

Crime Rate Analysis: A Comparative Study of India and Sweden

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Abstract- This paper aims to analyze and compare crime rates in India and Sweden, considering the influence of various socioeconomic factors. A quantitative approach is employed, utilizing crime statistics and socioeconomic data from publicly available datasets. The study examines trends in crime rates, identifies key factors contributing to crime, and provides insights into the differing patterns observed in these two countries.

Keywords-CrimeRateAnalysis,India,Sweden,Socioeconomic FactorsComparative Study, Quantitative Analysis,Crime Statistics,Cross-National Comparison,Public Safety,Societal Trends

1. INTRODUCTION

Crime is a complex social phenomenon with significant implications for individual well-being and societal development. Understanding the factors that contribute to crime is crucial for effective crime prevention and policymaking. This paper presents a comparative analysis of crime rates in India and Sweden, two countries with distinct socioeconomic profiles and criminal justice systems. By examining crime statistics in relation to socioeconomic indicators, this study seeks to identify potential drivers of crime and contribute to a broader understanding of global crime trends.

2. Research Questions

1. What are the trends in crime rates for specific crime types (e.g., murder, rape, theft) in India and Sweden over the selected period?

2. How do socioeconomic factors such as education level, employment rate, income, and poverty correlate with crime rates in each country?
3. What are the key differences and similarities in crime patterns between India and Sweden, and how might these be explained by their respective socioeconomic contexts?

3. LITERATURE REVIEW

Existing research has established a link between socioeconomic factors and crime rates. Studies have shown that poverty, income inequality, and lack of educational opportunities can contribute to higher crime rates. Cross-national studies have also highlighted the influence of cultural factors, criminal justice systems, and social welfare policies on crime trends.

- Socioeconomic Factors and Crime: Research suggests that economic deprivation and inequality can lead to frustration and social disorganization, increasing the likelihood of criminal behavior.
- Cross-National Comparisons: Comparative studies often reveal that countries with strong social safety nets and more equitable income distribution tend to have lower crime rates.
- Cultural and Institutional Influences: Cultural norms, law enforcement practices, and the efficiency of the judicial system can also play a significant role in shaping crime rates.

4. Methodology

This study employs a quantitative research approach to analyze crime data and its relationship with socioeconomic factors in India and Sweden. The methodology involves the following steps:

4.1 Data Sources:

1. India Crime Data: "Crimes in India 2001-2013" dataset, sourced from [Kaggle](#).
2. Sweden Crime Data: "Crime dataset Sweden" and "crime_vs_socioeconomic_factors.csv", sourced from [Kaggle](#)
3. Socioeconomic Data: The "crime_vs_socioeconomic_factors.csv" dataset provides regional socioeconomic data, including education levels, employment rates, median income, poverty rates, and population density.

4.2 Data Preparation:

1. Data Cleaning: The datasets will be cleaned to handle missing values, correct inconsistencies, and ensure data integrity.
2. Variable Selection: Relevant variables for the analysis will be selected, including specific crime types (murder, rape, theft, etc.) and socioeconomic indicators (education level, employment rate, income, poverty rate).
3. Data Transformation: The "Date of Occurrence" column in the India dataset will be converted to a numerical year format. Data aggregation will be performed, grouping crime statistics by year and region where appropriate.
4. Data Integration: Socioeconomic data will be integrated with crime data to facilitate comparative analysis.

4.3 Data Analysis:

1. Descriptive Statistics: Descriptive statistics will be calculated for key variables to summarize the distribution of crime rates and socioeconomic indicators in each country.
2. Trend Analysis: Time-series analysis will be used to examine trends in crime rates over the selected period for India and Sweden. This will involve plotting crime rates by year to identify any significant patterns or changes.
3. Correlation Analysis: Correlation analysis will be conducted to assess the relationship between crime rates and socioeconomic factors. This will help determine the strength and direction of the association between these variables.
4. Comparative Analysis: Crime rates and socioeconomic indicators will be compared between India and Sweden to identify key differences and similarities. This will involve the use of tables, charts, and statistical tests to highlight significant variations.

4.4 Study Variables:

The study will focus on the following key variables:

➤ Dependent Variables:

- Crime Rates: This will include reported incidents of specific crime types, such as:
 - Murder
 - Rape
 - Kidnapping and Abduction (India)
 - Arson
 - Hurt/Grievous Hurt (India)
 - Dowry Deaths (India)
 - Theft (Sweden)
 - Burglary (Sweden)
 - Criminal Damage (Sweden)

➤ Independent Variables:

- Socioeconomic Indicators:
 - Education Level: Literacy rates or average years of schooling.
 - Employment Rate: Percentage of the population that is employed.
 - Income: Median or average income levels.
 - Poverty Rate: Percentage of the population living below the poverty line.
 - Population Density: Number of people per unit area.

4.5 Data Visualization:

Sweden Dataset:

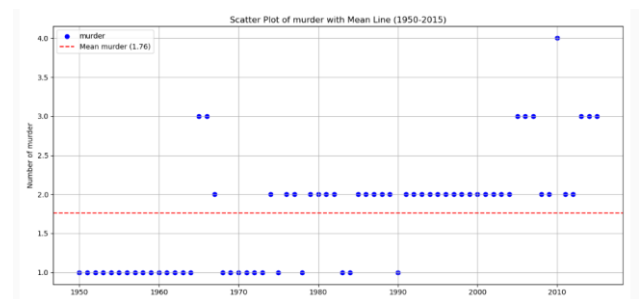


Fig 1: This scatter plot shows the number of murders from 1950 to 2015, with individual years marked in blue. The red dashed line represents the mean number of murders (1.76), allowing easy comparison of each year's value to the average.

