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CRIME AGAINST WOMEN IN INDIA

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***Abstract*— The main objective of this paper is to analyze the crime which entails various violations against women both quantitatively and qualitatively. Crime Against Women is a public health Problem. A deep analysis is made on Crime against women which will be helpful in understanding the depth of the problem and to take further steps to stop crime against women in India. Crime against women in India is Increasing rapidly and it is essential to get rid of this problem. The main aim is to analyze and find insights using data manipulation and visualization techniques by applying various tools of analytics and giving a clear idea about the data and forecasting or predicting the future crime rate by using the past data. Descriptive analysis using various charts & graphs will be undertaken to perform data visualization which helps to draw valid conclusions.**

Keywords— **Descriptive and exploratory analysis, data visualization, predictive analysis, trend, forecasts.**

I. INTRODUCTION

Crime or Violence Against Women is also refers to Physical Violence committed against women. According to NCRB (National Crime Records Bureau) in India, the crime rate has increased 6.4% during 2012 and crime is committed every three minutes. While in 2015 the crime rate has increased 44% with 3,00,000 reported incidents.

There are several crimes committed against women such as Rape, Dowry Deaths, Kidnapping and Abduction, Cruelty by Husbands or Relatives, Domestic Violence, Acid Throwing, Forced and Child Marriage etc.

In this paper, an attempt is made to analyze and find insights about the crime committed against women by considering the attributes related to Victims of Rape such as State, Year, Rape cases Reported, Victims up to 10 years, Victims between 10 to 14 years, Victims between 14 to 18 years, Victims between 18 to 30 years, Victims between 30 to 50 years, Victims above 50 years, Total Victims for rape case etc.…

This paper has the following sections

- Data Collection
- Data Cleaning
- Performing Exploratory Data Analysis
- Predicting the future Victims for Rape cases.
- Drawing a valid conclusion

II. METHODOLOGY

A deep Exploratory data Analysis is made on Crime against women in India and predicting the future crime rates by using the past data from the year 2001 - 2010. Three types of analysis are undertaken,

1. Univariate Analysis
2. Bivariate Analysis
3. Multivariate Analysis

Regression, Trend and Forecast is used for Prediction of future crime rates.

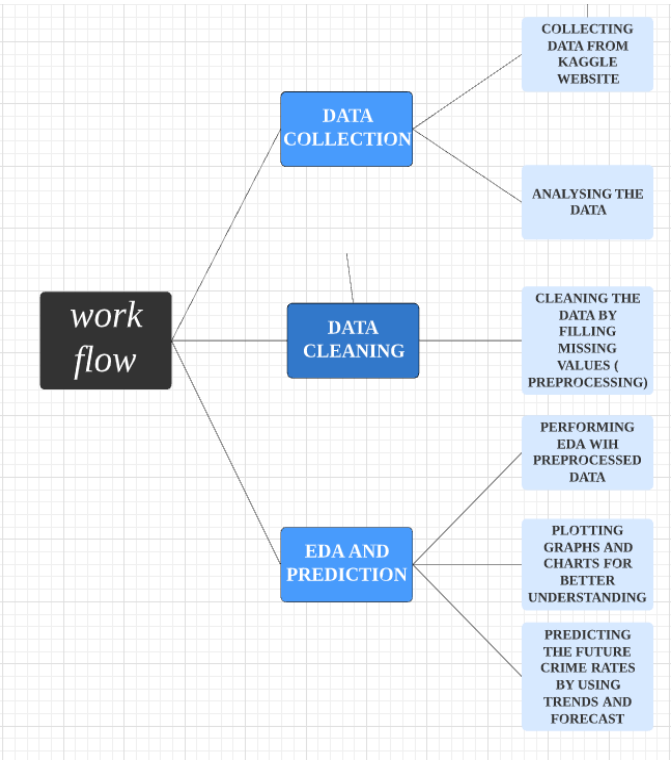

Fig. 1. Flow of Process for Data Analysis

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A. DATA COLLECTION:

The dataset is publicly available on the Kaggle website and it includes 1049 records and 11 attributes. The attributes are State, District, Year, Rape cases Reported, Victims up to 10 years, Victims between 10 to 14 years, Victims between 14 to 30 years, Victims between 30 to 50 years, Victims above 50 years, Total Victims for rape case.

