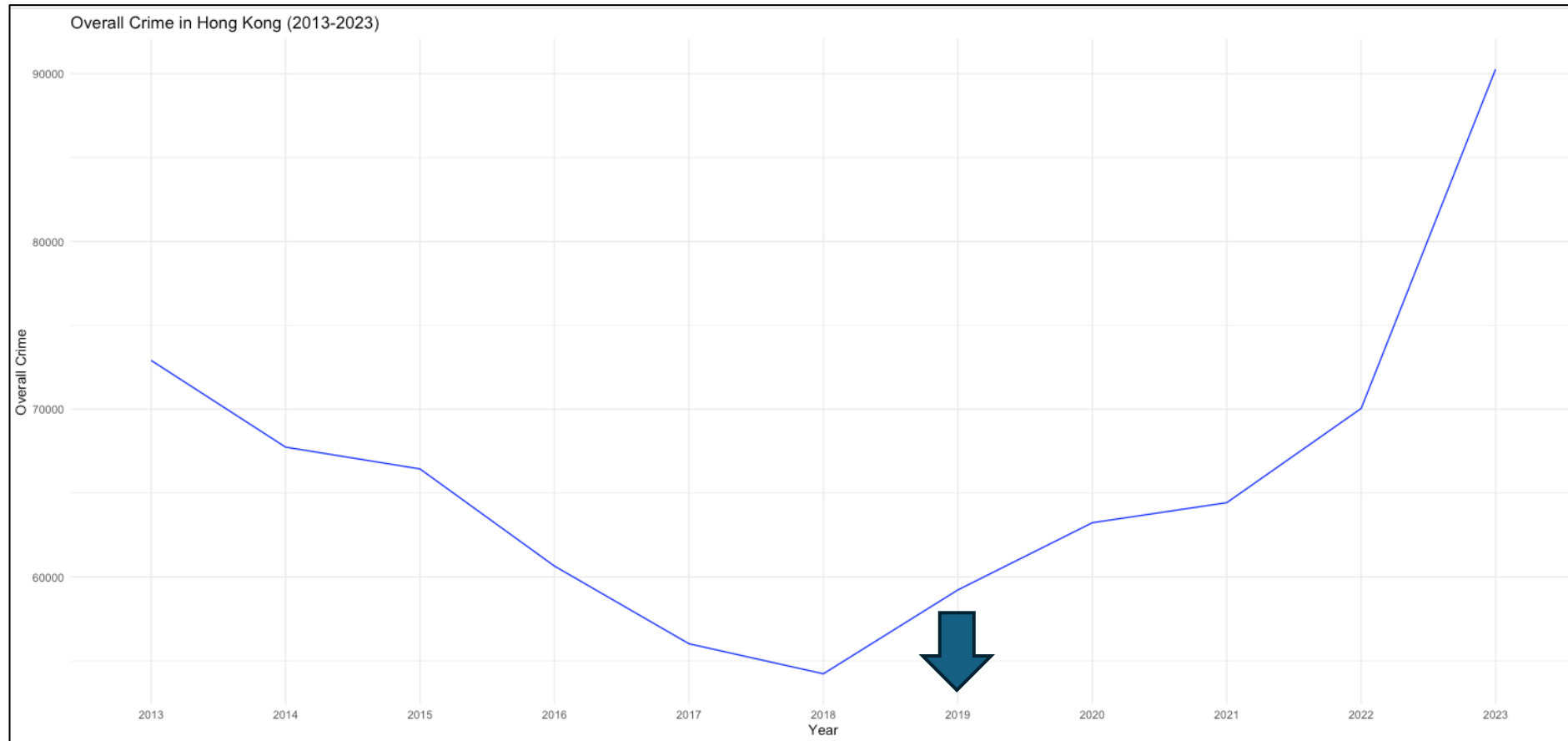


Figure 4: Chart showing overall crime in Hong Kong from 2013 to 2023 from the program R

