Crime Against Women – 2015-16

Report

FEBERUARY 21

IIFT, Delhi
Authored by: Sumiran Naman
Roll No: 40A – MBA(BA)
Submitted to: Dr. Amarnath Mitra

Report on Crime against Women in the years 2014-16: Focus on Rape, Assault and Murder and Statistical findings.

Introduction

The report is based on Crime Against Women Dashboard – a comprehensive tool designed to illuminate and analyze incidents of violence against women in India from 2014 to 2016. This report serves as a vital resource for understanding the alarming trends and patterns related to crimes such as rape, murder, and assault. By presenting data-driven insights, we aim to foster awareness and empower individuals, policymakers, and communities to collaboratively address the pressing issue of violence against women. Explore the visualizations and statistics within this dashboard to gain a deeper understanding of the challenges faced, facilitating informed discussions and actions towards a safer and more secure environment for women in India.

Summary of Dashboard:

- First tab: *Data Explanation tab covers the summary of data*.
- Second Tab: *Visualization tab covers interactive graphs.*
- Third Tab**:** *Analysis tab covers ANOVA teststo check if cases have risen over the years.*

> *"There has been no significant variation in the Total Cases Registered, Rape Cases, Assault Cases and Murder Cases over 2014-16."*

Detailed Analysis

Tab 1: Data

Part 1: Introduction
The tab puts forward the information that is intended to present to the user. The Crime Against Women Dashboard – a comprehensive tool designed to illuminate and analyze incidents of violence against women in India from 2014 to 2016. This dashboard serves as a vital resource for understanding the alarming trends and patterns related to crimes such as rape, murder, and assault. By presenting data-driven insights, we aim to foster awareness and empower individuals, policymakers, and communities to collaboratively address the pressing issue of violence against women.

Part 2: Table
This section provides the data that has been in developing the dashboard. Data is sourced from Kaggle which has been sourced and compiled from data.gov.in, which is open-source website by government of India.

Part 3: Structure
This part of the dashboard presents a detailed overview of different types of crimes. Variables are State/UT (Names of states) and number of cases registered under different crime categories(Rape, Assault and Murder) over 2014, 2015and 2016.

Part 4: Summary
Objective: To identify different statistical parameters for cases registered under different crime categories over years 2014, 2015 and 2016.
Analysis: Here summary function of R is used on all variables of data frame.

```
Result: State/UT          Rape - 2015       Rape - 2016      Assaults (molestation) - 2015
Assaults (molestation) - 2016

 Length:35          Min.  :   0.0   Min.  :   5.0   Min.   :    5                Min.
:    1.0

 Class :character   1st Qu.:  64.5   1st Qu.:  64.5   1st Qu.:   80                1st Qu
.:   69.5

 Mode  :character   Median :  421.0   Median :  336.0   Median :   844                Median
:   667.0

                    Mean   :  955.8   Mean   :1081.1   Mean    :  2210                Mean
:  2302.0
```

```
                     3rd Qu.:1180.5   3rd Qu.:1640.5   3rd Qu.: 4140                3rd Qu
.: 3898.0

                     Max.   :4391.0   Max.   :4882.0   Max.   :11713               Max.
:11396.0

 Murder (women) - 2015 Murder (women) - 2016 2014 - Cases registered 2014 - Total rape Cas
es 2015 - Cases registered

 Min.   :   0.0        Min.   :   0.0        Min.   :    4          Min.   :    1
Min.   :    9.0

 1st Qu.:  11.0        1st Qu.:  11.0        1st Qu.:  344          1st Qu.:   79
1st Qu.:  301.5

 Median :  97.0        Median :  99.0        Median : 5481          Median :  455
Median : 5340.0

 Mean   : 215.8        Mean   : 212.7        Mean   : 8601          Mean   : 1008
Mean   : 8455.0

 3rd Qu.: 339.0        3rd Qu.: 314.5        3rd Qu.:14399          3rd Qu.:1336
3rd Qu.:14664.5

 Max.   :1135.0        Max.   :1217.0        Max.   :38918          Max.   :5076
Max.   :35908.0

 2016 - Cases registered

 Min.   :    9

 1st Qu.:  310

 Median : 4463

 Mean   : 8755

 3rd Qu.:14720

 Max.   :49262
```

