"Dissemination of Education for Knowledge, Science and Culture"
-Shikhanmaharshi Dr. Bapuji Salunkhe

(स्वायत्त) कोल्हापूर

VIVEKANAND COLLEGE, KOLHAPUR
(Empowered Autonomous)

DEPARTMENT OF STATISTICS

A PROJECT REPORT
On

"STATISTICAL ANALYSIS OF CRIME OCCUR IN KOLHAPUR CITY"

Submitted by

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Mr. Sandesh Ashok Sutar

Mr. Sourabh Dadaso Metkari

Mr. Sai Mahesh Shinde

In partial fulfilment for the award of

the degree of

BACHELOR OF SCIENCE

in

STATISTICS

2023-24

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(Empowered Autonomous)

DEAPRTMENT OF STATISTICS

Certificate

This is to certify that,

Sr. No.	Name	Roll No.
1	**Mr. Hardik Dilip Patil**	**8318**
2	**Mr. Sandesh Ashok Sutar**	**8331**
3	**Mr. Sourabh Dadaso Metkari**	**8314**
4	**Mr. Sai Mahesh Shinde**	**8327**

Have satisfactorily completed the project work on **"STATISTICAL ANALYSIS OF CRIME IN KOLHAPUR CITY"** as a part of skill enhancement course for **B. Sc. III,** prescribed by the Department of Statistics, ***Vivekanand College, Kolhapur (Empowered Autonomous)*** in the academic year **2023-24**.

This project has been completed under our guidance and supervision. To the best of our knowledge and belief, the matter presented in this project report is original and has not been submitted elsewhere for any other purpose.

Project Guide
(Ms. Pandhare R. S.)

Examiner

Head
(Mrs. Shinde V. C.)

HEAD
DEPARTMENT OF STATISTICS
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

DECLARATION

We hereby declare that the project report entitled "**STATISTICAL ANALYSIS OF CRIME IN KOLHAPUR CITY"** written and submitted to **Vivekanand College, Kolhapur (Empowered Autonomous)** partial fulfilment of B.Sc. III (Statistics) under the guidance of **Ms. Pandhare R. S.** is our original work. The empirical results in this project are based on the data collected by ourselves.

We understand that any copying is liable to be published as the authorities deem fit.

Date:

Place: Kolhapur

Name	Roll No.	Sign
Hardik D. Patil	8318	
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Sourabh D. Metkari	8314	
Sai M. Shinde	8327	

ACKNOWLEGEMENT

We extremely thankful to **Mrs. V. C. Shinde, Head of Department of Statistics, Vivekanand College, Kolhapur (Empowered Autonomous)** for her valuable guidance and encouragement throughout this project work due to us during the study.

This project has been prepared under the guidance of **Ms. Pandhare R. S. mam**. We would like to thank **Ms. Pandhare R. S.** mam & **Ms. Makandar A. M.** mam for their support, suggestions and guidance for this project.

And also, we sincerely thankful to our parents for helping us in all aspects to complete the project work, as well as we would like to appreciate to our friends, colleagues for their direct and indirect contribution.

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INTRODUCTION

"The safety and well-being of citizens is a top priority for any city. However, crime remains a persistent problem in many urban areas, with rates of violent and property crime varying widely depending on the location. To develop effective strategies for crime prevention and law enforcement, it is essential to have a thorough understanding of crime patterns and trends. This project aims to analyse crime data in Kolhapur using statistical methods to identify key insights and trends. By examining the frequency, location, and characteristics of different types of crime, this project seeks to provide a comprehensive overview of the crime landscape in Kolhapur and inform data-driven decision-making for law enforcement and community stakeholders."

In daily Newspapers and on TV News channels we see that there is an increase in number of crimes and criminals in our society. Crime is a one of the measures of standard of society. Urbanization is that the human process whereby cities grow and their societies become urban. However, speedy urbanization has a different effect on crimes.

OBJECTIVES

Objectives of this project work are as follows:

- To determine the overall crime rate in Kolhapur city.
- To analyse the distribution of crimes by type (e.g. murder/homicide/assault, theft/burglary/robbery/drug related offences, etc.) & identify any trends or patterns.
- To examine the relationship between crime & demographic factors such as age, gender& area.

