

A PROJECT REPORT
ON
ANALYSIS OF CRIME AGAINST WOMEN
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DEGREE OF MASTERS OF SCIENCE
IN
STATISTICS
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UNDER THE SUPERVISION OF:

Prof. Madhulika Dube
Department of Statistics
BBAU, Lucknow

SUBMITTED BY:

Mansi
Roll No. - 217902



बाबासाहेब भीमराव अम्बेडकर विश्वविद्यालय
Babasaheb Bhimrao Ambedkar University

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CERTIFICATE

This is to certify that the dissertation entitled “**ANALYSIS OF CRIME AGAINST WOMEN**” submitted by **Mansi**, student of M.Sc. (Statistics), IV semester, Department of Statistics, School of Physical and Decision Science, Babasaheb Bhimrao Ambedkar University, Lucknow has completed the necessary academic terms and the work, under my supervision and guidance during the academic session 2021-2023.

This work has not been submitted to any other university or institution for the award of degree or diploma.

DATE :

PLACE:

Prof. Surinder Kumar

Professor & Head
Department of Statistics
BBAU, LUCKNOW

Prof. Madhulika Dube

Supervisor & Professor
Department of Statistics
BBAU, LUCKNOW

DECLARATION

This is to certify that this project report titled “ANALYSIS OF CRIME AGAINST WOMEN” is my original work and has been submitted for partial fulfilment of the course M.Sc. Statistics. This Project report has not been submitted earlier as in full or in part for any other diploma or degree to any other University or Institute to the best of my knowledge.

Submitted by:

Mansi

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Submitted by:

Mansi

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CHAPTER 1

INTRODUCTION

The principle of gender equality is enshrined in the Constitution of India. In order uphold and implement the Constitutional Mandate, the State has enacted various laws and taken measures intended to ensure equal rights, check social discrimination & various forms of violence and atrocities. Although women may be victims of any of the general crimes such as ‘murder’, ‘robbery’, ‘cheating’, etc. only the crimes which are directed specifically against women i.e. gender specific crimes are characterized as ‘Crimes against Women’. Various new legislations have been brought and amendments have been made in existing laws with a view to handle these crimes effectively. These are broadly classified under two categories. Road accidents are the most unwanted thing to happen to a road user, though they happen quite often. The most unfortunate thing is that we do not learn from our mistakes on the road. Most of the road users are quite well aware of the general rules and safety measures while using roads but it is only the laxity on part of road users, which causes accidents and crashes. ‘Crime rate’ for crimes committed against women has been calculated using only the female population which is based on the mid-year projected female population for the year 2015, as supplied by Registrar General of India/Population Commissioner, MHA. Mid-year projected population figures in respect of newly created States of Andhra Pradesh and Telangana have been arrived at using the district population ratio of the Population Census 2011. Violence against women is partly a result of gender relations that assumes men superior to women. Given the subordinate status of women, much of gender violence is considered normal and enjoys social sanction. Manifestations of violence include physical aggression, such as blows of varying intensity, burns, attempted hanging, sexual abuse and rape, psychological violence through insults, humiliation, coercion, blackmail, economic or emotional threats, and control over speech and actions. In extreme, but not unknown cases, death is the result.

These expressions of violence take place in a man-woman relationship within the family, state and society. Usually, domestic aggression towards women and girls, due to various reasons remain hidden. Cultural and social factors are interlinked with the development and propagation of violent behaviour. With different processes of socialization that men and women undergo, men take up stereotyped gender roles of domination and control, whereas

women take up that of submission, dependence and respect for authority. A female child grows up with a constant sense of being weak and in need of protection, whether physical, social or economic. This helplessness has led to her exploitation at almost every stage of life. The family socializes its members to accept hierarchical relations expressed in unequal division of labour between the sexes and power over the allocation of resources. The family and its operational unit is where the child is exposed to gender differences since birth, and in recent times even before birth, in the form of sex-determination tests leading to feticide and female infanticide. The home, which is supposed to be the most secure place, is where women are most exposed to violence. Violence against women has been clearly defined as a form of discrimination in numerous documents. The World Human Rights Conference in Vienna, first recognized gender- based violence as a human rights violation in 1993. In the same year, United Nations declaration, 1993, defined violence against women as “any act of gender based violence that results in, or is likely to result in, physical, sexual or psychological harm or suffering to a woman, including threats of such acts, coercion or arbitrary deprivations of liberty, whether occurring in public or private life”. (Cited by Gomez, 1996).

Radhika Coomaraswamy identifies different kinds of violence against women, in the United Nation’s special report, 1995, on Violence against Women a) Physical, sexual and psychological violence occurring in the family, including battering, sexual abuse of female children in the household, dowry related violence, marital rape, female genital mutilation and other traditional practices harmful to women, non spousal violence and violence related to exploitation. b) Physical sexual and psychological violence occurring within the general community, including rape, sexual abuse, sexual harassment and intimidation at work, in educational institutions and elsewhere, trafficking in women and forced prostitution. c) Physical, sexual and psychological violence perpetrated or condoned by the state, wherever it occurs. This definition added ‘violence perpetrated or condoned by the State’, to the definition by the United Nations in 1993.

Coomaraswamy (1992) points out that women are vulnerable to various forms of violent treatment for several reasons, all based on gender. Because of being female, a woman is subject to rape, female circumcision/genital mutilation, female infanticide and sex related crimes. This reason relates to society’s construction of female sexuality and its role in social hierarchy. Because of her relationship to a man, a woman is vulnerable to domestic violence, dowry murder, and sati. This reason relates to society’s concept of a woman as a property and dependent of the male protector, father, husband, son, etc. Because of the social group to which

she belongs, in times of war, riots. Alternatively, ethnic, caste, or class violence, a woman may be raped and brutalized as a means of humiliating the community to which she belongs. This also relates to male perception of female sexuality and women as the property of men. Combining these types of abuse with the concept of hierarchical gender relations, a useful way to view gender violence is by identifying where the violence towards women occurs.

Essentially, violence happens in three contexts - the family, the community and the state and at each point, key social institutions fulfil critical and interactive functions in defining legitimating and maintaining the violence. The family socializes its members to accept hierarchical relations expressed in unequal division of labour between the sexes and power over the allocation of resources. The community (i.e., social, economic, religious, and cultural institutions) provides the mechanisms for perpetuating male control over women's sexuality, mobility and labour. The state legitimizes the proprietary rights of men over women, providing a legal basis to the family and the community to perpetuate these relations. The state does this through the enactment of discriminatory application of the law.

Gender violence have been divided into four major categories

- Overt physical abuse (battering sexual assault, at home and in the work place)
- Psychological abuse (confinement, forced marriage)
- Deprivation of resources for physical and psychological wellbeing (health/nutrition, education, means of livelihood)
- Commoditization of women (trafficking, prostitution)

Two basic forms of violence, that is structural and direct, structural violence arises from the dominant political, economic and social systems, in so far as they block access to the means of survival for large number of people; for example, economic models based on the super-exploitation of thousands for the benefit of a few, extreme poverty in opposition to ostentatious wealth, and repression and discrimination against those who diverge from given norms. Structural violence according is the basis of direct violence, because it influences the socialization, which causes individuals to accept or inflict suffering, according to the social they fulfil. Open or direct violence is exercised through aggression, arms or physical force.

The Fourth Conference of Women, 1995 has defined violence against women as a physical act of aggression of one individual or group against another or others. Violence against women is any act of gender-based violence, which results in, physical, sexual or arbitrary deprivation of

liberty in public or private life and violation of human rights of women in violation of human rights of women in situations of armed conflicts. (Conference on Women, Beijing, 1995 Country Report). Violence is an act carried out with the intention or perceived intention of physically hurting another person (Gelles and Straus, 1979). Gender Violence is defined as “any act involving use of force or coercion with intent of perpetuating promoting hierarchical gender relations”. Adding gender dimension to that definition amplifies it to include violent acts perpetrated on women because they are women. With this addition, the definition is no longer simple or obvious. Understanding the phenomenon of gender violence requires an analysis of the patterns of violence directed towards women and the underlying mechanisms that permit the emergence and perpetuation of these patterns. Liz Kelly (1998), *Surviving Sexual Polity* has defined violence as “any physical, visual, verbal or sexual act that is experienced by the woman or girl at the time or later as a threat, invasion or assault, that has the effect of hurting her or degrading her and/or takes away her ability to contest an intimate contact”. Dr Joanne Liddell modified this definition as “any physical, visual, verbal or sexual act that is experienced by the person at the time or later as a threat, invasion or assault, that has the effect of hurting or disregarding or removing the ability to control one’s own behaviour or an interaction, whether this be within the workplace, the home, on the streets or in any other area of the community”.

Crime Heads under the Indian Penal Code (IPC)

1. Rape (Sec. 376 IPC)
2. Attempt to commit Rape (Sec 376/511 IPC)
3. Kidnapping & Abduction of Women (Section 363, 364, 364A, 365, 366 to 369 IPC)
 - K&A under section 363 IPC
 - K&A in Order to Murder
 - K&A for Ransom
 - K&A of Women to Compel Her for Marriage
 - K&A for Other Purposes
4. Dowry Deaths (Section 304B IPC)
5. Assault on Woman with Intent to Outrage Her Modesty (Sec. 354 IPC)
 - Sexual Harassment (Sec.354A IPC)

- Assault on Woman with Intent to Outrage her Modesty (Sec. 354C IPC)
- Voyeurism (Sec. 354D IPC)
- Others

6. Insult to the Modesty of women (Sec. 509 IPC)

- At Office Premises
- At Places Related to Work
- In Public Transport
- In Other Places

7. Cruelty by husband or his relatives

THE PROBLEM CONSIDERED & TECHNIQUE USED

The data consists of list of all states and union territories along with the number of deaths in that particular place from year 2001-2014 and deaths occurring due to factors that include Rape, Dowry Death etc.

The aim of the study is to:

- See and review the area in graphical and pictorial form.
- Compare various variables by plotting bar charts or pie charts and by using a heat map of India And machine learning.

The data exploration and analysis of the data is done using Python language and some add-ons, which are used to predict and create random models. The statistical techniques used are different types of libraries for goodness of fit, exploratory data analysis using charts and getting the prediction from the database.

ABOUT THE DATA

This dataset contains complete information about various aspects of crimes happening in India from 2001. Many factors can be analysed from this dataset. Overall, this dataset helps us to understand better about India.

I: Cases Reported and their Disposal by Police and Court

- Indian Penal Code
 - Special & Local Laws
- IA: SC/ST Cases Reported and their Disposal by Police and Court
 - Crime against SCs
 - Crime against STs
- IB: Children Cases Reported and their Disposal by Police and Court
 - Abetment of Suicide (Section 305 IPC)
 - Buying of Girls for Prostitution (Section 373 IPC)
 - Child Marriage Restraint Act, 1929
 - Exposure and Abandonment (Section 317 IPC)
 - Feticide (Section 315 and 316 IPC)
 - Infanticide (Section 315 IPC)
 - Kidnapping & Abduction (Section 360,361,363,363-A, 363 read with Section 384, 366, 367 & 369 IPC)
 - Murder (Section 302, 315 IPC)
 - Other Crimes against Children
 - Other Murder of Children (Section 302 IPC)
 - Procurement of Minor Girls (Section 366-A IPC)
 - Rape (Section 376 IPC)
 - Selling of Girls for Prostitution (Section 372 IPC)
 - Total Crimes against Children

- **II: Persons Arrested and their Disposal by Police and Court**
 - Indian Penal Code
 - Special and Local Laws
- **IIA: SC/ST Persons Arrested and their Disposal by Police and Court**
 - Crime against SCs
 - Crime against STs
- **IIB: Children Persons Arrested and their Disposal by Police and Court**
 - Abetment of suicide (Section 305 IPC)
 - buying of girls for prostitution (Section 373 IPC)
 - Child Marriage Restraint Act, 1929
 - Exposure and Abandonment (Section 317 IPC)
 - Feticide (Section 315 and 316 IPC)
 - Kidnapping & Abduction (Section 360,361,363,363-A, 366, 367 & 369 IPC)
 - Murder - Infanticide (Section 315 IPC)
 - Murder - Other Murder of Children
 - Murder (Section 302, 315 IPC)
 - Other Crimes against Children
 - Procurement of minor girls (Section 366-A IPC)
 - Rape (Section 376 IPC)
 - selling of girls for prostitution (Section 372 IPC)
 - Total Crimes against Children
- **IV: Persons Arrested by Sex and Age Group**
 - Indian Penal Code
 - Special & Local Laws
- **V: Juveniles Apprehended**
 - Indian Penal Code
 - Special & Local Laws
- **VI: Juveniles Arrested and their Disposal**
- **VII: Property Stolen & Recovered (Crime Head)**
 - Dacoit