Implication: It shows cases per state for Rape, Assault and Murder. However, cases per state for crimes across categories have remained statistically stable.
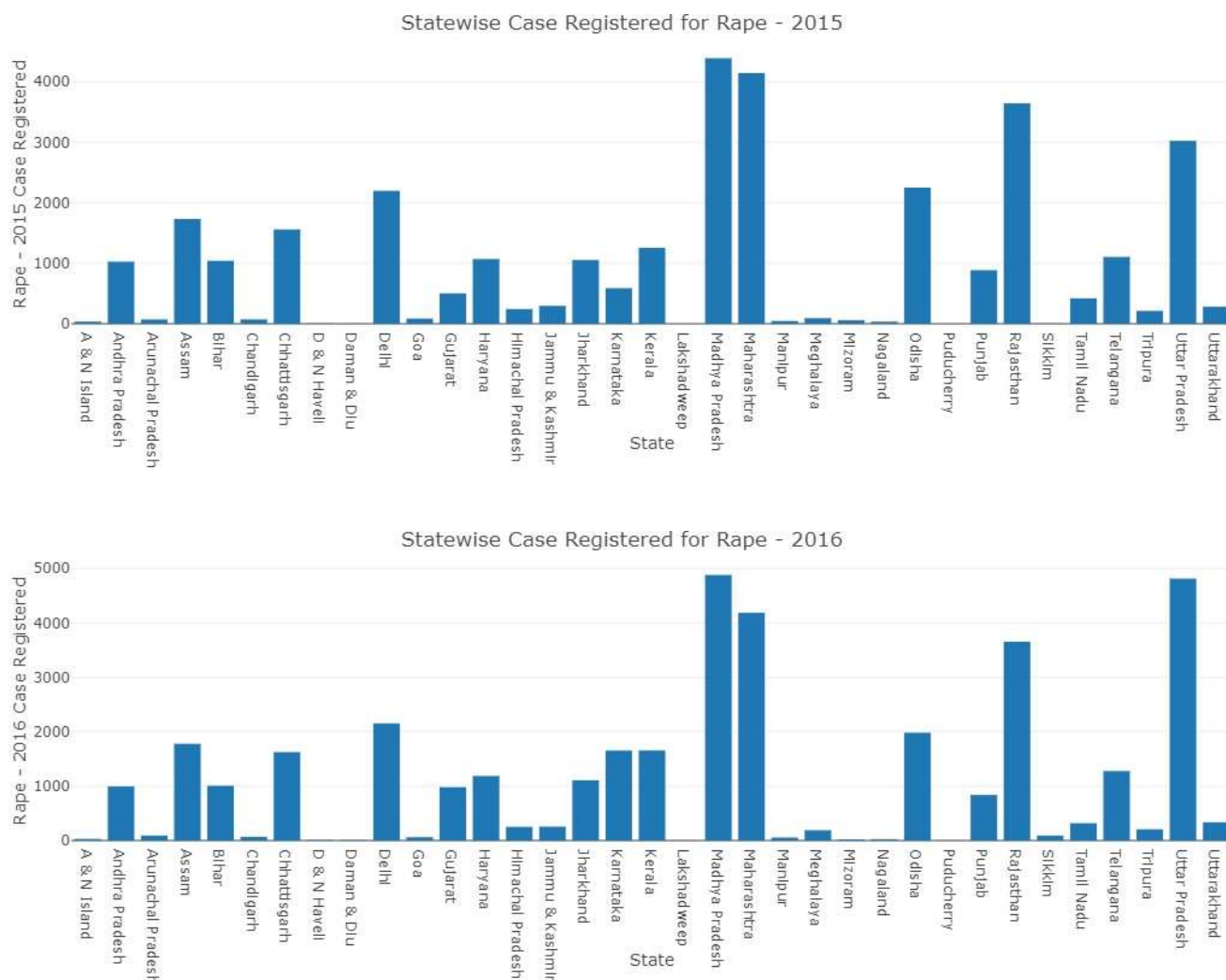
Tab 2: Visualization

Part 1: Crime against Women Trends by States

Objective: To show state wise crime relating to women.

Analysis: In this part of dashboard, we have used an interactive histogram which has states on X-axis and different cases in different years on y-axis.

Result:

Statewise Case Registered for Rape - 2015

Statewise Case Registered for Rape - 2016

Implication: This section portrays that similar states have emerged as states with the greatest number of cases registered in different years which shows that crimes against women are prominent in some states and state-government should undertake focused measures for these states.

Part 2: Distribution

Objective: To show trend among number of crimes per state.

Analysis: In this section of dashboard, we have used an interactive histogram and box plot which has the name of crime on X axis and number of cases in different states on y axis.