Overall Crime in Hong Kong in the Past Decade

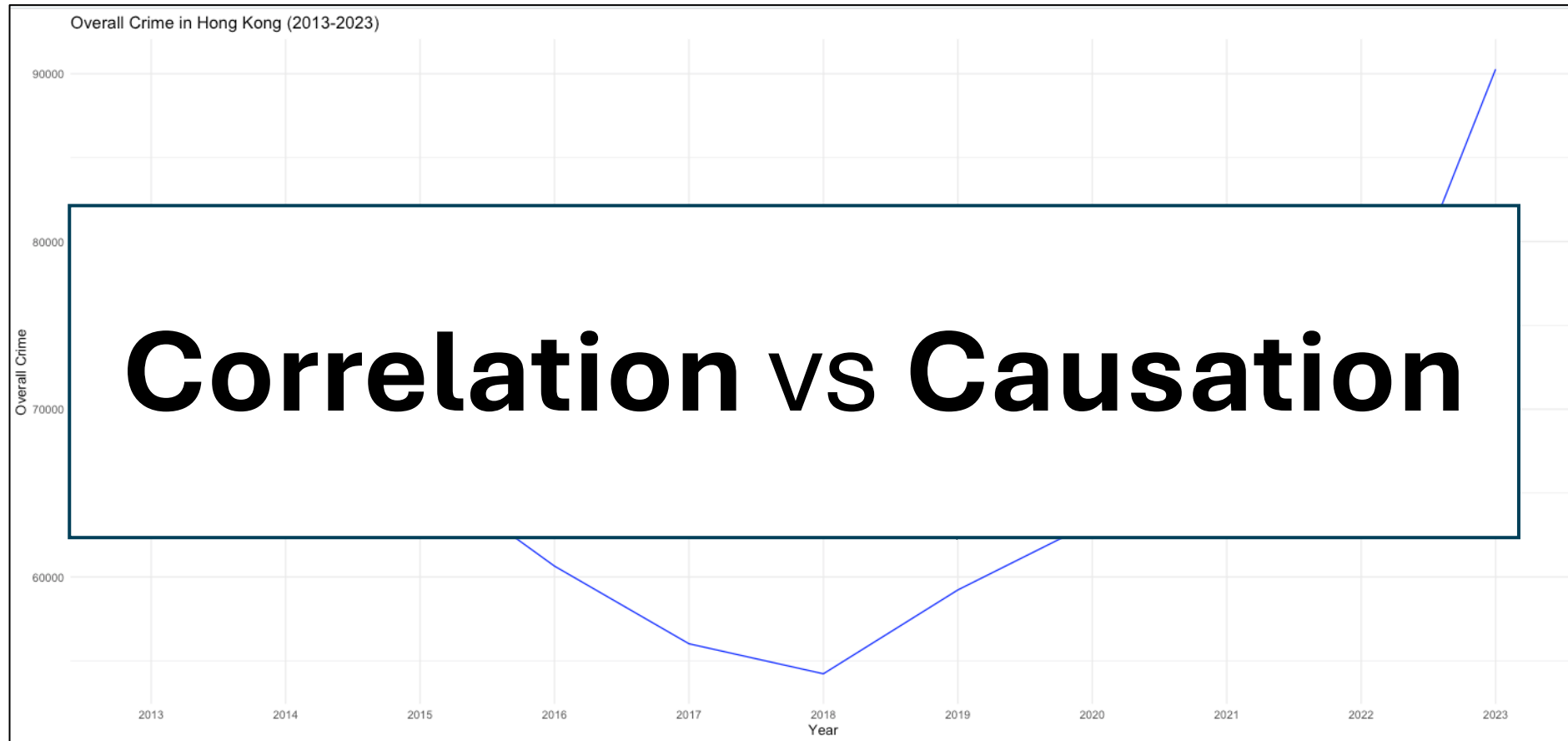


Figure 4: Chart showing overall crime in Hong Kong from 2013 to 2023 from the program R