- Robbery
- Burglary
- Theft
- Criminal Breach of Trust
- Other Property
- Total Property Stolen & Recovered
- VIII: Property Stolen & Recovered (Nature of Property)
 - Communication and Electricity Wire
 - Cattle
 - Cycle
 - Motor Vehicles
 - Motor Vehicles – Motor Cycle/Scooters
 - Motor Vehicles - Motor Car/Taxi/Jeep
 - Motor Vehicles - Other Motor Vehicles
 - Fire Arms
 - Explosives/Explosive Substances
 - Electronic Components
 - Cultural Property including Antiques
 - Other kinds of Property
 - Total Property Stolen & Recovered
- IX: Police Strength (Actual & Sanctioned)
 - A) Actual Civil Police (Incl. District Armed Police and Women Police)
 - A) Actual Armed Police (Incl. Women Police)
 - A) Actual Police Strength (Incl. Women)
 - B) Actual Women Civil Police (Incl. District Armed Force)
 - B) Actual Women Armed Police
 - B) Actual Women Police Strength
 - C) Sanctioned Civil Police (Incl. District Armed Police)
 - C) Sanctioned Armed Police (Incl. Women Police)
 - C) Sanctioned Police Strength (Incl. Women)

- D) Sanctioned Women Civil Police (Incl. District Armed Police)
- D) Sanctioned Women Armed Police
- D) Sanctioned Women Police Strength
- X: Police Personnel Killed or Injured on duty
 - Constables
 - Head Constables
 - Assistant Sub-Inspector
 - Sub-Inspectors
 - Inspectors
 - Gazette Officers
 - Total Police Killed or Injured
- X-B: Age Profile of Police Personnel Killed on Duty
- X-C: Natural Deaths and Suicides of Police Personnel
 - Natural Deaths of Police Personnel (while in service)
 - Police Personnel Committed Suicide
- XI: Casualties under Police Firing and Lathi Charge
 - Riot Control
 - Anti Dacoit Operations
 - Against Extremists & Terrorists
 - Against Others
 - Total Casualties
- XII: Cases Reported Value of Property Stolen under Dacoity, Robbery, Burglary and Theft by Place of Occurrence
 - Residential Premises
 - Highways
 - River and Sea
 - Railways
 - 4.1 In Running Trains
 - 4.2 Others
 - Banks

- Commercial Establishments (Shops etc.)
- Other Places
- Total
- XIII: Particulars of Juveniles Arrested
 - Education
 - Economic Setup
 - Family Background
 - Recidivism
- XIV: Motive/Cause of Murder and Culpable Homicide not amounting to Murder
 - Incest Rape Cases"
 - Other Rape Cases (Other than Incest)
 - Total Rape Cases
- XV-A: Rape Offenders relation, nearness to Rape Victims
- XVI: Persons Arrested under Recidivism
- XVII: Anti-Corruption - Cases
- XVIII: Anti-Corruption - Arrests
- XIX: Complaints/Cases against Police Personnel
 - Complaints Received/Cases Registered
 - Police Personnel Involved/Action Taken
 - Departmental Action/Punishments
- *XX: Police Budget and Infrastructure
 - Equipments and Transport Support
 - Distribution of Police Stations by Crime Incidences
 - Distribution of Police Stations by Police Strength
 - Organizational Set Up
 - SCs/STs and Muslims in Police Force (Actual)
- XXI: 1. Nature of Complaints Received by Police
- XXI: 2. Trial of Violent Crimes by Courts

- Murder
- Attempt to Murder
- C H Not Amounting to Murder
- Rape
- Kidnapping & Abduction

5.1 Kidnapping & Abduction of Women & Girls

5.2 Kidnapping & Abduction of Others

- Dacoity
- Preparation & Assembly for Dacoity
- Robbery
- Riots
- Arson
- Dowry Deaths
- Total Trials (Sum of 1-11 Above)

● XXI: 3. Period of Trials by Courts

- District/Session Judge
- Additional Session Judge
- Chief Judicial Magistrate
- Judicial Magistrate (I)
- Judicial Magistrate (II)
- Special Judicial Magistrate
- Other courts

○ Total Trials (Sum of 1-7 Above)

● XXI: 4.1 Auto Theft (Stolen & Recovered)

- Motorcycles/ Scooters
- Motor Car/Taxi/Jeep
- Buses
- Goods carrying vehicles (Trucks/Tempo etc.)
- Other Motor vehicles
- Total (Sum of 1-5 Above)

- XXI: 4.2 Serious Fraud
 - Criminal Breach of Trust
 - Cheating
- XXI: 5.1 Victims of Murder (Age & Sex-Wise)
 - Male Victims
 - Female Victims
 - Total
- XXI: 5.2 Victims of CH not Amounting to Murder (Age & Sex-wise)
 - Male Victims
 - Female Victims
 - Total
- XXI: 5.3 Use of Fire Arms in Murder Cases
- XXI: 6. Human Rights Violation by Police
 - Disappearance of Persons
 - Illegal Detention/Arrests
 - Fake Encounter Killings
 - Violation against Terrorists/Extremists
 - Extortion
 - Torture
 - False Implication
 - Failure in Taking Action
 - Indignity to Women
 - Atrocities on SC/ST
 - Others
 - Total (Sum of 1-11 Above)
- XXI: 7. Police Housing
 - For Officers (Dy. SP & Above)
 - Upper Subordinates (ASI to Inspectors)
 - Lower Subordinates (Constables, Head Constables & Class-IV Subordinate Staff)

- XXI: 8. Home Guards and Auxiliary force
- XXI: 9. Unidentified Dead Bodies Recovered & Inquest conducted
- XXI: 10. Victims of Kidnapping & Abduction for Specific Purpose
 - For Adoption
 - For Begging
 - For Camel Racing
 - For Illicit Intercourse
 - For Marriage
 - For Prostitution
 - For Ransom
 - For Revenge
 - For Sale
 - For Selling Body Parts
 - For Slavery
 - For Unlawful Activity
 - Other Purposes
 - Total (Sum of 1-13 Above)
- XXI: 11. Custodial Deaths
 - Deaths in Custody/Lockup of Persons Remanded to Police Custody by Court
 - Deaths in Custody/Lockup of Persons Not Remanded to Police Custody by Court
 - Deaths in Custody during production/process in courts/journey connected with investigation
 - Deaths during Hospitalization/Treatment
 - Deaths due to Other Reasons
- XXI: 12. Escapes from Police Custody
- Cases under Crime against Women
 - Rape
 - Kidnapping & Abduction of Women & Girls
 - Dowry Deaths
 - Molestation
 - Sexual Harassment

- Cruelty by Husband and Relatives
- Importation of Girls
- Immoral Traffic Prevention Act, 1956
- Dowry Prohibition Act, 1961
- Indecent Representation of Women (Prohibition) Act, 1986
- Sati Prevention Act, 1987
- Total Crimes against Women
- Arrests under Crime against Women
- Rape
- Kidnapping & Abduction of Women & Girls
- Dowry Deaths
- Molestation
- Sexual Harassment
- Cruelty by Husband and Relatives
- Importation of Girls
- Immoral Traffic Prevention Act, 1956
- Dowry Prohibition, 1961
- Indecent Representation of Women (Prohibition) Act, 1986
- Sati Prevention Act, 1987
- Total Crimes against Women

Some of the data contains district level data. The districts are police districts and include a special police unit. Therefore, these may be different from revenue districts.

Inspiration

There could be many things one can understand by analysing this dataset. Few inspirations for you to start with.

- What is the major in our country of crime and to highlight the high crime area?
- What are the trends of total crime and each type of crime over year 2001 to 2014?
- Which state has more crime against women?

- According to high crime area, what prevention can be taken based on the type of crime being taken in that area.

The data consists of:

- DISTRICT
- Year
- Rape
- Kidnapping and Abduction
- Dowry Deaths
- Assault on women with intent to outrage her modesty
- Insult to modesty of Women
- Cruelty by Husband or his Relatives
- Importation of Girls
- STATE/UT

Arrest Under crime against women -:

- Kidnapping & Abduction of Women & Girls
- Dowry Deaths
- Molestation
- Sexual Harassment
- Cruelty by Husband and Relatives
- Importation of Girls
- Immoral Traffic Prevention Act, 1956
- Dowry Prohibition, 1961
- Indecent Representation of Women (Prohibition) Act, 1986
- Sati Prevention Act, 1987
- Total Crimes against Women

Some of the data contains district level data. The districts are police districts and include a special police unit. Therefore, these may be different from revenue districts. Some of these variables are only there for informational purposes and were not included in this analysis.

2.2 METHODOLOGY USED

PYTHON LIBRARIES NEEDED

a. Pandas

The panda is an open-source library and BSD licensed. The library is widely used in the data science area. They are mostly used for the analysis, manipulation, and cleaning of data. Without the need for switching it to another language like R, panda makes it possible for the easy operations of modelling and data analysis.

b. NumPy

Deviating towards the scientific computation areas, NumPy is the most used open-source packages offered by python. It supports large matrices and multidimensional data and has inbuilt mathematical functions for easy computation. The name “NumPy” defines “Numerical Python”. It can be used in linear algebra, random number capability, etc., and can act as a multi-dimensional container for generic data. Python NumPy Array is an object defining N-dimensional array in the form of rows and columns.

NumPy is preferred over lists in python because of:

- Less memory
- Fast
- Convenient
- Installation

c. Matplotlib

This library is used for the plotting of numerical data and used in data analysis. This open-source library is used for publishing high-quality figures like graphs, pie charts, scatterplots, histograms, etc.

d. Seaborn

The package can be used for the visualization of the statistical models. The library is based on Matplotlib and allows the creation of statistical graphics through:

- Comparison of variables through an API based on datasets.
- Easy generation of complex visualization supporting multi-plot grids.
- Comparison of data subsets through Univariate and bivariate visualizations.
- Options of various colour palettes to display the patterns.
- Automatic estimation of linear regression and its plotting.

Logistic Regression

Logistic regression is one of the most prevalent Machine Learning algorithms, which comes under the Supervised Learning technique. It is used for predicting the categorical dependent variable using a certain set of independent variables. Logistic Regression is related to the Linear Regression except that how they are used. Linear Regression is used for solving Regression problems, whereas Logistic regression is used for solving the classification problems. Logistic regression predicts the output of a categorical dependent variable. Therefore, the outcome must be a categorical or discrete value. It can be either Yes or No, 0 or 1, True or False, etc. but instead of giving the exact value as 0 and 1, it gives the probabilistic values, which lie between 0 and 1. Logistic Regression is a significant machine-learning algorithm since it has the ability to provide probabilities and classify new data using continuous and discrete datasets. In Logistic regression, instead of fitting a regression line, we fit an "S" shaped logistic function, which predicts two maximum values (0 or 1). The curve from the logistic function indicates the likelihood of something such as whether the cells are cancerous or not, a mouse is obese or not based on its weight, etc.

EXPERIMENTS PERFORMED

Working with secondary data and I was very enthusiastic when I got this chance. By conducting this project I came to know about different programs that are conducted by various agencies for collecting data like ministry of crime, annual family health survey (AHS), Dept. of Census Commissioner & Registrar General of India etc. Through this project, I also got a chance to know clearly, about how much crime against women takes place in India even though there is always the saying of new rules but no one follows it. I experimented with the data using Python. While conducting this project, I have seen some basic things and tried some basic things to analyse the data better.

- Seaborn library - When I got my project topic, I started finding some of the best libraries available and then I came across the seaborn library. This library helped me in visualization in depth.
- Gone for some basic data-: When I started the research about this database and this project, the one thing, which I have decided at that time, is I will go for basic data. I can add some good graphs and extremely hard data but this topic needs to be analysed using simple data and machine learning.
- choosing this database-: While searching for a database, I came across some good and basic databases but this database attracted me just for one reason - the richness of data in this database. This is literally an experiment for me because this database has some data, which is disturbing and full of crimes, which should be analysed by the students so they can get a better understanding about the crimes.

DATA LOADING

This data is collated from <https://data.gov.in>. It has state-wise and district level data on the various crimes committed against women between 2001 to 2014. Some crimes that are included are Rape, Kidnapping and Abduction, Dowry Deaths etc.