Result:

Rape - 2015

Rape - 2016
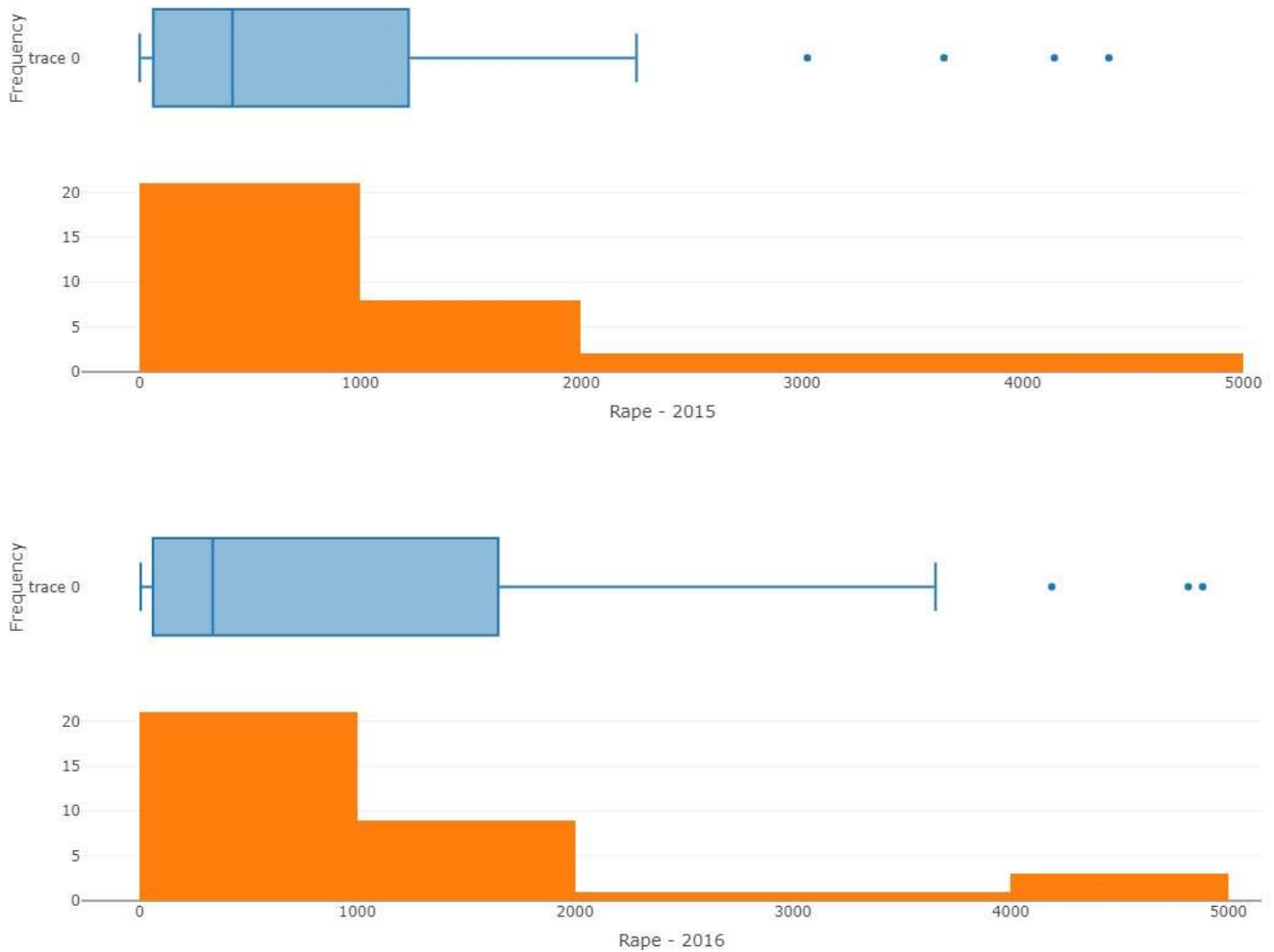
Implication: This section portrays that most states have Rape cases under 1000, which implies some states have registered more cases which is inherently increasing national average cases per state.

Tab 3: Analysis

Part 1: Introduction

This part of Dashboard statistically compares different crimes against women per state over years using test of ANOVA.

Part 2: Test for Total Cases Registered Cases

Objective: To check the impact of different states and years on Total cases registered.

Analysis: We've employed Analysis of Variance (ANOVA) with the formula **Cases Registered ~ Year + Error (State / Year)**. This approach is well-suited for investigating the impact of the variable 'Year' on the response variable 'Cases,' while accounting for potential variations across States and within each State over different Years.

H0: The null hypothesis posits no significant relationship between the variables,

H1: Alternative hypothesis suggests a significant association between them.