Homicide in Hong Kong in the Past Decade

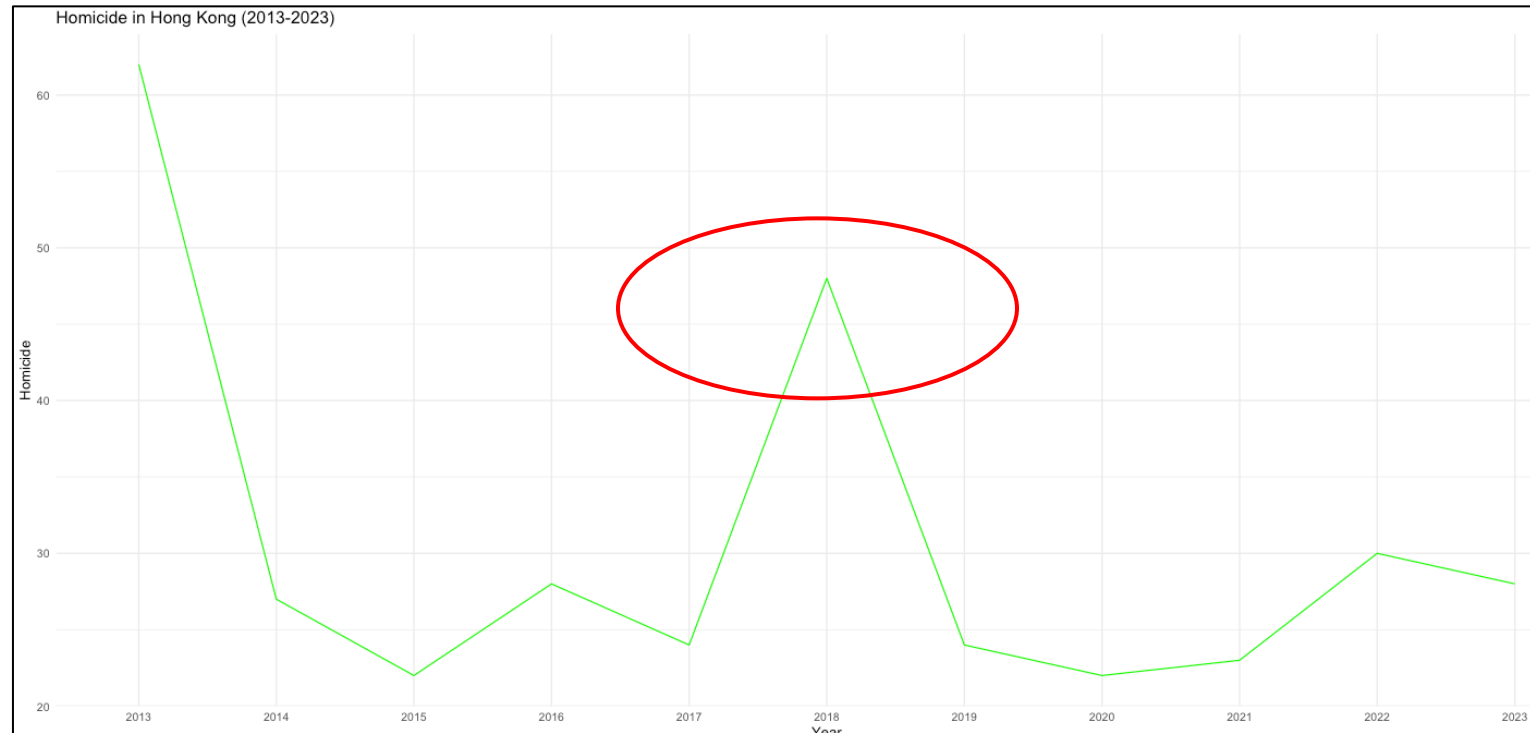


Figure 5: Chart showing homicide in Hong Kong from 2013 to 2023 from the program R