	Area_Name	Year	Subgroup	Rape_Cases_Reported	Victims_Above_50_Yrs	Victims_Between_10-14_Yrs	Victims_Between_14-18_Yrs	Victims_Between_18-30_Yrs
0	Andaman & Nicobar Islands	2001	Total Rape Victims	3	0	0	3	0
1	Andaman & Nicobar Islands	2001	Victims of Incest Rape	1	0	0	1	0
2	Andaman & Nicobar Islands	2001	Victims of Other Rape	2	0	0	2	0
3	Andaman & Nicobar Islands	2002	Total Rape Victims	2	0	0	1	1
4	Andaman & Nicobar Islands	2002	Victims of Incest Rape	0	0	0	0	0
...	...	...	...	...	...	...	...	...
1045	West Bengal	2009	Victims of Incest Rape	3	0	0	1	1
1046	West Bengal	2009	Victims of Other Rape	2333	0	18	84	1834
1047	West Bengal	2010	Total Rape Victims	2311	0	22	51	1779
1048	West Bengal	2010	Victims of Incest Rape	4	0	1	0	2
1049	West Bengal	2010	Victims of Other Rape	2307	0	21	51	1777

1050 rows × 11 columns

Fig. 2. Dataset for Victims of Rape in India

B. DATA CLEANING:

All the real-world data are not so perfect; hence there is an existence of missing values generated during the data entry process. Therefore, missing values are filled, data are filtered as required and impropriate data are removed. This preprocessing of data helps in rendering highly accurate values and the power of prediction is increased.

C. EXPLORATORY DATA ANALYSIS:

Exploratory data analysis is used for the past data and it is represented in the form of graphs and charts. Graphs and charts are very well helpful in data visualization and for easy understanding. EDA is mainly used to summarize the main characteristics in the datasets, often using statistical graphs and charts and other data visualization methods.

1.1 Histogram:

Histogram is a Graphical representation of data by using bars with different heights. Histogram displays the spread of data and each bar represents the range and the taller bar denotes that the more data falls in that particular range. Fig. 3. Represents the frequency distribution of each and every attribute in the dataset.

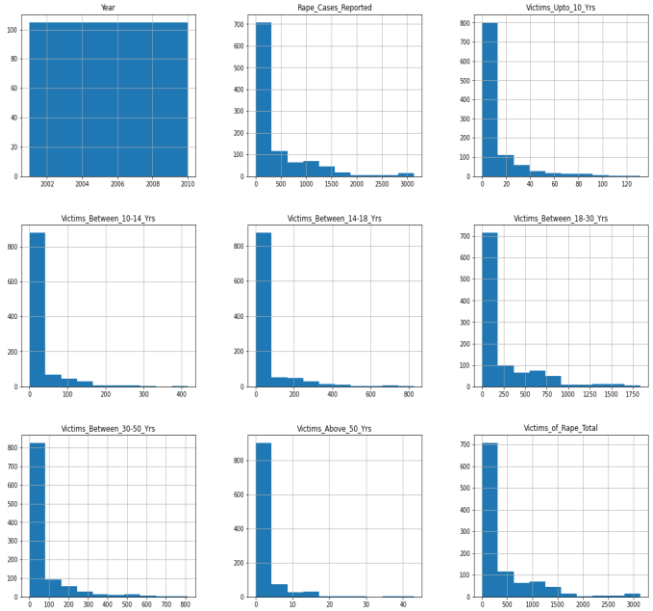

Fig. 3. Histogram plot for attributes in dataset

1.2 PIE CHART:

Fig. 4. Represents the pie chart for Over all Rape Crimes in India. Inference about the pie chart shown below,

- Victims up to 10 years: 2.9%
- Victims between 10 to 14 years: 6.5%
- Victims between 14 to 18 years: 14.7%
- Victims between 18 to 30 years: 58.8%
- Victims between 30 to 50 years: 16.6%
- Victims above 50 years: 0.5%

The Maximum Rape Cases Reported for the age group between 18 to 30 years with 58.8% and Minimum Rape Cases Reported for the age group above 50 years with 0.5%.