Result:

```
        Error: State
           Df    Sum Sq    Mean Sq F value Pr(>F)
Residuals 34 1.15e+10 338169634


Error: State:Year
           Df     Sum Sq Mean Sq F value Pr(>F)
Year        2    1580232  790116   0.336  0.716
Residuals 68 160093598 2354318
```

- **Error: State: Year**

  F value: 0.336 , Pr(>F): 0.716

  This suggests the interaction effect between 'State' and 'Year.' The p-value (0.716) indicates that there is no evidence to reject the null hypothesis, suggesting that the effect of 'Year' on 'Cases Registered' doesn't vary significantly across different 'States'.

  Policy Implication: In conclusion, there isn't a significant overall effect of 'Year' on 'Cases registered' across all 'States'.

Part 3: Test for Rape Cases Registered

Objective: To check the impact of different states and years on Rape cases.

Analysis: We've employed Analysis of Variance (ANOVA) with the formula **Rape Cases ~ Year + Error (State / Year)**. This approach is well-suited for investigating the impact of the variable 'Year' on the response variable 'Cases,' while accounting for potential variations across States and within each State over different Years.

H0: The null hypothesis posits no significant relationship between the variables,

H1: Alternative hypothesis suggests a significant association between them.

Result:

```
Error: State

        Df    Sum Sq Mean Sq F value Pr(>F)

Residuals 34 167453268 4925096

Error: State:Year

        Df  Sum Sq Mean Sq F value Pr(>F)

Year      2  277375  138687   3.047  0.054 .

Residuals 68 3095223   45518
```

- **Error: State: Year**

F value: 3.047 , Pr(>F): 0.054

This suggests the interaction effect between 'State' and 'Year.' The p-value (0.054) indicates that there is no evidence to reject the null hypothesis, suggesting that the effect of 'Year' on 'Rape Cases' doesn't vary significantly across different 'States'.

Policy Implication: In conclusion, there isn't a significant overall effect of 'Year' on 'Rape cases' across all 'States'.

Part 4: Test for Assault Cases Registered

Objective: To check the impact of different states and years on Assault cases.

Analysis: We've employed Analysis of Variance (ANOVA) with the formula **Assault Cases ~ Year + Error (State / Year)**. This approach is well-suited for investigating the impact of the variable 'Year' on the response variable 'Cases,' while accounting for potential variations across States and within each State over different Years.

H0: The null hypothesis posits no significant relationship between the variables,

H1: Alternative hypothesis suggests a significant association between them.

Result:

```
Error: State
        Df     Sum Sq  Mean Sq F value Pr(>F)
Residuals 34 650218885 19124085


Error: State:Year
        Df  Sum Sq Mean Sq F value Pr(>F)
Year      1  147752  147752   0.564  0.458
Residuals 34 8901783  261817
```

- **Error: State: Year**

F value: 0.564, Pr(>F): 0.458

This suggests the interaction effect between 'State' and 'Year.' The p-value (0.458) indicates that there is no evidence to reject the null hypothesis, suggesting that the effect of 'Year' on 'Assault Cases' doesn't vary significantly across different 'States'.

Policy Implication: In conclusion, there isn't a significant overall effect of 'Year' on 'Assault cases' across all 'States'.

Part 5: Test for Murder Cases Registered

Objective: To check the impact of different states and years on Assault cases.

Analysis: We've employed Analysis of Variance (ANOVA) with the formula **Assault Cases ~ Year + Error (State / Year)**. This approach is well-suited for investigating the impact of the variable 'Year' on the response variable 'Cases,' while accounting for potential variations across States and within each State over different Years.

H0: The null hypothesis posits no significant relationship between the variables,

H1: Alternative hypothesis suggests a significant association between them.

Result:

```
Error: State
        Df  Sum Sq Mean Sq F value Pr(>F)
Residuals 34 5190777  152670


Error: State:Year
        Df Sum Sq Mean Sq F value Pr(>F)
Year      1    167   166.6    0.33  0.569
Residuals 34  17156   504.6
```

- **Error: State: Year**

F value: 0.33, Pr(>F): 0.569

This suggests the interaction effect between 'State' and 'Year.' The p-value (0.569) indicates that there is no evidence to reject the null hypothesis, suggesting that the effect of 'Year' on 'Murder Cases' doesn't vary significantly across different 'States'.

Policy Implication: In conclusion, there isn't a significant overall effect of 'Year' on 'Murder cases' across all 'States'.

Key Implication: Considering the above analysis, we can safely conclude that, there has been no significant variation in the Total Cases Registered, Rape Cases, Assault Cases and Murder Cases over 2014-16.