COLLECTION OF DATA

For our project we have collected the data of crime from 4 police stations (namely Shahupuri, Laxmipuri, Rajarampuri & Juna Rajwada) of Kolhapur city.

We have divided the crime cases into two categories namely Violence & Robbery. We have also collected the information of criminals with their Age, Crime, Gender, and their study from each police station. For study the independence of crime from these attributes.

STATISTICAL TOOLS USED FOR ANALYSIS

Diagrammatical representation of data

- Bar Diagram
- Sub-divided bar diagram
- Pie Chart
- Check Sheets

Tests Used for Analysis

- Chi-Square Test

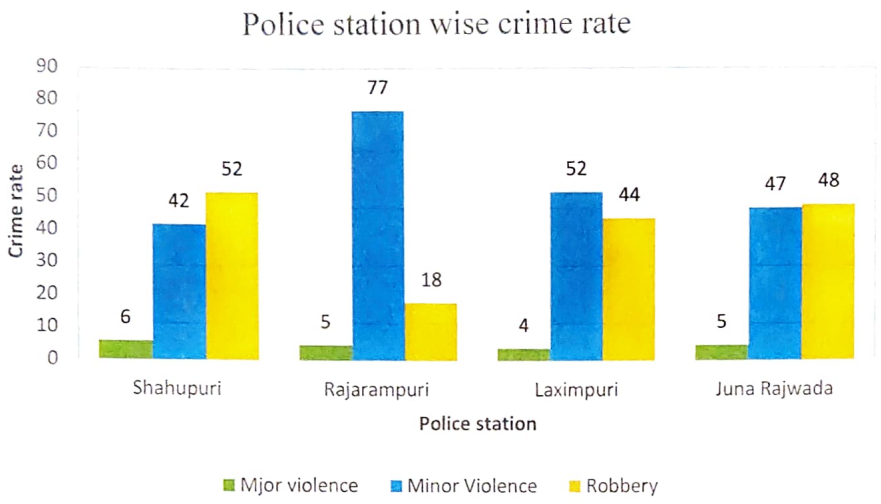
Software Used