The data refers to State/UT wise crime committed against women categorized by different crime heads during the years. The different crime heads covered are Rape, Kidnapping And Abduction, Dowry Deaths, Assault On Women With Intent To Outrage Her Modesty, Insult To The Modesty Of Women, Cruelty By Husband Or His Relatives (IPC Section 498A), Importation Of Girls From Foreign Country.

VARIABLE DESCRIPTION

STATE/UT	object	State in which crime has occurred.
District	object	District of crime.
Year	int64	In which year crime has occurred.
Rape	int64	Number of rape occurred in particular year in particular district and state
Kidnapping and Abduction	int64	Number of Kidnapping and Abduction occurred in particular year in

		particular district and state
Dowry Deaths	int64	Number of Dowry Deaths occurred in particular year in particular district and state
Assault on women with intent to outrage her modesty	int64	Number of Assault on women with intent to outrage her modesty occurred in particular year in particular district and state
Insult to modesty of Women	int64	Number of Insult to modesty of Women occurred in particular year in particular district and state
Cruelty by Husband or his Relatives	int64	Number of Cruelty by Husband or his Relatives occurred in particular year in particular district and state
Importation of Girls	int64	Number of Importation of Girls occurred in particular year in particular district and state

DATA PREPROCESSING

- Recognizing number of states or union territories with
- duplicates we have in Data
- Number of states/territories with duplicates: 72
- Removed and checked number of states or union territories
- without duplicates we have in Data
- Number of states/territories without duplicates: 36
- Checked whether there are any null values present.

CHAPTER 3

TABULATION AND ANALYSIS OF DATA

3.1 YEAR BY YEAR ANALYSIS

After taking sum of each type of crime with respect to each year, got the outcome.

Year	Rape	Kidnapping and Abduction	Dowry Deaths	Assault on women with intent to outrage her modesty	Insult to modesty of Women	Cruelty by husband or his Relatives	Importation of Girls	total_crimes
2001	32150	29290	13702	68248	19492	98340	228	261450
2002	32746	29012	13644	67886	20310	98474	152	262224
2003	31694	26592	12416	65878	24650	101406	92	262728
2004	36466	31156	14052	69134	20002	116242	178	287230
2005	36718	31500	13574	68350	19968	116638	298	287046
2006	38696	34828	15236	73234	19932	126256	134	308316
2007	41474	40832	16186	77468	21900	151860	122	349842
2008	42934	45878	16344	80826	24428	162688	134	373232
2009	42794	51482	16766	77422	22018	179092	96	389670
2010	44344	59590	16782	81226	19922	188082	72	410018
2011	48412	71130	17236	85936	17140	198270	160	438284
2012	49846	76524	16466	90702	18346	213054	118	465056
2013	67414	103762	16166	141478	25178	237732	62	591792
2014	73470	114622	16910	164470	19470	245754	26	634722

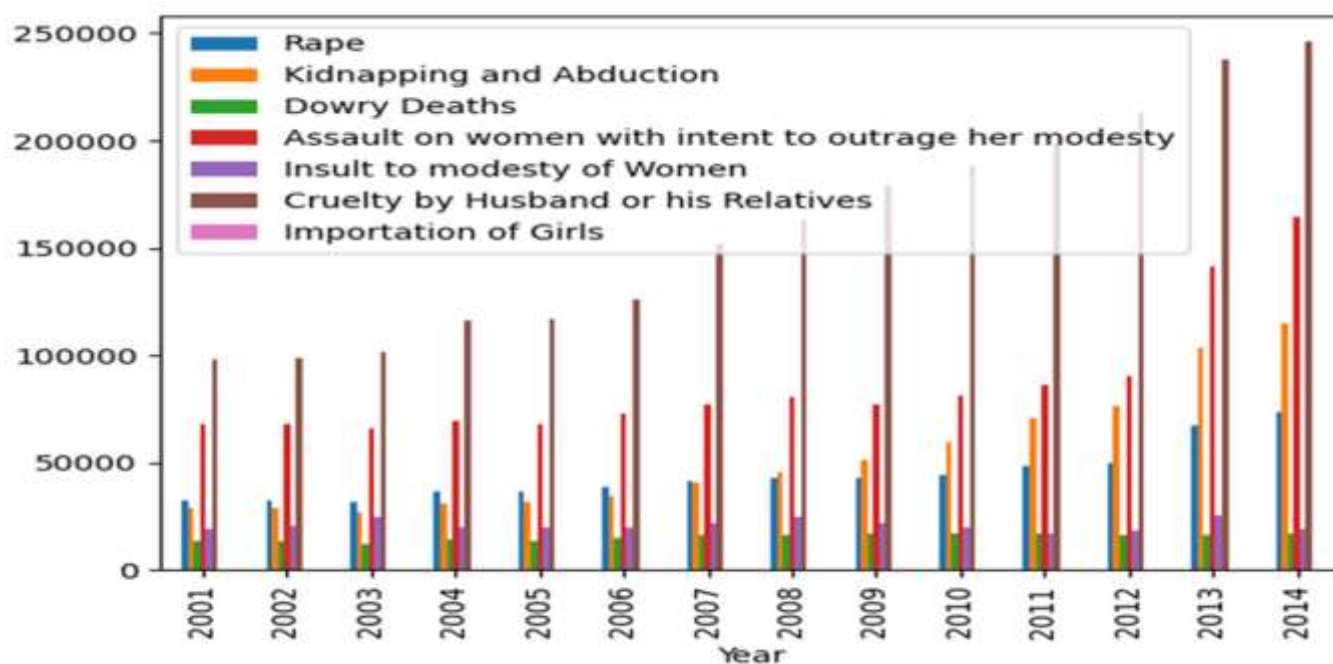


FIGURE 3.1.1 TOTAL NUMBER OF CRIMES IN EACH YEAR

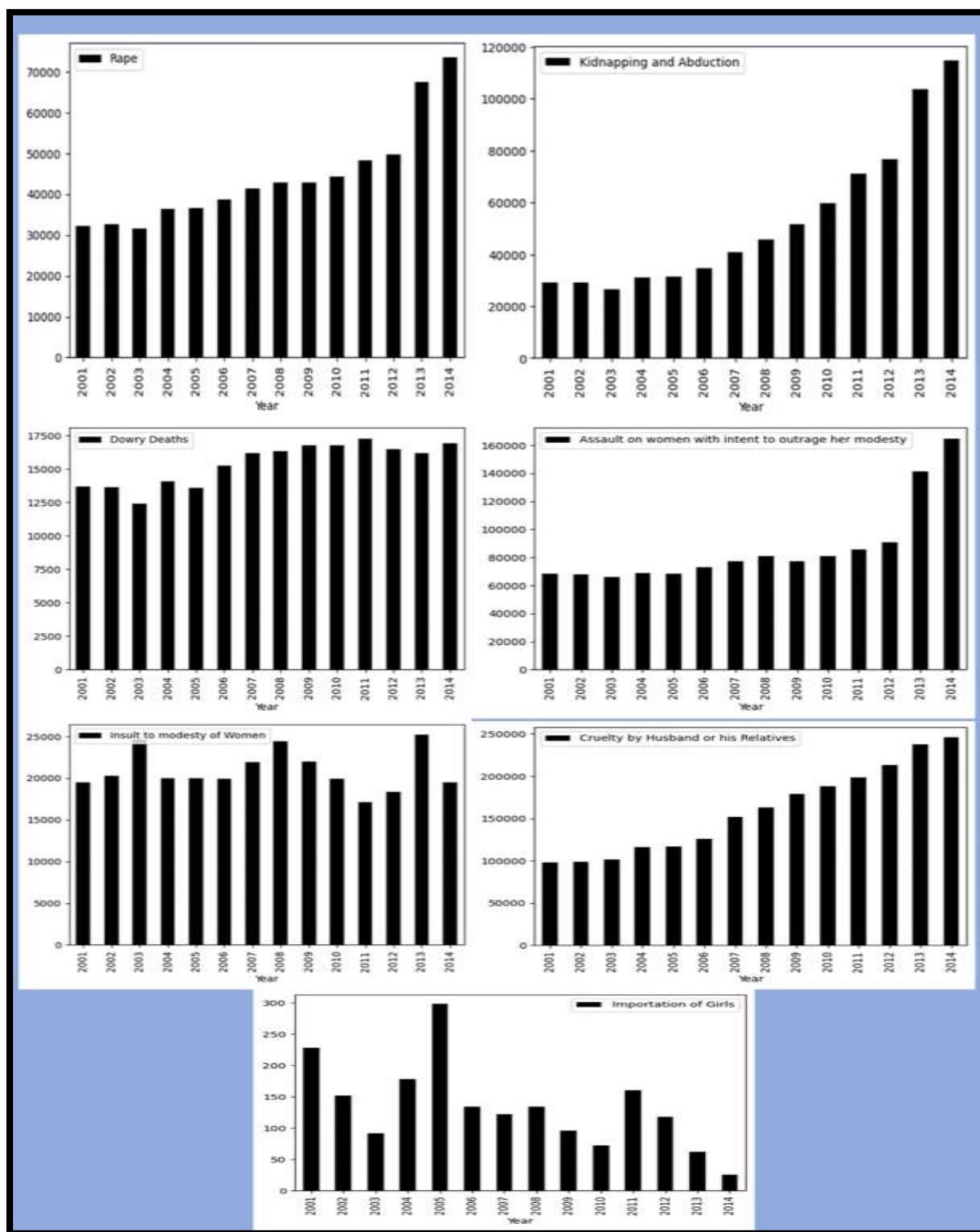


FIGURE 3.1. 2. HOW EACH CRIME VARYING YEAR BY YEAR

On observing above plot 1 we see the increase in number of crime year by year in maximum type of crime, on the other hand importation of girls decreased while on visualizing each variable individually features such as rape, kidnapping and abortion, Cruelty by Husband or his Relatives, Assault on women with intent to outrage her modesty were increasing exponentially in India and can be clearly seen from plot given below.