Violent Crime and Homicide in Hong Kong in the Past Decade

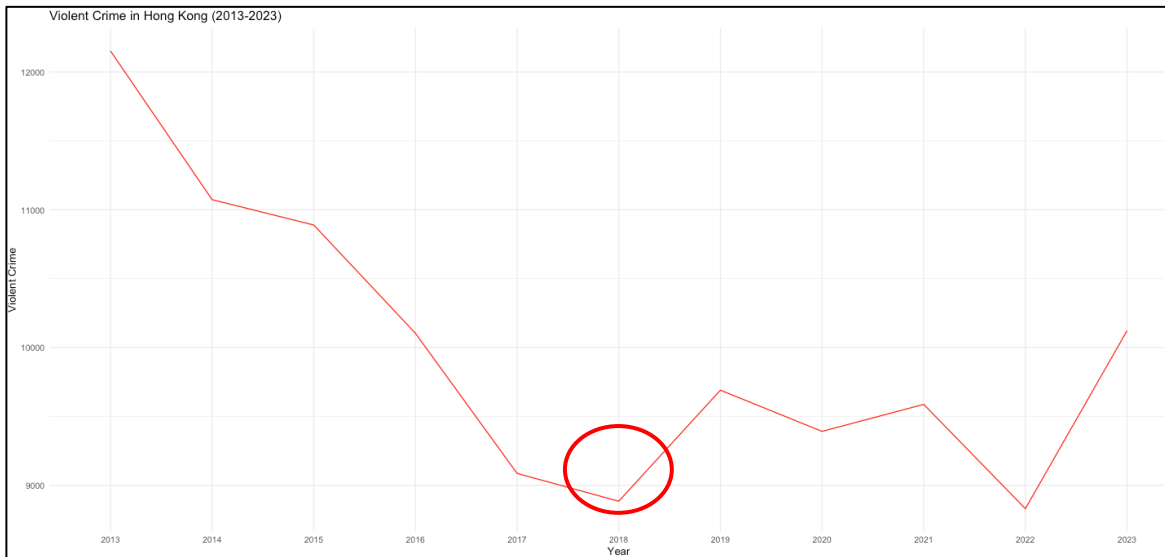


Figure 6: Chart showing violent crime in Hong Kong from 2013 to 2023 from the program R

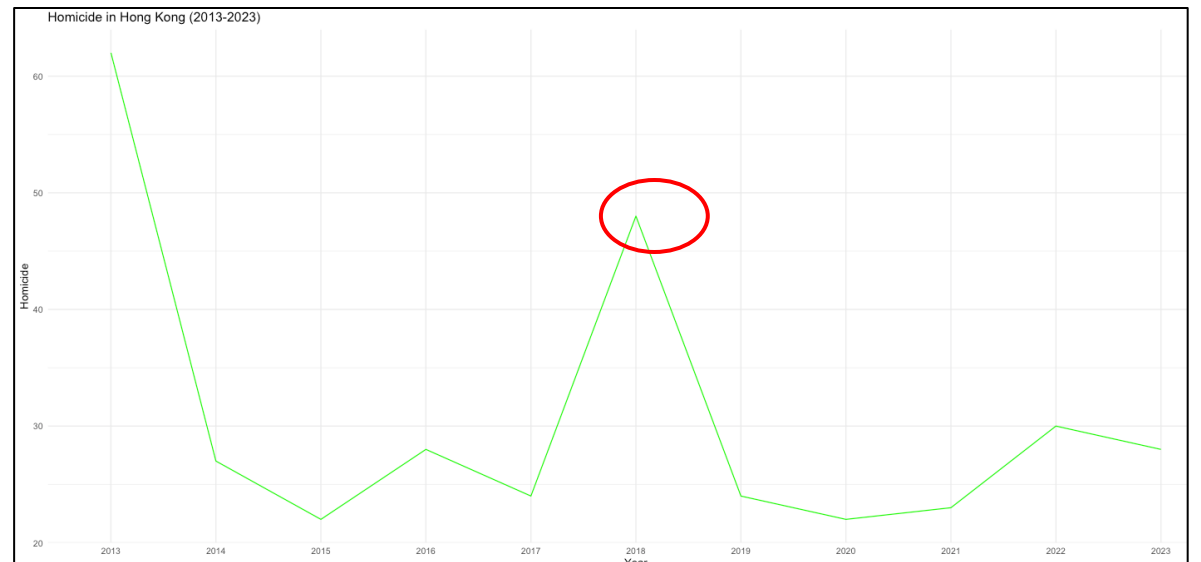


Figure 5: Chart showing homicide in Hong Kong from 2013 to 2023 from the program R

Overall Crime vs Violent Crime vs Homicide



Figure 7: Chart showing overall crime, violent crime and homicide in Hong Kong from 2013 to 2023 from the program R