- Microsoft Excel

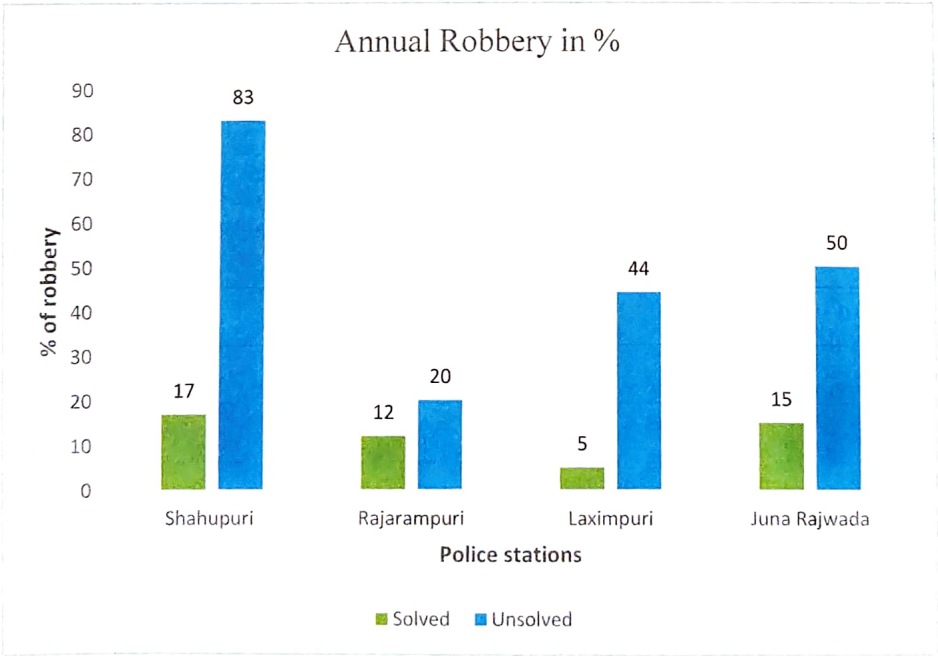
- Microsoft Word

- R Software

GRAPHICAL REPRESENTATION

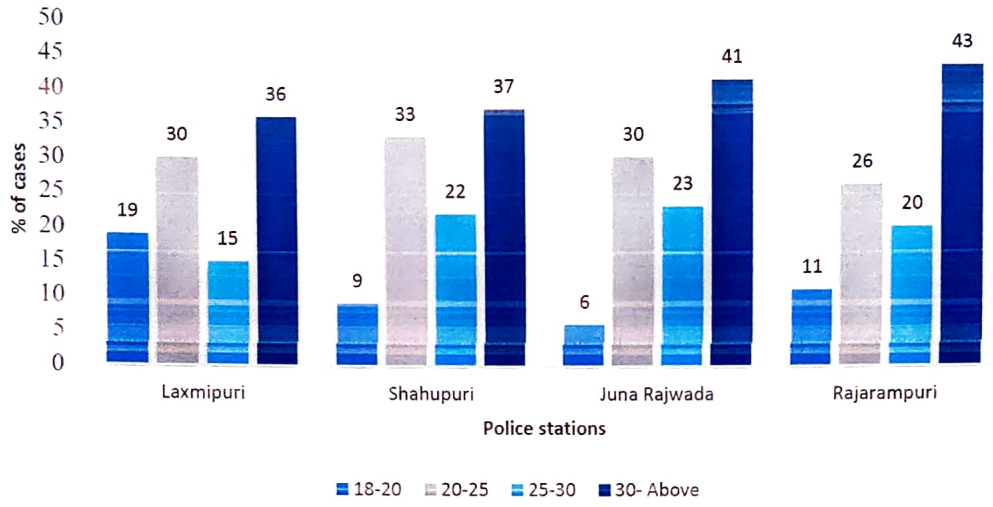


From the above graph, we say that in **Shahupuri police station** area, the cases of robbery are the highest in comparison with the other areas followed by **Juna Rajwada area**. In **Rajarampuri police station** area minor violence is the highest compared to others, followed by **Laxmipuri police station.**



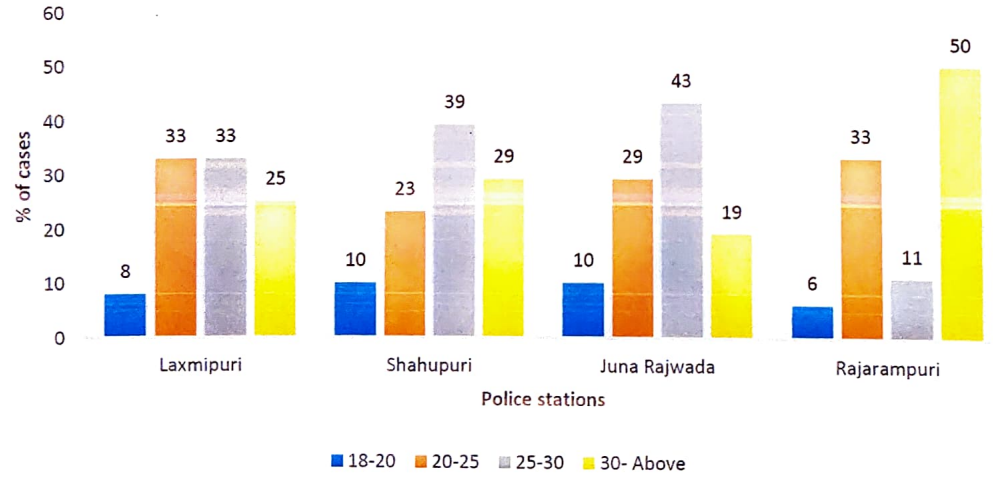
From the above graph we say that the annual report in Shahupuri area , the total Robbery cases are the highest & in Rajarampuri area total Robbery cases marked the lowest.