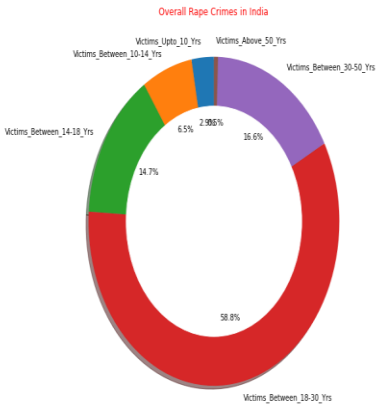

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Fig. 4. Pie chart for Over all Rape crimes in India

1.3 BAR CHART:

Fig. 5 Represents the Bar chart for Total Rape Crimes Reported in each year from 2001 – 2010. The 'X' axis denotes year and 'Y' axis denotes Total rape cases Reported. Through Bar Chart it is clearly visible that the reported rape crimes increase linearly from 2001 – 2010 which shows that the rape crimes are Increasing rapidly over years and it is important to protect women and to stop crime against women.

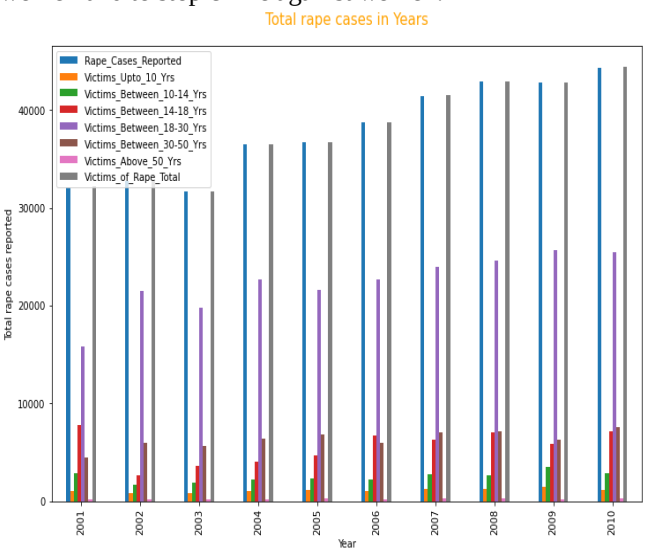

Fig. 5. Bar chart Representation for Total Rape cases in years

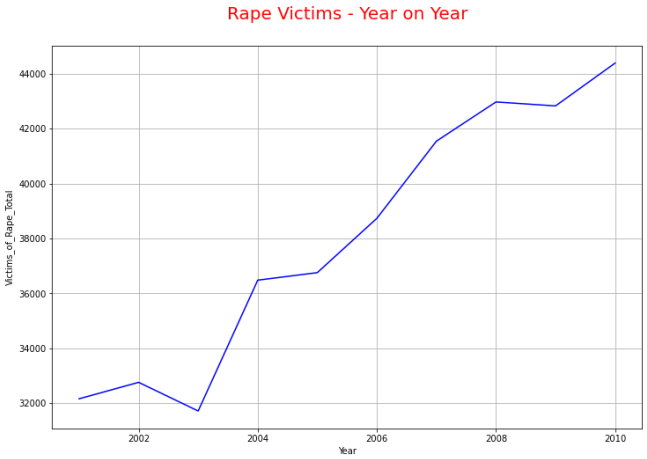

Fig. 6. Increase in Rape Victims over years through line plot

Fig 6 Represents the Line Chart which clearly depicts the linear increase of Rape Victims from the year 2001 – 2010 but there is slight decrease in 2003. It goes on Increasing and Firm step is taken towards this goal, so that the domestic violence could be reduced if not stopped completely. Not only the Rape Crimes, all the crimes which is against women are continuously increasing day by day in India.