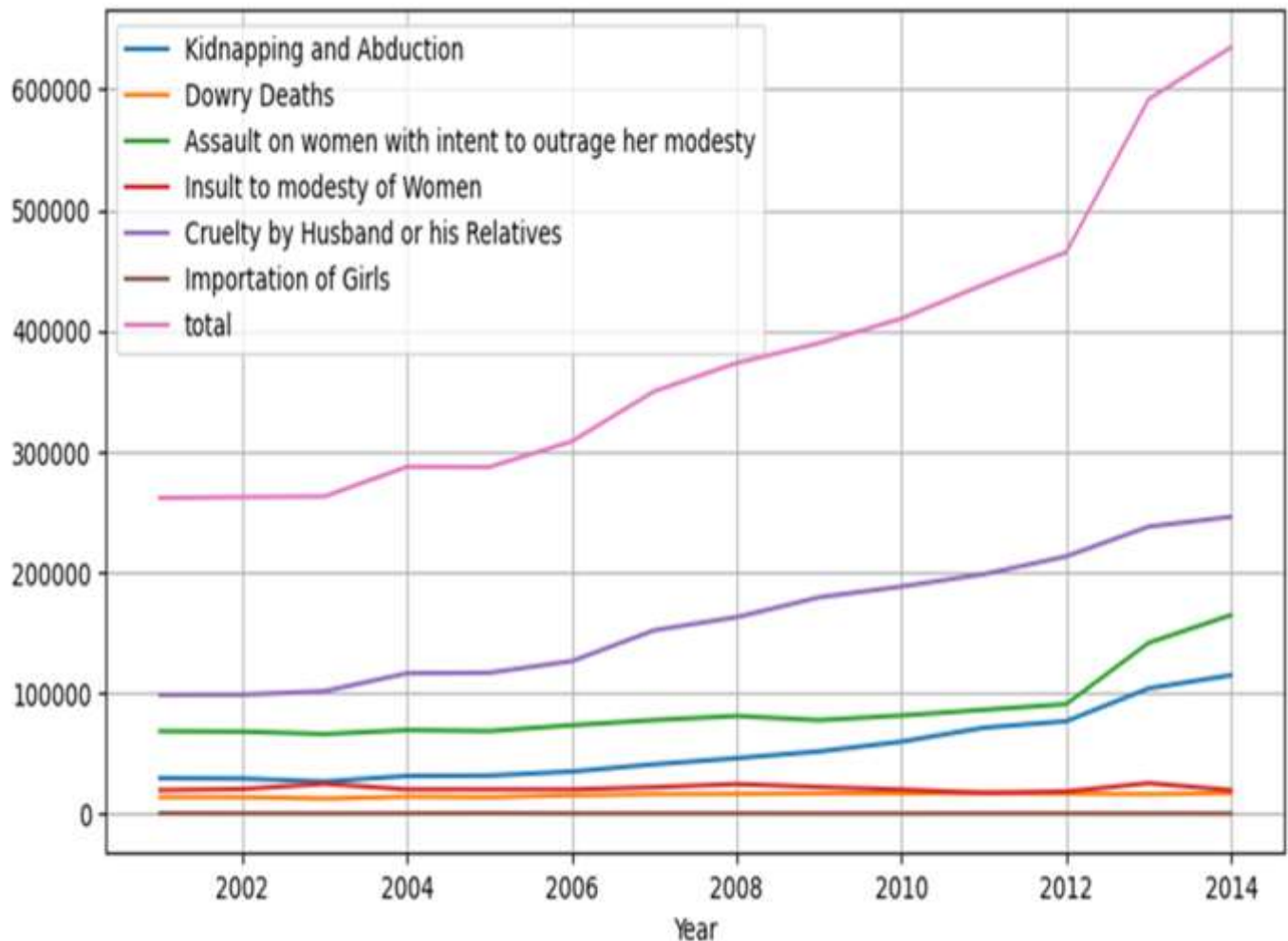


FIGURE 3.1.3. CRIME RATE AGAINST WOMEN IN INDIA

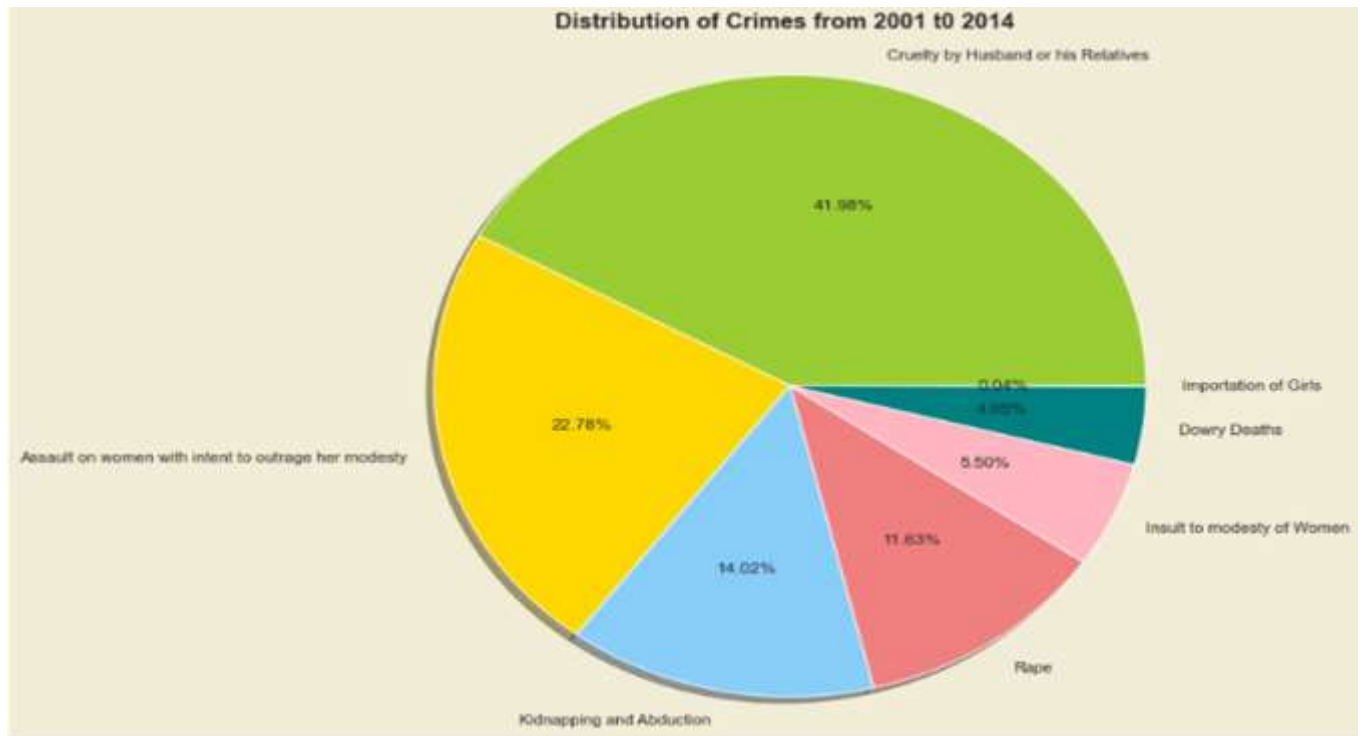


FIGURE 3.1.4. TOTAL NUMBER OF EACH CATEGORY CRIME 2001 TO 2014

Maximum chart area was covered by crime named Cruelty by husband or his relative around 41.56% followed up by assault on women with intent to outrage her modesty 22.78%, kidnapping and abduction 14.02%, rape around 11.63%, insult and modesty of women 5.50%, deaths are 4.05% and importation of girls was 0.04%.

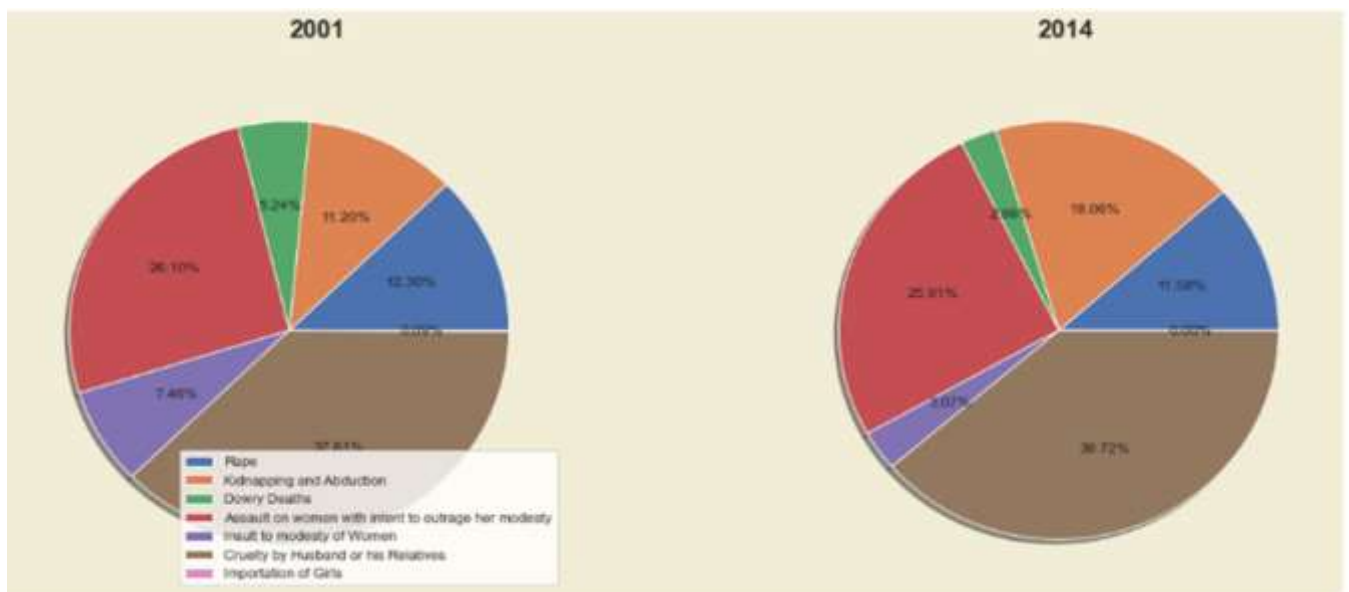


Figure 1.5. COMPARISON BETWEEN 2001 AND 2014

The above pie charts are showing comparison between the crime in 2001 and 2014.

During this period rape and cruelty by husband or relatives, crime has not shown significant change from year 2001 to 2014. On the other hand kidnapping and abduction has shown 61.25%. Dowry deaths has shown decrement of 49.23% while assault of women has minor change. Insult to the modesty has also shown decrement of 58.8% from 2001 to 2014.

3.2. STATE BY STATE ANALYSIS

3.2.1. Each category of crimes in each state from 2001 to 2014

```
<ipython-input-19-1ea4089ee0d8>:3: FutureWarning: Dropping of nuisance columns in DataFrame reductions (with 'numeric_only=None') is deprecated; in a future version this will
df['total'] = df7.sum(axis=1)
```

	STATE/UT	Rape	Kidnapping and Abduction	Dowry Deaths	Assault on women with intent to outrage her modesty	Insult to modesty of women	Cruelty by Husband or his Relatives	Importation of Girls	total
0	Andaman & Nicobar Islands	336	212	20	600	112	288	0	1568
1	Andhra Pradesh	32150	34504	13844	126952	86964	280906	34	575354
2	Arunachal Pradesh	1316	1470	6	1996	48	476	0	5312
3	Assam	40190	62074	3268	38256	254	115300	22	259364
4	Bihar	30758	57086	32206	16958	694	69770	904	208376
5	Chandigarh	770	1682	90	1088	342	2080	0	6052
6	Chhattisgarh	29308	11608	2758	47096	3968	23436	12	118386
7	D&N Haveli	132	224	2	106	12	90	0	566
8	Daman & Diu	60	44	6	40	4	76	0	230
9	Delhi UT	20312	46586	3758	30742	7928	42834	2	152162
10	Goa	1062	640	38	1384	468	532	0	4124
11	Gujarat	11644	34670	1108	23186	3230	146468	0	220306
12	Haryana	17110	20016	7372	17142	17866	68414	4	147924
13	Himachal Pradesh	4674	4116	112	9256	1220	7796	0	27174
14	Jammu & Kashmir	7038	21164	294	28638	9168	5390	0	71692
15	Jharkhand	22826	14186	7896	9898	566	23910	298	79580
16	Karnataka	15056	16262	7016	65750	2276	72706	94	179160
17	Kerala	20030	4452	700	80438	7930	111626	0	225176
18	Lakshadweep	20	2	0	14	4	14	0	54
19	Madhya Pradesh	90996	35608	21090	195478	20964	102816	134	467086
20	Maharashtra	48374	30368	3696	114794	32834	183022	6	423084
21	Mangpur	1368	2806	6	1322	6	578	0	5986
22	Meizhale	2542	678	36	1470	124	460	6	5470
23	Mizoram	2072	30	8	1988	70	134	6	4306
24	Nagaland	362	190	2	260	24	32	2	1072
25	Odisha	30480	20888	12782	80214	7488	49036	36	203754
26	Puducherry	208	306	36	1314	888	234	6	2716
27	Punjab	14636	10096	3524	12410	1728	30840	4	78298
28	Rajasthan	40864	86278	11854	83062	734	362300	14	473186
29	Sikkim	578	180	4	586	34	108	0	1482
30	Tamil Nadu	19080	30908	3080	40404	21172	48524	30	162758
31	Telangana	1368	1422	678	6376	2284	12738	0	25386
32	Tripura	3060	2260	752	7344	914	16086	0	31508
33	Uttar Pradesh	81130	138806	87286	91212	53130	183738	6	382286
34	Uttarakhand	3752	6484	1574	4364	2190	9794	2	23924
35	West Bengal	47876	81158	12338	86908	5548	344124	254	537576