Percentage Changes for each Crime Category in the Past Decade

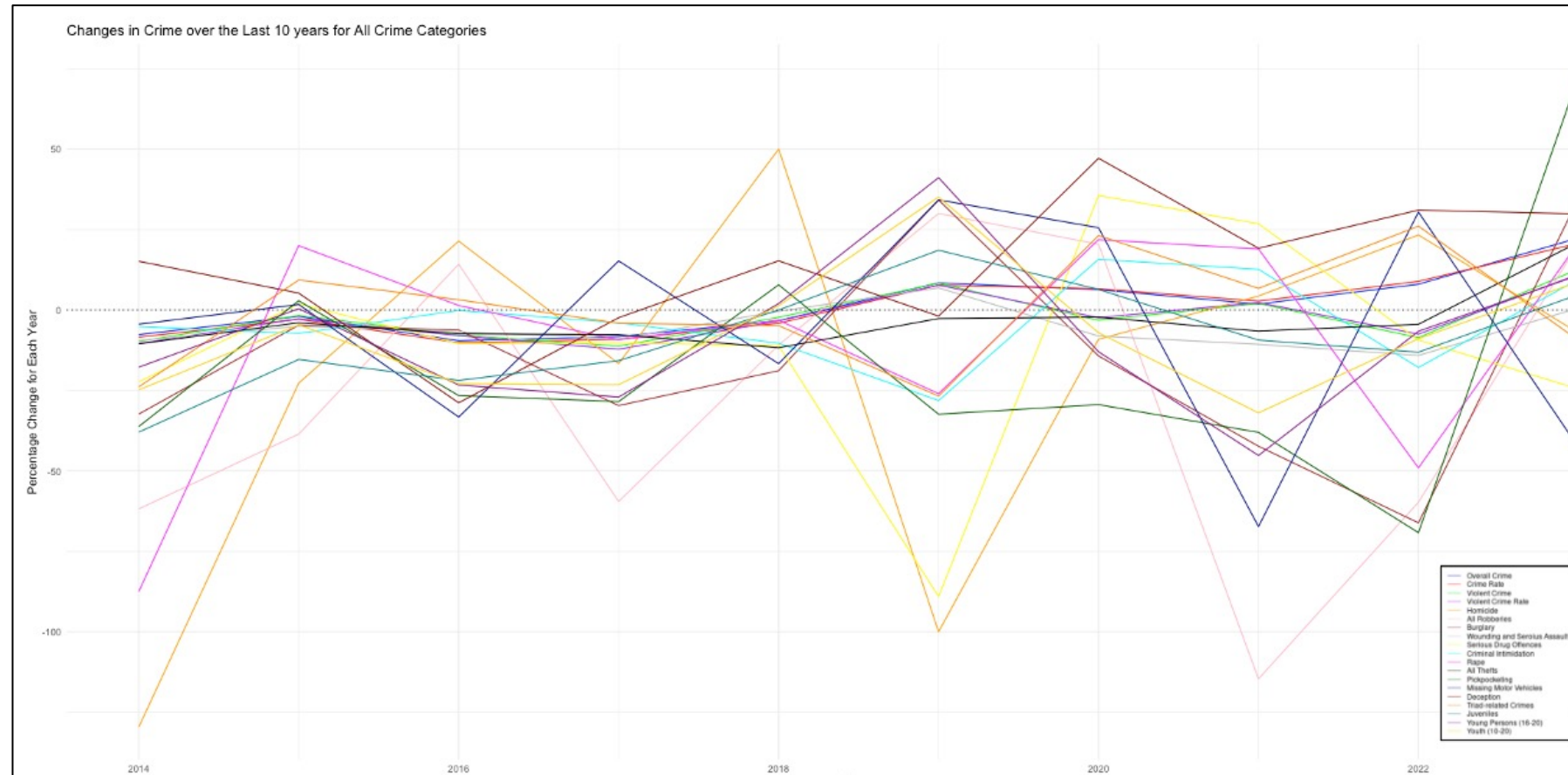


Figure 8: Chart showing percentage changes for all crime categories in Hong Kong from 2013 to 2023 from the program R