Age wise Minor cases in %

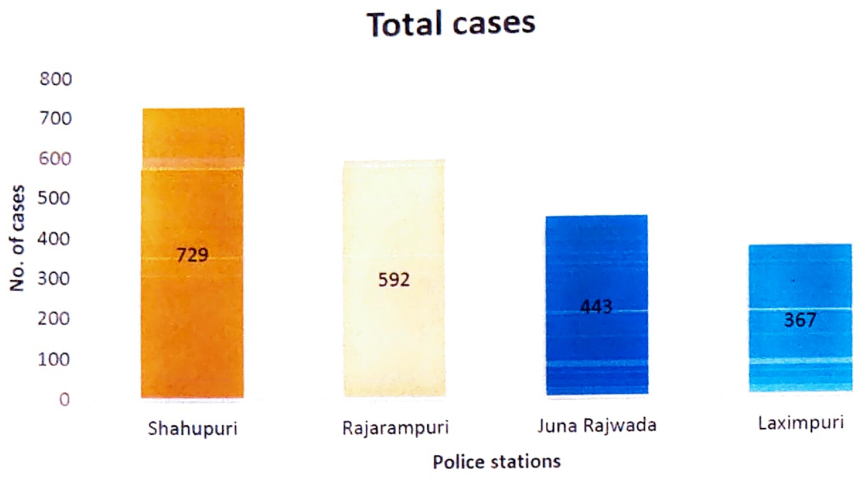


In above chart we say that the crime rate of minor crimes in age 30 & above comparatively higher than the other age groups.

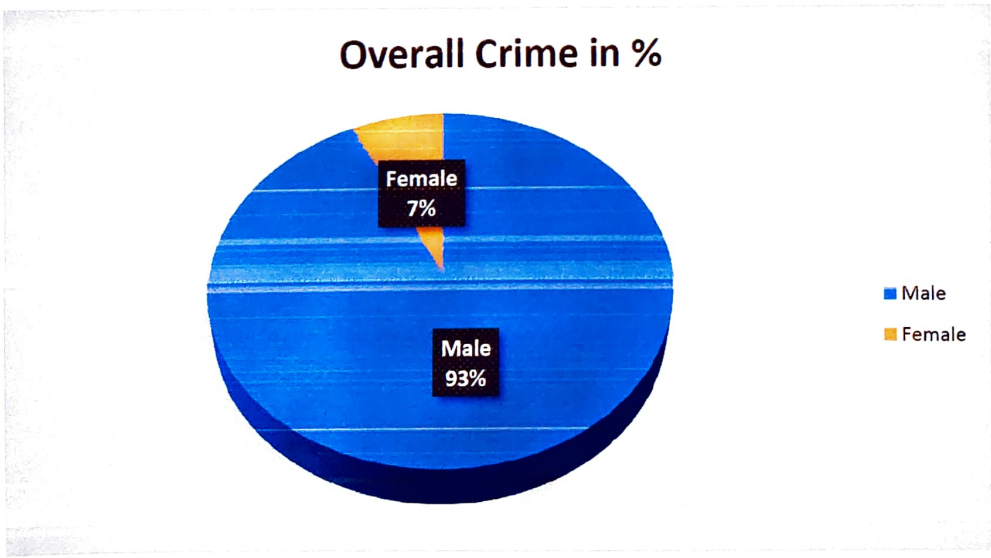
Age wise Major cases in %



In above chart we say that the crime rate of major crimes in age group 25-30 is higher in Laxmipuri, Shahupuri & Juna Rajwada as compared to Rajarampuri. Except Rajarampuri having age group 30 & above



In above chart, we say that more crime rate found in **Shahupuri** area as compared to the Rajarampuri, Juna Rajwade and Laximpuri.



In above chart, we see that 93% males and 7% females are involved in crime

HYPOTHESIS TESTING

A) To test the independency between Gender and Crime.