1.4 RAPE CASES STATE WISE:

Fig. 7 represents the graphical pie chart for state wise reports with percentage. The inference about the pie chart is shown, Madhya Pradesh: 15.4%, West Bengal: 8.61%, Uttar Pradesh: 7.92%, Maharashtra: 7.63%, Assam: 6.71%, Rajasthan 6.29%, Bihar: 5.92%, Andhra Pradesh: 5.62%, Chhattisgarh: 5.13%, Odisha: 4.66%, Jharkhand: 3.98%, Tamil Nadu: 2.92% etc.…
Madhya Pradesh ranks high with 15.4% percentage and Lakshadweep, Daman and Diu, Sikkim ranks low in crime reports with 0.003% because the population is very low in these three states.

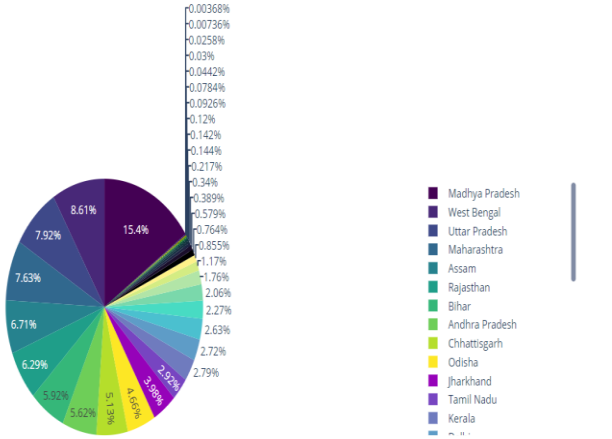

Fig. 7. State wise rape cases reported

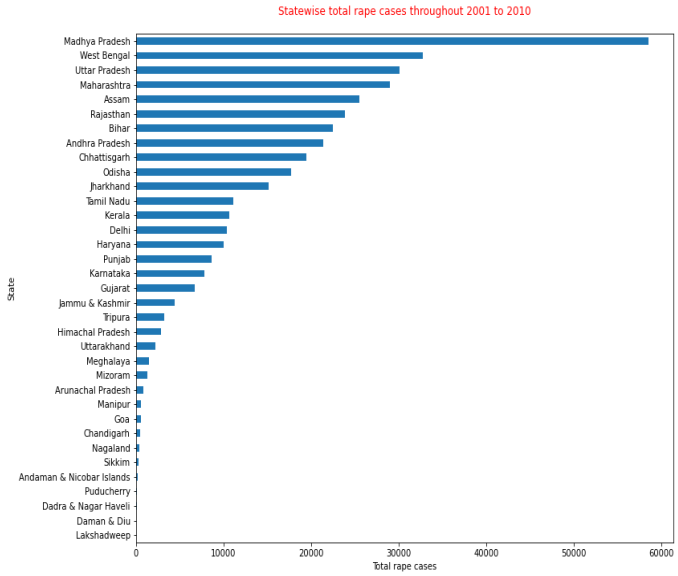

Fig. 8. State wise rape cases reported using bar chart

1.5 SAFE AND UNSAFE STATE FOR WOMEN:

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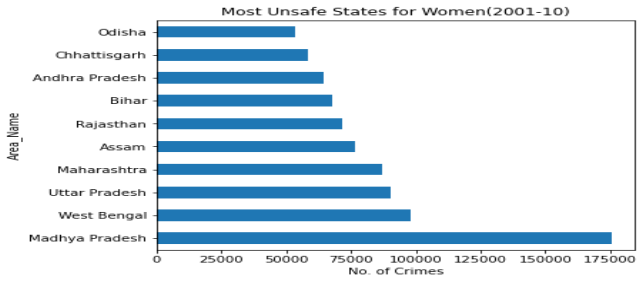