Percentage Changes for each Crime Category in the Past Decade

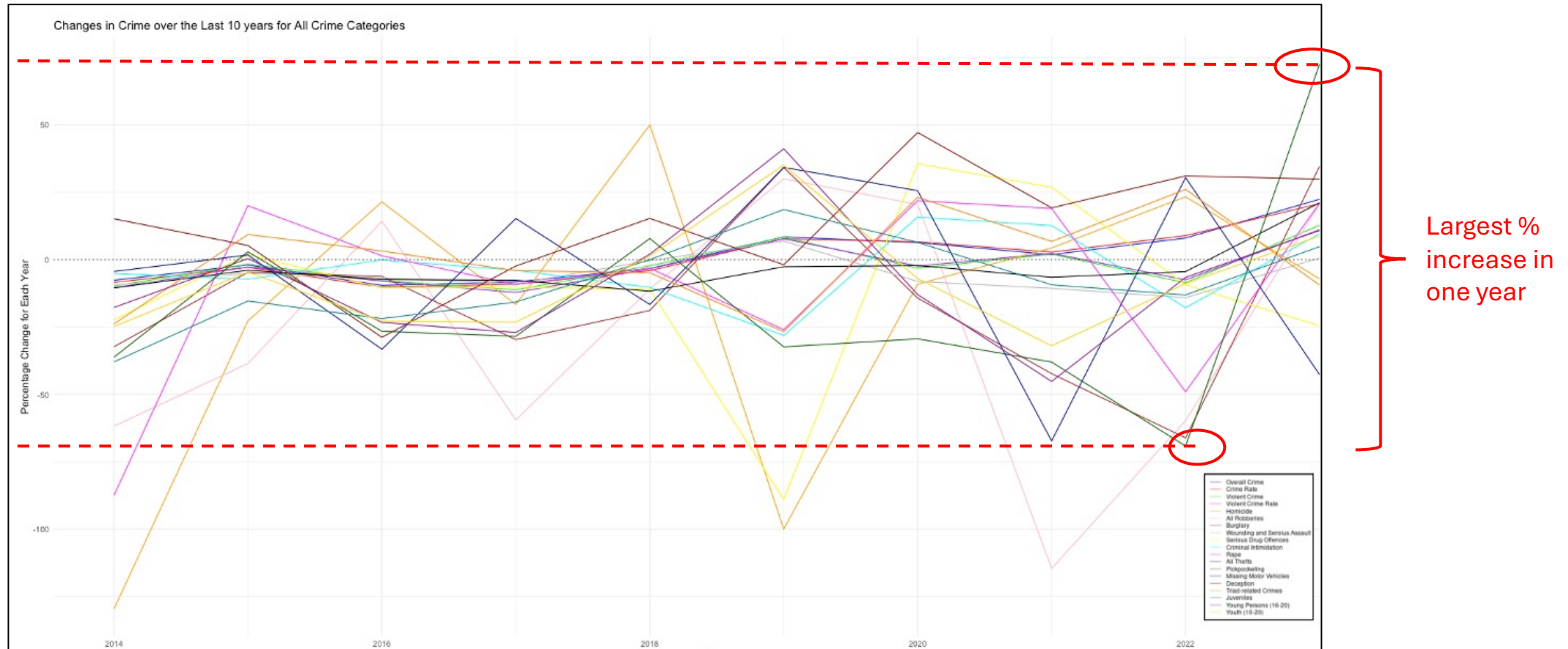


Figure 8: Chart showing percentage changes for all crime categories in Hong Kong from 2013 to 2023 from the program R