We state hypothesis as follow:

H_0: Gender and crime are independent

H_1: Gender and crime are not independent. (Level of significance=α=1%)

OBSERVATION TABLE:

Gender	Crime		Total
	Major	Minor	
Male	77	620	697
Female	6	65	71
Total	83	685	N=768

$$\chi^2_{(cal)} = \sum_{i=1}^{4} \frac{(Oi-Ei)^2}{Ei}$$

χ^2(cal)= 7.0874

And $\chi^2_{(tab)} = \chi^2_{(r-1)(s-1).\alpha\%}$

$= \chi^2_{(2-1)(2-1).1\%}$

$\chi^2_{(tab)}$= 6.6348

Therefore, $\chi^2_{(cal)} > \chi^2_{(tab)}$

Conclusion:

Therefore, Gender and crime are dependent

b) To test the independency between Area and Crime.

We state Hypothesis as follows:

H_0 : Area and crime are independent

H_1 : Area and crime are not independent. (Level of significance=α=1%)

OBSERVATION TABLE:

Area	Crime			Total
	Major	Minor	Robbery	
Shahupuri	31	218	266	515
Rajarampuri	17	152	86	255
Laxmipuri	12	151	128	291
Juna Rajawada	21	165	172	358
Total	81	686	652	1419

$$\chi^2_{(cal)} = \sum_{i=1}^{12} \frac{(Oi-Ei)^2}{Ei}$$

$\chi^2_{(cal)} = 25.9926$

And $\chi^2_{(tab)} = \chi^2_{(r-1)(s-1),\alpha\%}$

$= \chi^2_{(3-1)(4-1),1\%}$

$\chi^2_{(tab)} = 16.8118$

Therefore, $\chi^2_{(cal)} > \chi^2_{(tab)}$

Conclusion:

Therefore, Area and crime are dependent

c) To test the independency between Age and Crime.

We state Hypothesis as follow:

H_0 : Age and crime are independent.

H_1 : Age and crime are not independent. (Level of significance=α=1%)

OBSERVATION TABLE:

Age (in year)	Crime		Total
	Major	Minor	
18-20	7	77	84
20-25	23	205	228
25-30	27	138	165
30 & above	25	266	291
Total	82	686	768

$$\chi^2_{(cal)} = \sum_{i=1}^{8} \frac{(Oi-Ei)^2}{Ei}$$

$\chi^2_{(cal)} = 7.488804$

And $\chi^2_{(tab)} = \chi^2_{(r-1)(s-1),\alpha\%}$

$= \chi^2_{(4-1)(2-1),1\%}$

$\chi^2(tab) = 11.3448$

Therefore, $\chi^2_{(cal)} < \chi^2_{(tab)}$

Conclusion:

Therefore, Age and crime are independent

OVERALL CONCLUSION

- We have studied various attributes related to crime and the observed information is plotted by using graphical tools and using Chi-square test of independence to check the independency between crime and age, gender, area & crime data collected from Shahupuri, Juna Rajwada, Laxmipuri & Rajarampuri Police Stations.
- Our study shows that robbery type crime occurs maximum than violence type crime
- In the project study we see that the 93% males and 7% females are involved in crime.
- Middle age group (i.e. 25 to 30) persons are responsible for such crime.
- *It is observed that crime data of overall Kolhapur is independent from 'Age'and not* independent on 'Area' and 'gender.'

OUR VISIT TO POLICE STATIONS IN KOLHAPUR CITY FOR DATA COLLECTION

REFERENCE

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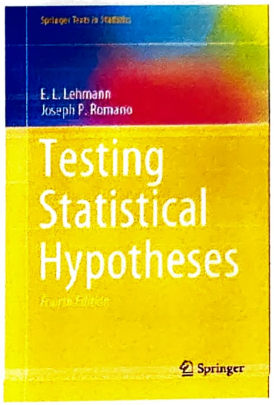

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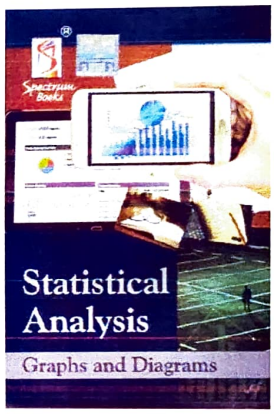

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https://kolhapurpolice.gov.in/