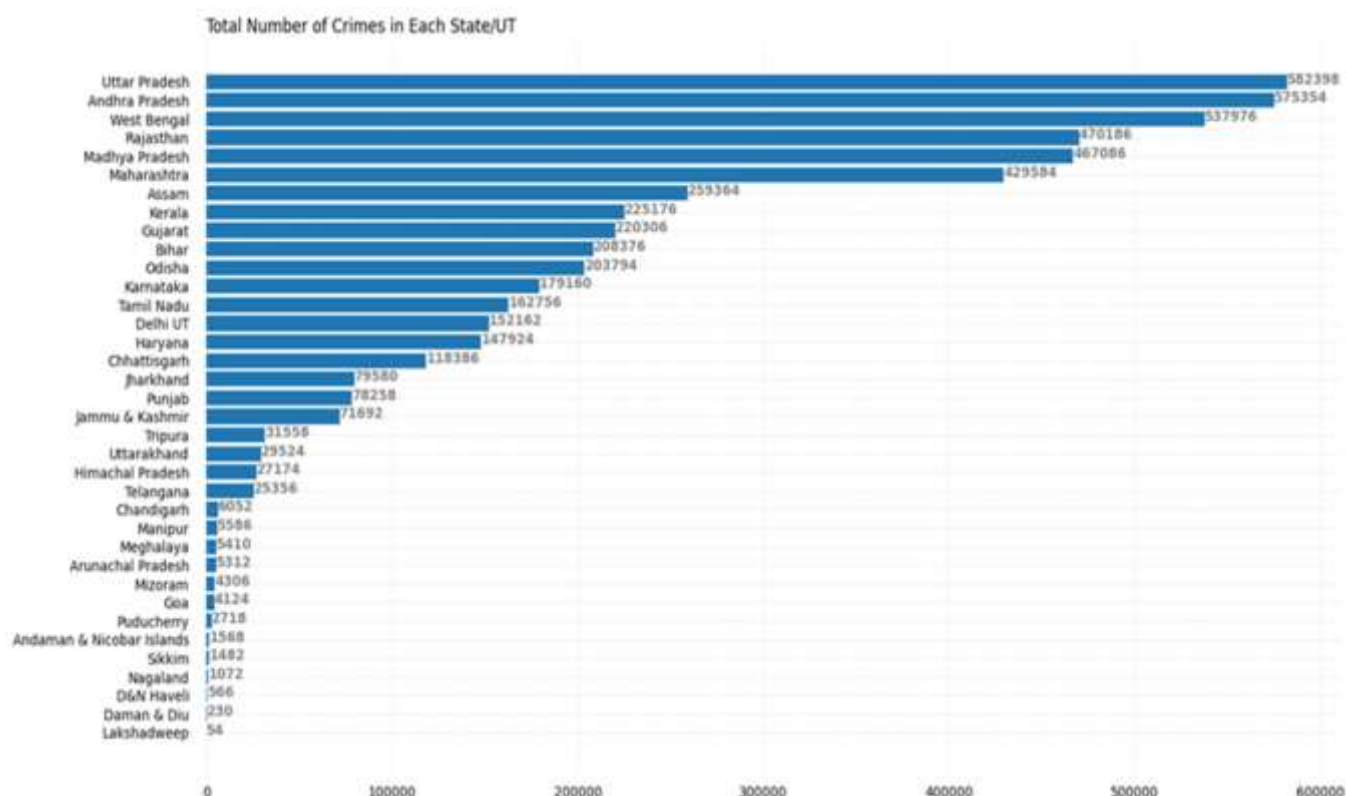


FIGURE 3.2.2 TOTAL NUMBER OF CRIMES IN EACH STATE/UT

TOP FIVE STATES/UT WITH HIGHEST CRIME RATES 2001 TO 2014

1. Uttar Pradesh
2. Andhra Pradesh
3. West Bengal
4. Rajasthan
5. Madhya Pradesh

	STATE/UT	Rape	Kidnapping and Abduction	Dowry Deaths	Assault on women with intent to outrage her modesty	Insult to modesty of Women	Cruelty by Husband or his Relatives	Importation of Girls	total
33	Uttar Pradesh	51150	135906	57256	91212	53130	193738	6	582398
1	Andhra Pradesh	32150	34504	13844	126862	86964	280906	34	575354
35	West Bengal	47876	61158	12308	66908	5348	344124	254	537976
28	Rajasthan	45684	66278	11854	83362	794	262200	14	470186
19	Madhya Pradesh	90996	36808	21090	195478	20964	102816	134	467086

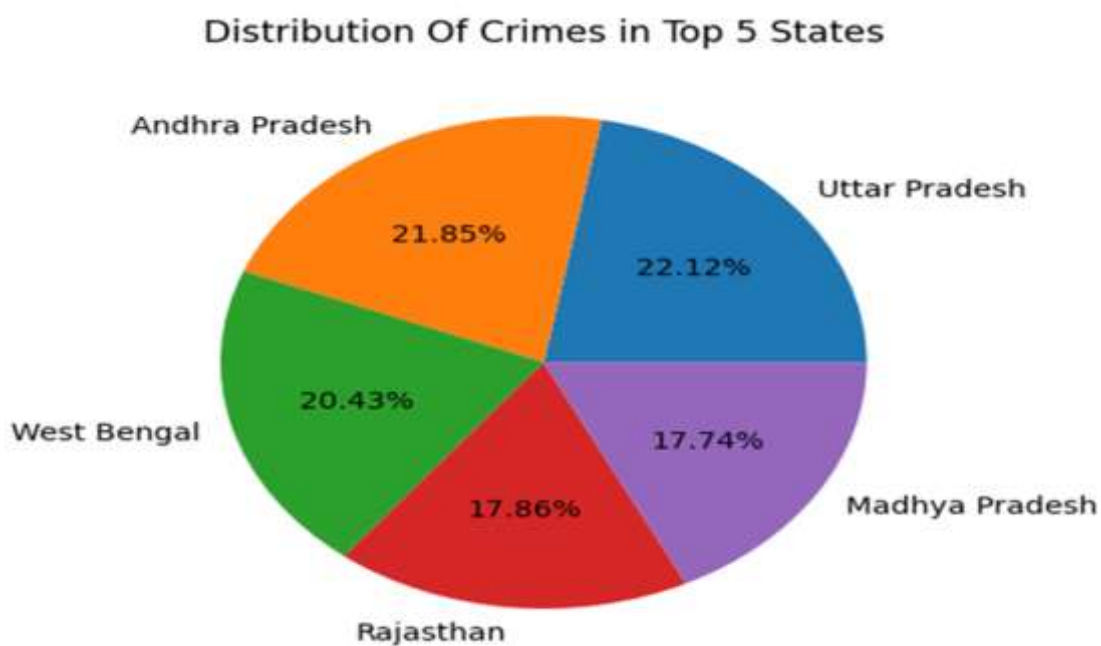


FIGURE 3.2.3 DISTRIBUTION OF CRIME IN TOP 5 STATES

FIVE STATES/UT WITH LEAST CRIME RATES 2001 to 2014

1. Sikkim
2. Nagaland
3. D&N haveli
4. Daman & Diu
5. Lakshadweep

	STATE/UT	Rape	Kidnapping and Abduction	Dowry Deaths	Assault on women with intent to outrage her modesty	Insult to modesty of women	Cruelty by Husband or his Relatives	Importation of Girls
18	Lakshadweep	20	2	0	14	4	14	0
8	Daman & Diu	60	44	6	40	4	76	0
7	D&N Haveli	132	224	2	106	12	90	0
24	Nagaland	562	190	2	260	24	32	2
29	Sikkim	570	180	4	586	34	108	0