Percentage Changes for Pickpocketing in the Past Decade

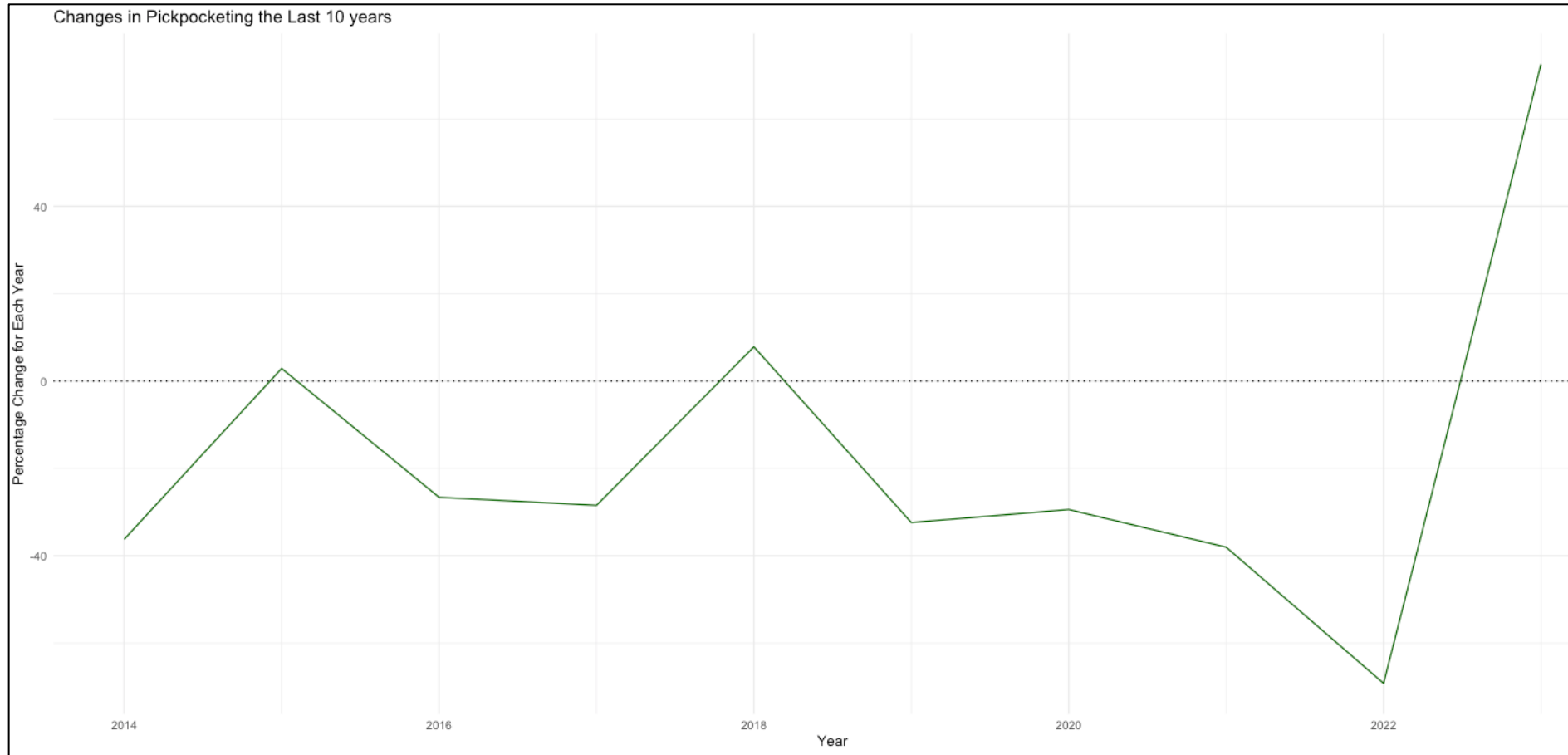


Figure 9: Chart showing percentage changes for pickpocketing in Hong Kong from 2013 to 2023 from the program R

Data Science's Role in Criminology

- Performance evaluation of authorities in combatting crime
- Analysis of government policies
- Underlying causes of crime and victimization
- Public awareness of criminal activities in certain neighborhoods

→ Maintenance of public safety in Hong Kong

Pickpocketing
is a real issue!



Challenges

Challenges

In crime statistics...

- Data collected underrepresent the actual prevalence of crimes
 - Fraud, sexual harassment...
- Non-identifiable offenders in crimes
- Profiling and biased policing
 - Racial profiling

Conclusion

Conclusion

- Introduction of criminology
- Purpose of data science
 - Efficient allocation of resources through evidence-based methods
 - Maintenance of public safety in Hong Kong
- Hong Kong Crime Statistics in the last 10 years
- Challenges

References

[1] <https://online.maryville.edu/online-bachelors-degrees/criminal-justice/resources/what-is-criminology/#:~:text=Criminology%20definition%20and%20history,economics%2C%20statistics%2C%20and%20anthropology>.

[2] <https://focusonbelgium.be/en/Do%20you%20know%20these%20Belgians/adolphe-quetelet-father-modern-statistics>

Thank you