Fig. 9. Most Unsafe State for Women in India

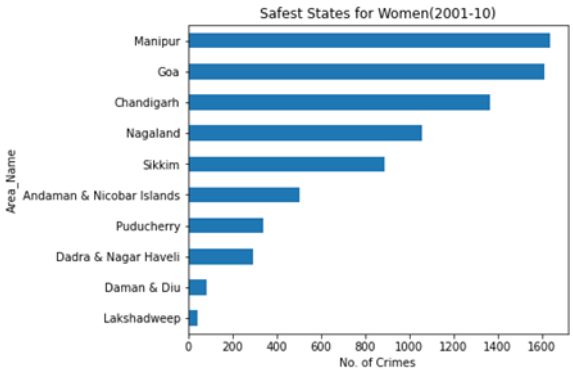

Fig. 10. Safest State for Women in India

Fig 9 and Fig 10 represents the safe and unsafe states for women in India based on the population, Level of crime rates from 2001-2010.

The Safest State for Women,

States	**Total Reported Crimes from 2001 to 2010**
Manipur	542
Goa	532
Chandigarh	456
Nagaland	352
Sikkim	298
Puducherry	114

The Unsafest State for Women,

States	**Total Reported Crimes from 2001 to 2010**
Madhya Pradesh	58512
West Bengal	32756
Uttar Pradesh	30106
Maharashtra	28896
Assam	25524

1.7. UNREPORTED RAPE CASES FROM 2001 – 2010:

Fig 11 represents the Unreported Rape Crimes in India. Unreported crime cases are reaching high when compared to the reported crimes. According to NFHS, 99 % of the violence faced by women go Unreported. Unreported cases are continuously increasing due to lack of support, isolation, Betrayal, fear, Shame etc.… Maximum number of unreported cases recorded in 2007. While combining these reported and unreported cases, the crime rates are reaching extremely high and it is very dangerous for women living in India. The state with low population has very less number of crime rates and state with high population has more number crime rates. Both reported and unreported cases go on increasing, so it is important to take further steps and to bring effective laws to protect women in India.

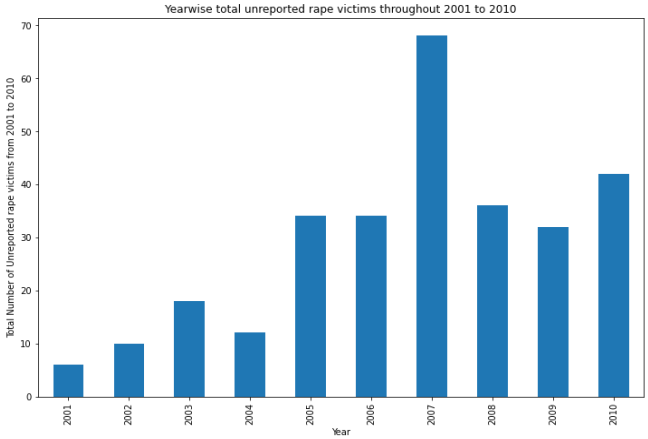

Fig. 11. Un Reported Rape cases from 2001 – 2010

III. RESULTS AND DISCUSSIONS

The Real Time Dataset contains year from 2001-2010. An Exploratory data Analysis is made on Past Data and with some data Visualization tools like Graphs, Charts are used for better Understanding. Now for Predicting the Crime Rates in India the best tool in Excel called 'FORECAST' and by using the 'Trend Line' and 'Regression', the prediction is made up to 2025 and Fig. 12 Represents the Predicted Graph for sum of Rape cases Reported in India till 2025.