Distribution Of Crimes in least Top 5 States

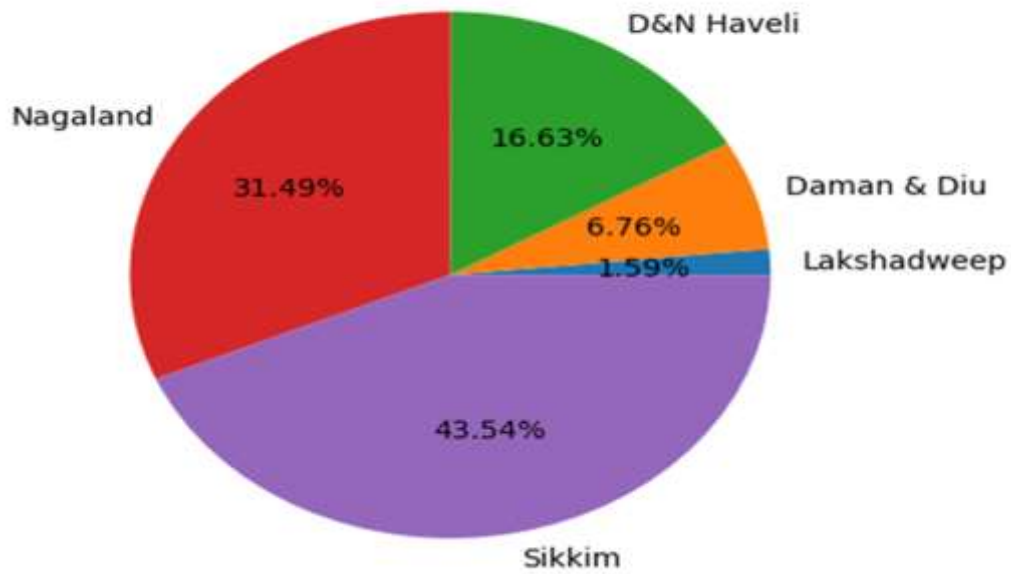


FIGURE 3.2.4 DISTRIBUTION OF CRIME IN LEAST TOP 5 STATES

Top 5 States With Highest Rape

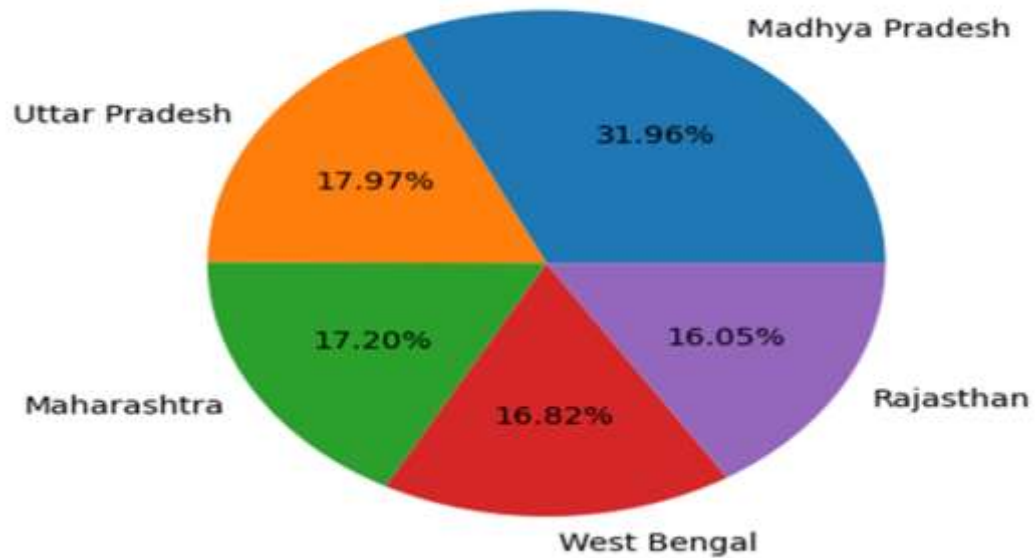


FIGURE 3.2.5. TOP FIVE STATES WITH HIGHEST NUMBER OF RAPE CRIME

Top 5 States With Highest Assault on women with intent to outrage her modesty

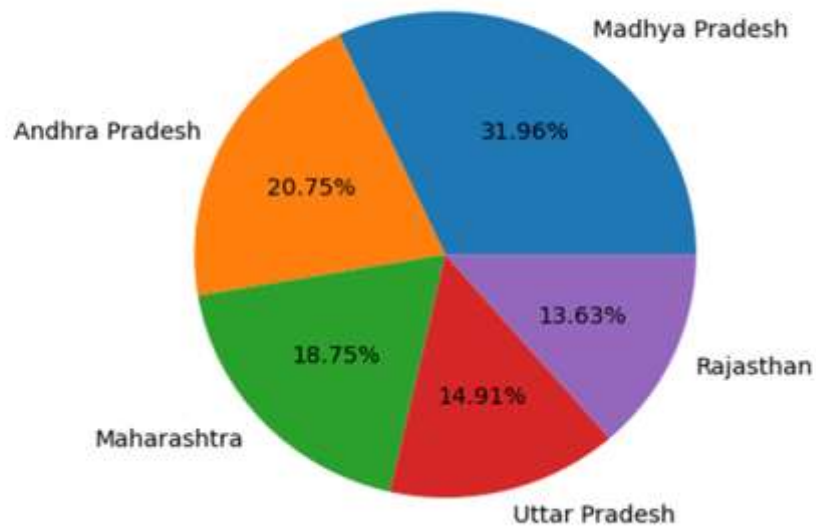


FIGURE 3.2.6. TOP FIVE STATES WITH HIGHEST NUMBER OF ASSAULT ON WOMEN CRIME

Top 5 States With Highest Kidnapping and Abduction

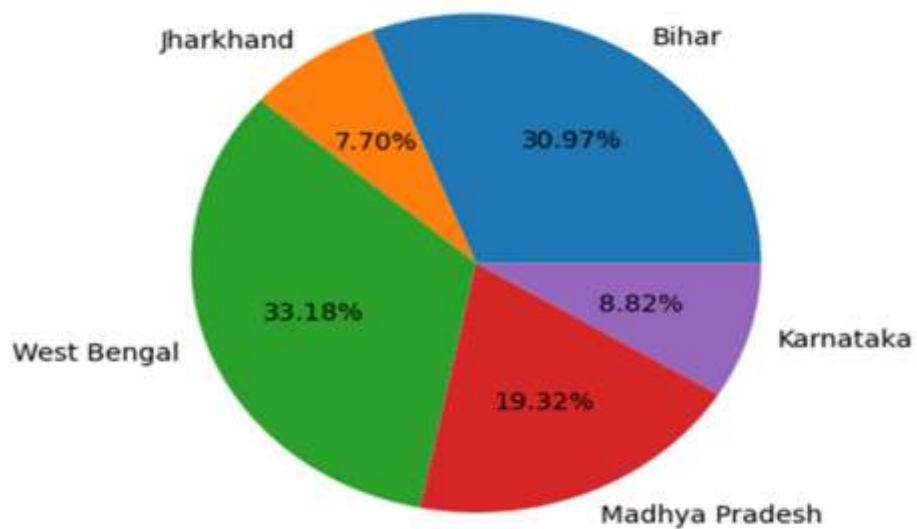


FIGURE 3.2.7 TOP FIVE STATES WITH HIGHEST NUMBER OF KIDNAPPING AND ABDUCTION CRIME

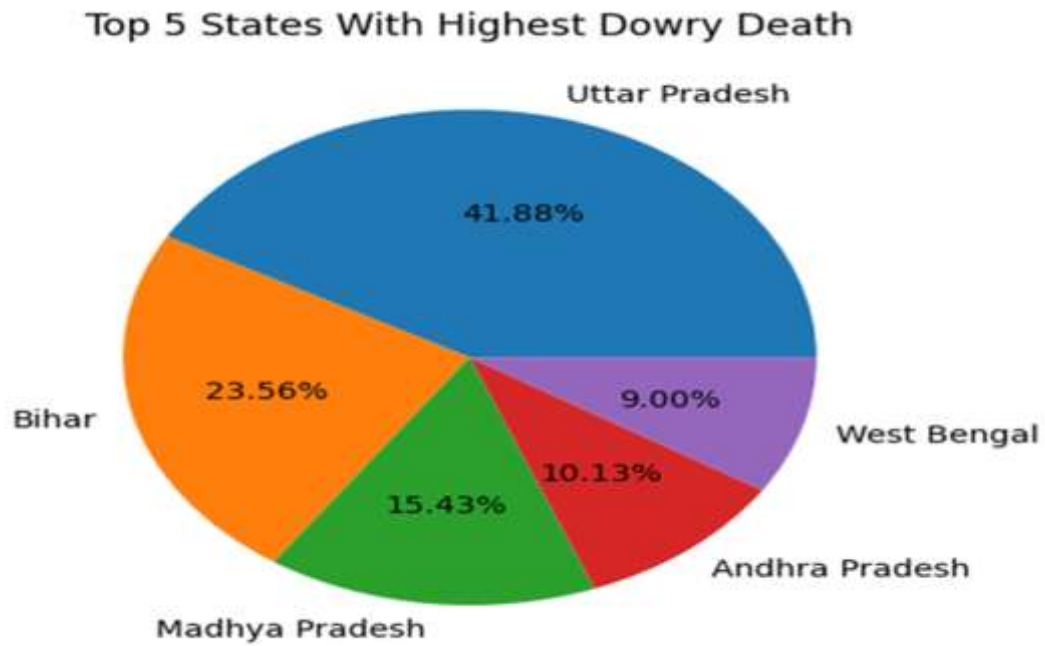


FIGURE 3.2.8. TOP FIVE STATES WITH HIGHEST NUMBER OF DOWRY DEATHS

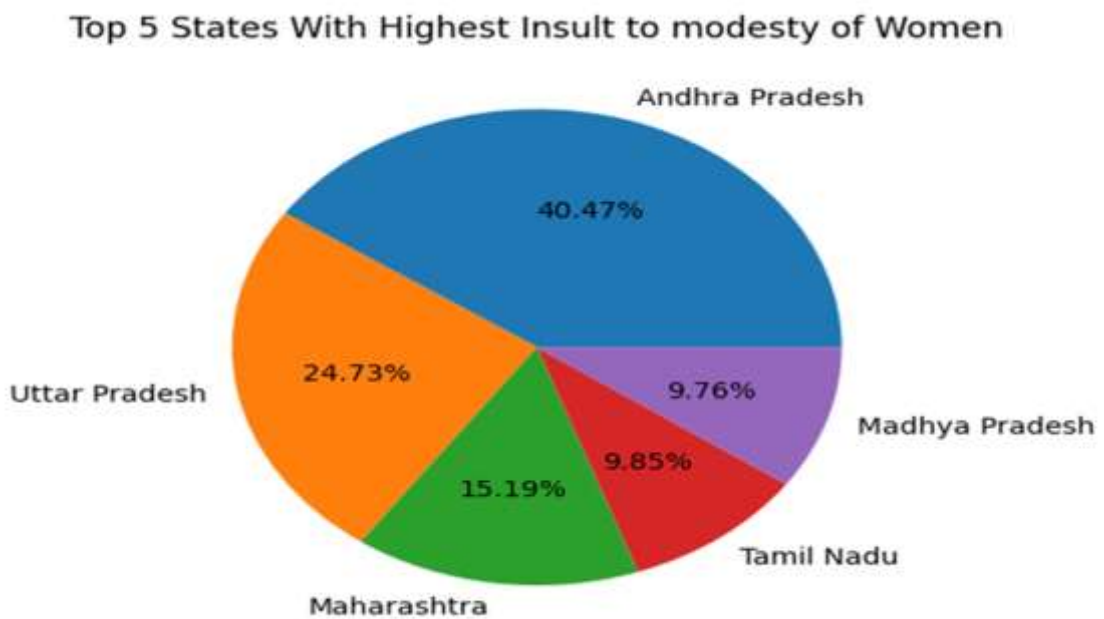


FIGURE 3.2.9. TOP FIVE STATES WITH HIGHEST NUMBER OF INSULT TO MODESTY OF WOMEN

Top 5 States With Highest Cruelty by Husband or his Relatives

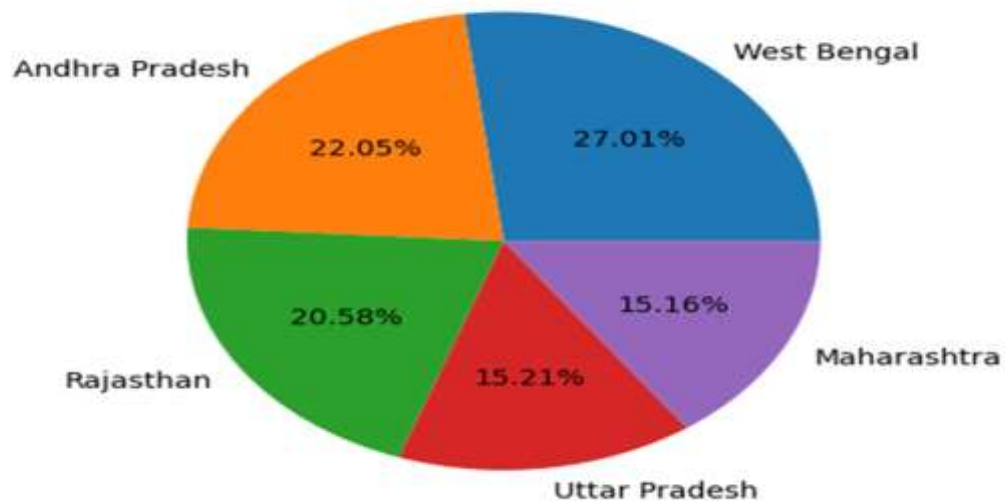


FIGURE 3.2.10. TOP FIVE STATES WITH HIGHEST NUMBER OF CRUELTY BY HUSBAND CRIME

Top 5 States With Highest Importation of Girls

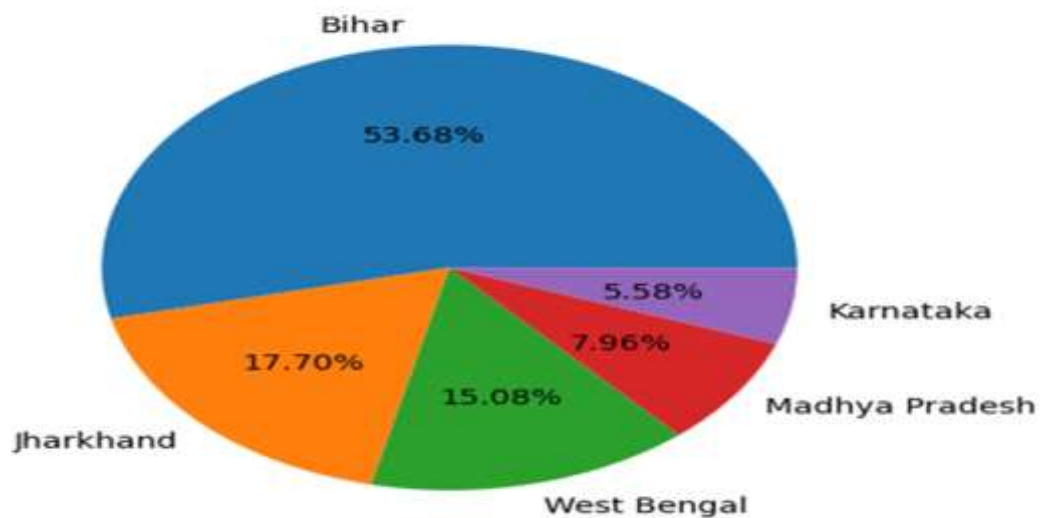


FIGURE 3.2.11. TOP FIVE STATES WITH HIGHEST NUMBER OF IMPORTATION OF GIRLS CRIME

Graph 3.2.5 -3.2.11

- Figure 3.2.5 shows that Madhya Pradesh has highest RAPE rate among other states of 32%.
- Figure 3.2.6 visualized that Madhya Pradesh has maximum number of ASSAULT ON WOMEN of 31.96%

- Figure 3.2.7 HIGHEST NUMBER OF KIDNAPPING AND ABDUCTION is in state Uttar Pradesh at rate of 35.53%.
- HIGHEST NUMBER OF DOWRY DEATHS is in state Uttar Pradesh at rate of 42% from figure 3.2.8
- From figure 3.2.9, HIGHEST NUMBER OF INSULT TO MODESTY OF WOMEN can be seen in state Andhra Pradesh at rate of 40.47%.
- Figure 3.2.10 shows that West Bengal has WITH HIGHEST NUMBER OF CRUELTY BY HUSBAND CRIME of around 27%.
- Figure 3.2.11 shows that Bihar has highest rate of 53.63% of importation of girls.

3.3 ANALYSIS OF TOP THREE STATES IN CRIME

3.3.1 UTTAR PRADESH

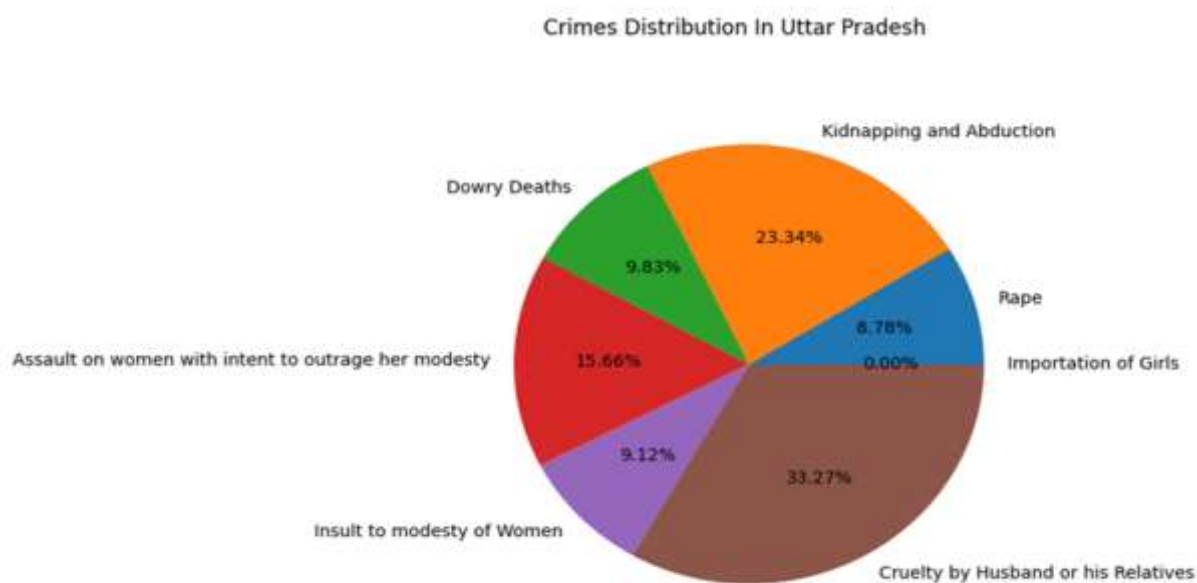


FIGURE 3.3.1. DISTRIBUTION OF CRIME IN UTTAR PRADESH

Most of the crime distribution area is acquired by cruelty by husband (33.27%) followed up by kidnapping and abduction (23.34%) whereas Uttar Pradesh also shows highest rate in kidnapping and abduction among all the states.

	Rape	Kidnapping and Abduction	Dowry Deaths	Assault on women with intent to outrage her modesty	Insult to modesty of Women	Cruelty by Husband or his Relatives	Importation of Girls
2001	3916	5758	4422	5740	5150	14730	0
2014	6934	21252	4938	17210	58	20942	0

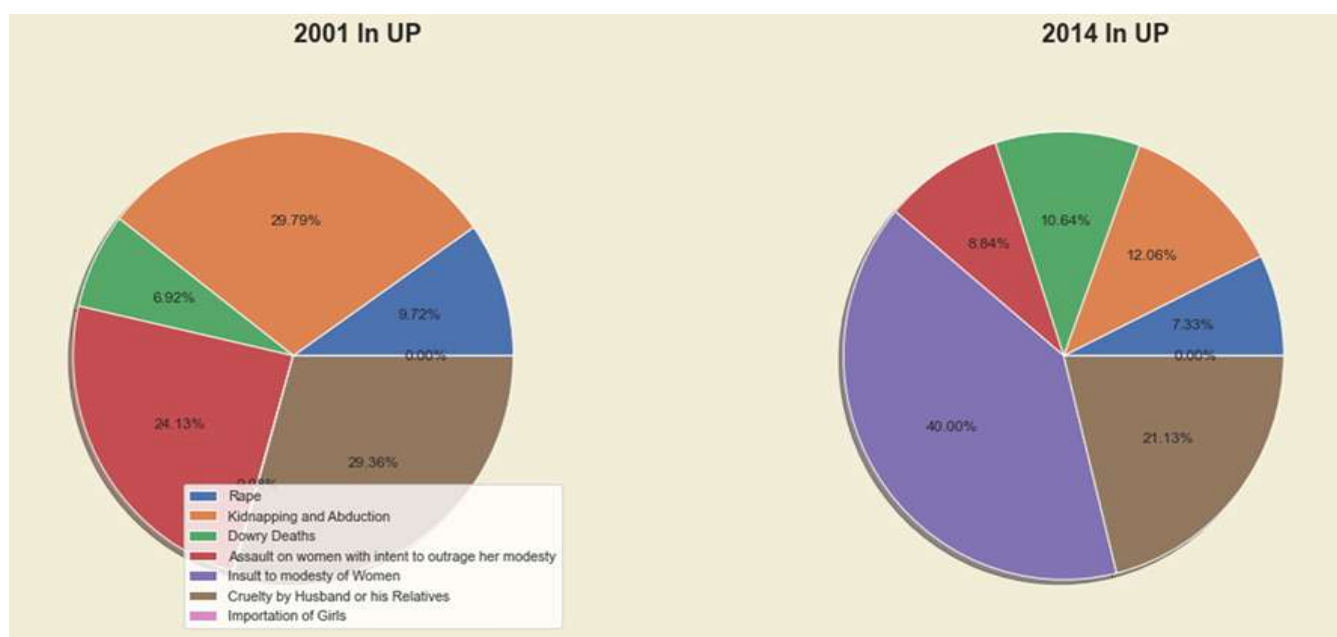


FIGURE 3.3.2 COMPARISION BETWEEN 2001-2014

Rape in UP has shown decrement of 24.5% from 2001 to 2014. Kidnapping and Abduction has shown significant decrease of 59.5% over the year 2001 to 2014. Dowry Deaths in UP has shown increment of 53.7%. Assault on women with intent to outrage her modesty has shown decrement of 63.3%. Insult to modesty of Women has very significant increase from 2001 to 2014. Cruelty by Husband or his Relatives there is decrement from 2001 to 2014

3.3.3. ANDHRA PRADESH

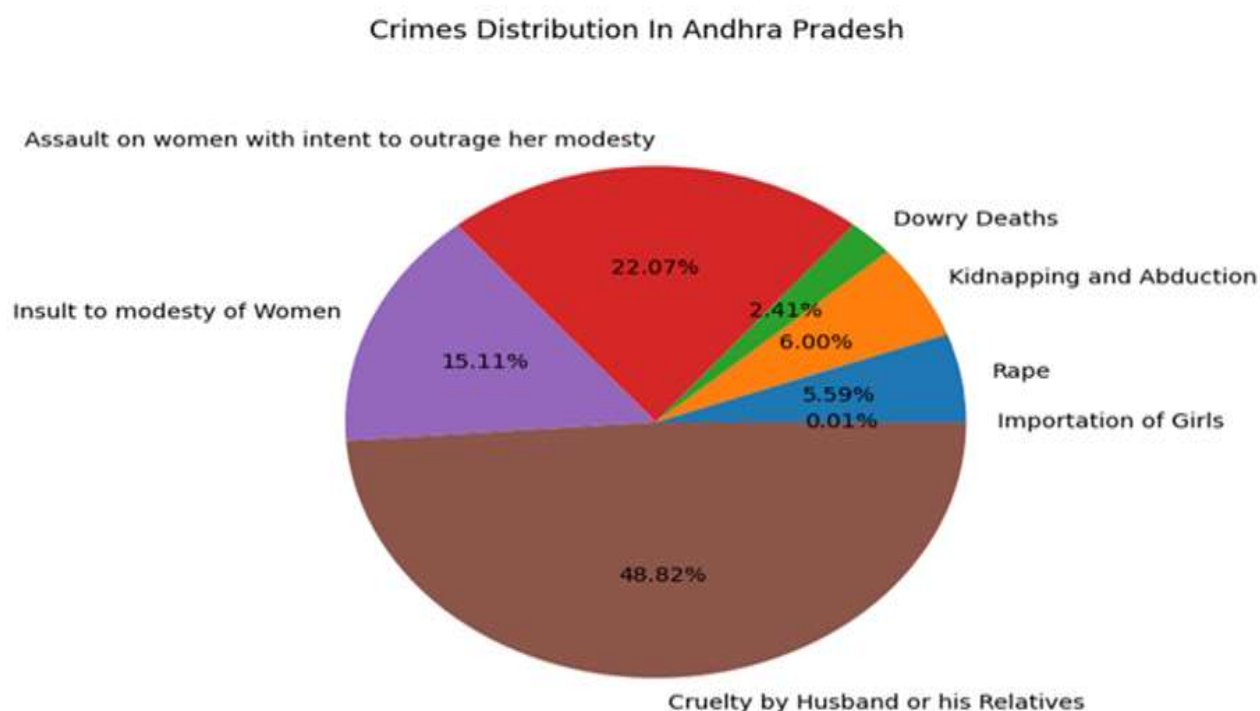


FIGURE 3.3.3. DISTRIBUTION OF CRIME IN ANDHRA PRADESH

Most of the crime distribution area is acquired by cruelty by husband (48.82%) followed up by assault on women (22.07%) as well as Andhra Pradesh also shows highest rate in insult to women modesty among all the states.

	Rape	Kidnapping and Abduction	Dowry Deaths	Assault on women with intent to outrage her modesty	Insult to modesty of Women	Cruelty by Husband or his Relatives	Importation of Girls
2001	1742	1530	840	7088	4542	11582	14
2014	1922	1442	430	9094	5298	12724	0

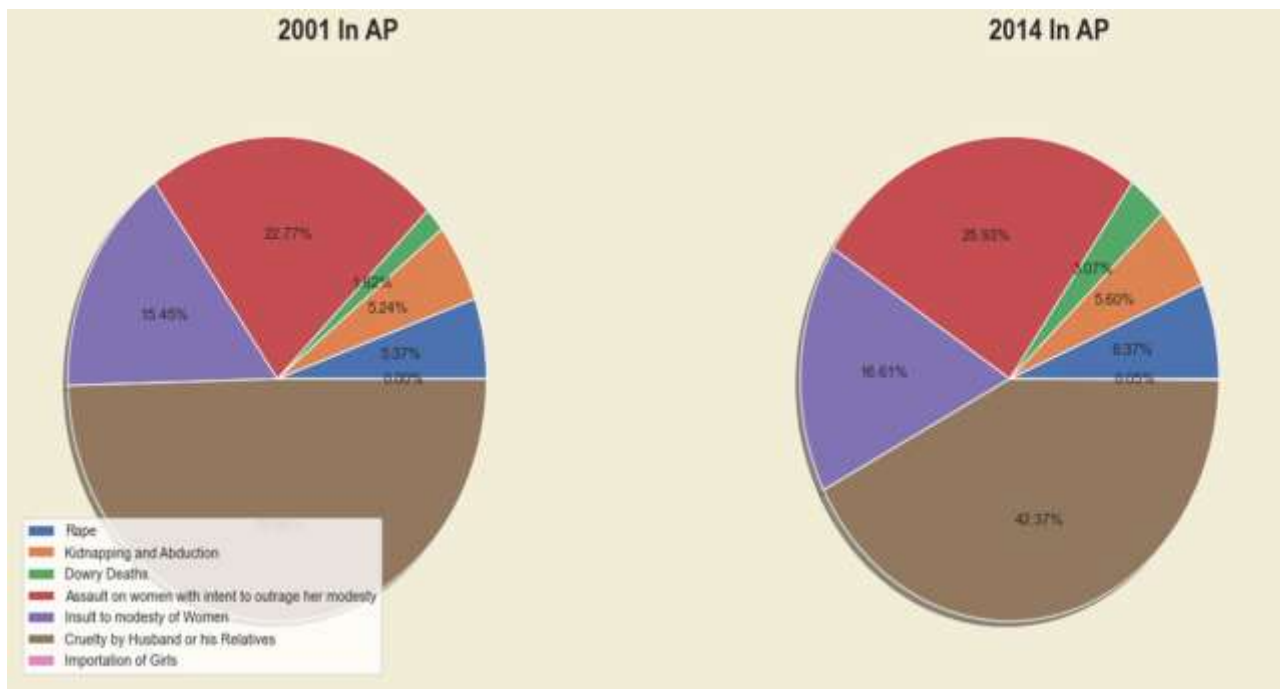


FIGURE 3.3.4 COMPARISION BETWEEN 2001-2014

Rape in AP has shown increment of 7.5% from 2001 to 2014. Kidnapping and Abduction has shown less significant increase over the year 2001 to 2014. Dowry Deaths in AP has shown increment of 68.7%. Assault on women with intent to outrage her modesty has shown increment of 13.8%. Insult to modesty of Women has very significant increase from 2001 to 2014. Cruelty by Husband or his Relatives there is decrement of 14.7% from 2001 to 2014.

3.3.5 WEST BENGAL

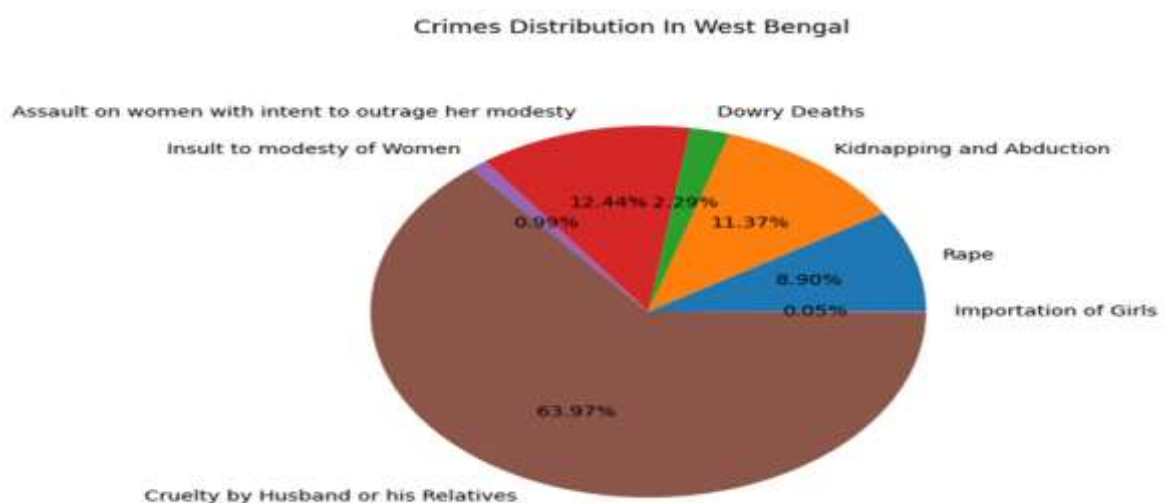


FIGURE 3.3.5. DISTRIBUTION OF CRIME IN WEST BENGAL

Most of the crime distribution area is acquired by cruelty by husband (63.97%) followed up by assault on women (12.44%) as well as West Bengal also shows highest rate cruelty by husband among all the states.