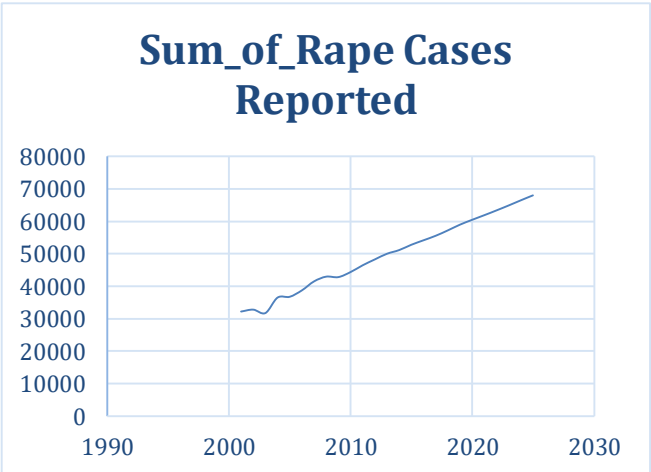

Fig. 12. Predicted Rape Cases till 2025

It is clear from the graph that the Sum of Rape cases reported increases linearly from 2001 to 2025.

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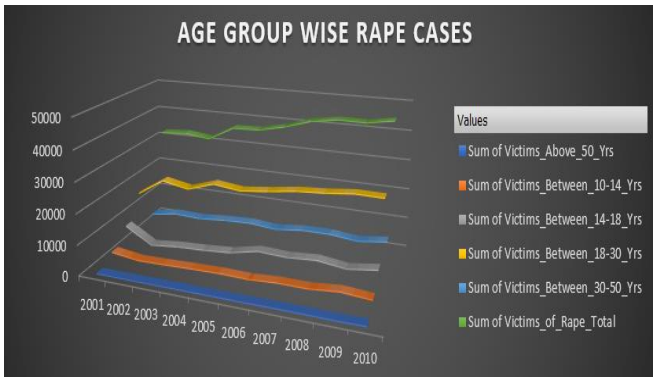

Fig. 13. Age Group Wise Rape Cases from 2001-2010

Fig 13 represents Age Group wise Rape cases Reported from 2001 – 2010. The Line graph shows that Age group above 50 has very low impact when comparing with other Age groups and Age Group between 18 – 30 years reported maximum number of Rape cases when comparing with others. Hence Rape cases and crime against women get increased in Future and Crime Reports also linearly increasing over years.

IV. CONCLUSION

It is Observed from the result that the Rape Cases Increasing Rapidly over years and this linear increase in crime reports is very dangerous to women in India. From the above graphs and charts,

- Age Group between 18 – 30 years has great impact with 58.8% of reported cases.
- Reported rape crimes increases linearly from 2001 – 2010
- Madhya Pradesh Ranks first in Rape Crimes with 15.4% and Second Highest is West Bengal with 8.61%.
- State with low population has very low crime reports (Lakshadweep, Daman and Diu, Sikkim) with 0.003%.
- Top 5 Unsafest States for women in India are Madhya Pradesh, West Bengal, Uttar Pradesh, Maharashtra and Assam.
- Top 5 Safest States in India are Puducherry, Sikkim, Chhattisgarh, Nagaland and Goa.
- Top 5 states under Rape Cases are Madhya Pradesh, West Bengal, Uttar Pradesh, Maharashtra and Assam.
- Even Unreported cases also increasing linearly over years.
- Prediction is made for Sum of Rape Cases Reported from 2001 – 2025 and the result denotes that reported rape cases increases Linearly and there will be a great impact in future.

Increase in crime rates from 2003(7.5%) to 2007(8.8%) at National Level. While comparing each and every states and district it is from 21,861(2006) to 24,708(2007) with 13.01% in Just one year. These features show a hazardous situation in India with respect to safety and security of women.

The following measures suggested for reducing crime against women

- Creating awareness about rights among women through media.
- Published literature
- voluntary agencies.
- Effective functioning of family courts and family counseling etc.

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