	Rape	Kidnapping and Abduction	Dowry Deaths	Assault on women with intent to outrage her modesty	Insult to modesty of Women	Cruelty by Husband or his Relatives	Importation of Girls
2001	1418	1390	530	1908	96	7718	6
2014	2932	9952	1002	11340	1086	46556	8

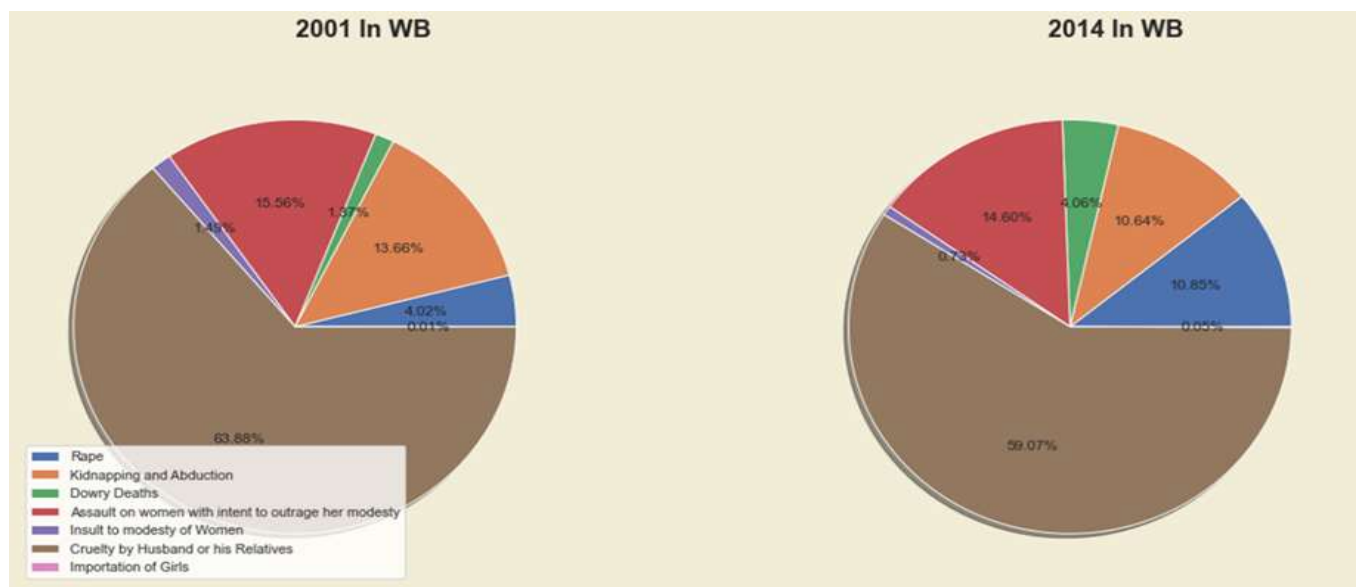


FIGURE 3.3.6. COMPARISION BETWEEN 2001-2014

Rape in WB has shown increment of 62.5% from 2001 to 2014. Kidnapping and Abduction has shown significant decrease over the year 2001 to 2014. Dowry Deaths in WB has shown increment of 65%. Assault on women with intent to outrage her modesty has shown increment. Insult to modesty of Women has very significant decrease from 2001 to 2014. Cruelty by Husband or his Relatives there is decrement of 7.52% from 2001 to 2014.

CHAPTER 4

MODELLING AND TRAINING

```
def setHighCrime(df15):
    if df15['total'] > 7:
        return True
    else:
        return False

df15['highCrime'] = df15.apply(setHighCrime, axis=1)
percentage_instances = df15.groupby('highCrime').size() * 100 / len(df15)
print (percentage_instances)
print ("_____")
print ("Percentage Positive Instance = {} \n Percentage Negative Instance = {}".format(percentage_instances[1], percentage_instances[0]))

highCrime
False      8.167888
True      91.832912
dtype: float64

Percentage Positive Instance = 91.8329118666292
Percentage Negative Instance = 8.167888133378797
```

Setting the criteria of high crime area, here we are only considering where total crimes are greater than seven that area is being consider as high crime area and according to that we split data based on that.

```
dummies = pd.get_dummies(df15.DISTRICT)
dummies
```

	24 PARGANAS NORTH	24 PARGANAS SOUTH	A and N ISLANDS	ADILABAD	AGAR	AGRA	AMMEDABAD COMM.	AMMEDABAD RURAL	AMMEDNAGAR	ANNA- DANG	...	Wokha	YADGIRI	YAMUNANAGAR	YAVATHAL	Yadgiri	Yamunanagar
0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
...
10672	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10673	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10674	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10675	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10676	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

10677 rows x 1805 columns

```
X = df15.drop('Rape', axis=1).drop('Kidnapping and Abduction', axis=1).drop('Dowry Deaths', axis=1).drop('Assault on women with intent to outrage her modesty', axis=1).drop('Insult t
X
```

	total
0	454
1	356
2	456
3	278
4	475
...	...
10672	4
10673	4
10674	10
10675	44
10676	62

10677 rows x 1 columns

```
[ ] Y = df15['highCrime']
Y
```

0	True
1	True
2	True
3	True
4	True
...	...
10672	False
10673	False
10674	True
10675	True
10676	True

Name: highCrime, Length: 10677, dtype: bool

```
[ ] from sklearn.model_selection import train_test_split
x_train, x_test, y_train, y_test = train_test_split(X, Y, test_size=.50, random_state=10)
```

```
[ ] testing = [x_test, y_test]
result = pd.concat(testing, axis=1)

from sklearn.preprocessing import StandardScaler
sc = StandardScaler()
x_train = sc.fit_transform(x_train)
x_test = sc.transform(x_test)
```

```
[ ] from sklearn.linear_model import LogisticRegression
from sklearn.metrics import classification_report, confusion_matrix, accuracy_score, precision_recall_curve, roc_curve, auc, log_loss
import numpy as np
```

```

testing = [x_test, y_test]
result = pd.concat(testing, axis=1)

from sklearn.preprocessing import StandardScaler
sc = StandardScaler()
x_train = sc.fit_transform(x_train)
x_test = sc.transform(x_test)

[ ] from sklearn.linear_model import LogisticRegression
from sklearn.metrics import classification_report, confusion_matrix, accuracy_score, precision_recall_curve, roc_curve, auc, log_loss
import numpy as np

logreg = LogisticRegression()
logreg.fit(x_train, y_train)

y_pred = logreg.predict(x_test)
logreg_accuracy = round(accuracy_score(y_pred, y_test), 3)
print(logreg_accuracy)

0.917

[ ] print(classification_report(y_test, y_pred, labels = logreg.classes_))
print(confusion_matrix(y_pred, y_test))

precision    recall  f1-score   support


```

```

[ ] print(classification_report(y_test, y_pred, labels = logreg.classes_))
print(confusion_matrix(y_pred, y_test))

precision    recall  f1-score   support

False        0.00      0.00      0.00      445
True         0.92      1.00      0.96     4894

accuracy              0.92     5339
macro avg           0.46      0.50      0.48     5339
weighted avg        0.84      0.92      0.88     5339

[[ 0  0]
 [445 4894]]

```

THE WAY FORWARD AND PREVENTION

Crimes against women are, largely, preventable. The best way to prevent crimes against women is to address their root causes. The persistent and increasing burden of poverty on women, unequal access to education, inadequate access to direct participation in the economy and policy making processes, inequality in sharing power and decision making, insufficient mechanism to promote the advancement of women, ineffective implementation of existing rules and regulations to protect women from violence, and inadequacy of ill-equipped, somewhat insensitive, and understaffed police and investigative machinery are some of the important reasons why Indian women are so vulnerable.

Effective responses to crime against women depend on clear understanding of the social norms and the preferences of the involved parties. Altering conventions such as inheritance laws, for example, creates winners and losers, which may lead to domestic conflict and violence. Similarly, various policies that would enable gender equity, such as reserving positions for women, may bring turmoil in society in the short run. Such policies are good for society in the long run. Short-run turbulences should be checked by strengthening the criminal justice system and involving public representatives at local levels to change antiquated social norms. Unfortunately, presently, in the Indian criminal justice system, many crimes are unreported; if reported, often not registered; if registered, true perpetrators not found in many cases; if found, usually not prosecuted; if prosecuted, often not charged; if charged, usually not convicted; if convicted, generally not punished adequately; if punished, too much time is lost in the whole process. In other words, justice is often delayed or practically denied. Therefore, India badly needs to strengthen its criminal justice system to make it effective and efficient. Governments, non-governmental organizations, media, and educational institutions have to play an important role in spreading awareness and changing the mind-set of people. Interventions from these institutions can increase knowledge, challenge attitudes, modify behaviour, and alter social norms and values. Governments should take the initiative to start a number of campaigns targeting men specifically, aiming to challenge traditional concepts of masculinity associated with violence. Messages such as ‘violence towards women is unacceptable’, ‘masculine man is not a violent man’, ‘my strength is not for hurting’, ‘end gender violence’, ‘end violence

against women', 'stop violence against women', etc. should be propagated through print and electronic media to sensitize people to influence their attitude towards gender norms and consequently check their violent behaviour.

Raising public awareness and gender sensitization has been quite successful in curtailing violence towards women in many countries such as South Africa, Nicaragua, Australia, and United States; therefore, central as well as state governments of India should now step up a vigorous campaign for gender sensitization throughout the country.

PREVENTION

- Contact your local legislators and political leaders and advocate for tougher laws against perpetrators of violence against women
- Know that dating violence & sexual assault affects 1 in 3 girls and 1 in 6 boys by the time they are 18
- Contact your local school board and ask them to address sexual harassment in schools
- Understand that putting boys and men down by calling them “ladies” and “girls” hurts everyone
- Speak out against the media’s portrayal of violence. Ask permission before pursuing physical or sexual contact with someone.

CONCLUSION

The results show that the maximum number of deaths in crime against women in almost all the states are

a. Rape

b. Assault by husband or family members or Dowry cases

- Women have faced a main issue, which is that most of the cases are not even registered in any police station or in any legal office.
- Uttar Pradesh has the highest number of Reported cases as compared to other states.
- Madhya Pradesh has highest rape rate among other states

The analysis shows that crimes against women in India have been increasing at an alarming rate of close to 6% per year since 2001. We have found that there is a huge variation in the crime rate across states and union territories. Crimes against women are, largely, preventable. The best way to check crime against women is to prevent it from happening in the first place by addressing its root and structural causes. In general, crime against women is rooted in gender-based discrimination and social norms and gender stereotypes that perpetuate such crime. That is why prevention should start early in life, by educating young boys and girls to have respectful relationships and gender equality. Disproportionate burden of poverty on women, unequal access to education, inadequate access to direct participation in the economy and policy making processes, inequality in sharing power and decision making, and ineffective implementation of existing rules and regulations to protect women from violence are some of the important reasons why women in India are so vulnerable. Therefore, public policies and interventions should focus on promotion of gender equality, women's empowerment and their enjoyment of human rights. It also means making the home and public spaces safer for women, ensuring their economic autonomy and security, and increasing their participation and decision making powers in the home, as well as in the offices and public life. In general, if we have more men in the society who are unable to marry, even though they would be willing to marry, society will face greater level of violence and crimes particularly against women. In other words, violent crime against women increases as the deficit of women increases in society. According to 2011 census data, India has 37 million more men than women and about 17

million excess men in the age group that commits most crimes. Therefore, central as well as state governments in India need to take appropriate steps including enforcing existing laws against dowry and sex-selective abortion to avoid more serious consequences of gender imbalance. Governments, non-governmental organizations, media, and educational institutions have to play an important role in this regard. Interventions from these institutions can increase knowledge, challenge attitudes, modify behaviour, and alter social norms and values. Current efforts in this regard in India are not sufficient in comparison to what should be done. Along with non-governmental organizations, media, and educational institutions, central as well as state governments of India should now step up a vigorous campaign for gender sensitization throughout the country.

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