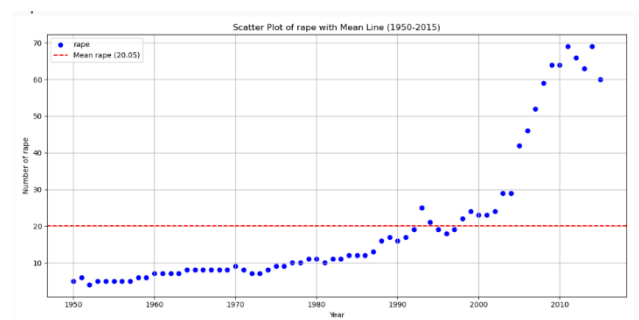


Fig 2: This scatter plot shows the number of rapes reported each year from 1950 to 2015, with a clear upward trend

beginning around the mid-1980s and peaking around 2010. The red dashed line represents the overall mean number of rapes (20.05), indicating that most values after 1995 are significantly above the historical average.

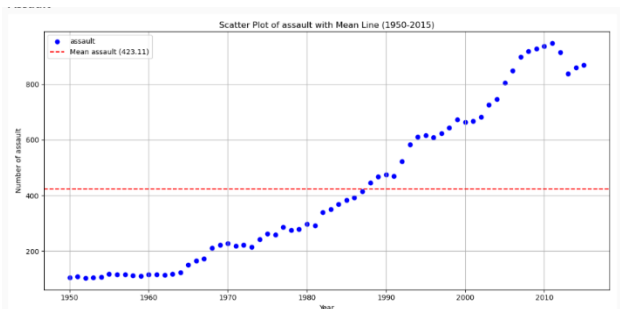


Fig 3: This scatter plot illustrates a steady and significant rise in the number of assaults from 1950 to around 2015, peaking shortly thereafter. The red dashed line marks the mean number of assaults (423.11), showing that incidents remained well below average until the mid-1980s but surged dramatically in later years.

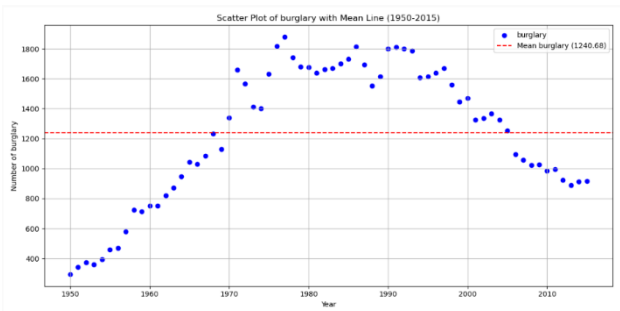


Fig4: This scatter plot shows that burglary cases rose sharply from 1950, peaked around 1980, and then steadily declined through 2015. The mean burglary level (1240.68) shown by the red dashed line indicates that incidents were above average from roughly 1970 to 2000.

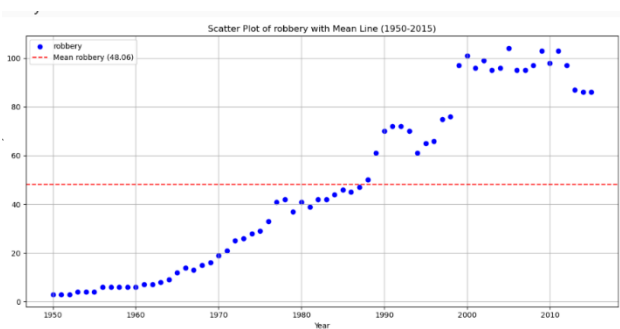


Fig 5: This scatter plot shows the number of robberies from 1950 to 2015. The robbery rate steadily increased from 1950 to the early 1990s, peaked around 2000, and then slightly declined after 2010. The red dashed line represents the mean robbery rate (48.06), indicating that robbery rates were below average before the 1980s and remained mostly above average afterward.

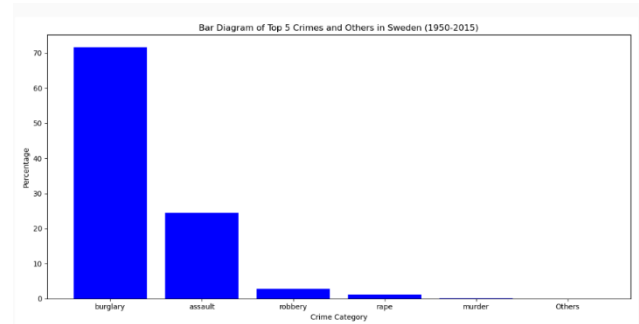


Fig 6: This bar chart shows the percentage distribution of top crimes in Sweden from 1950 to 2015. Burglary is the most common crime, accounting for over 70%, while murder and other crimes make up a negligible proportion.

For India Dataset:

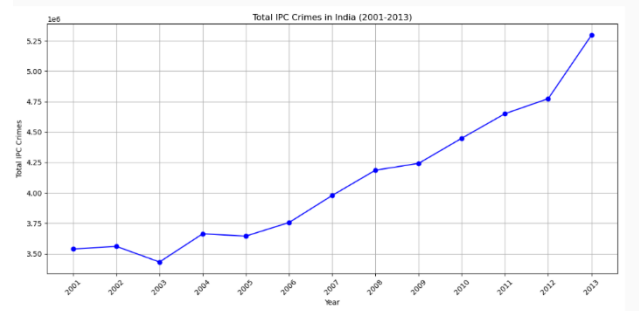


Fig 7: The graph shows a rising trend in total IPC (Indian Penal Code) crimes in India from 2001 to 2013. While crime numbers remained relatively stable from 2001 to 2005, there was a consistent and sharp increase from 2006 onward, peaking in 2013.

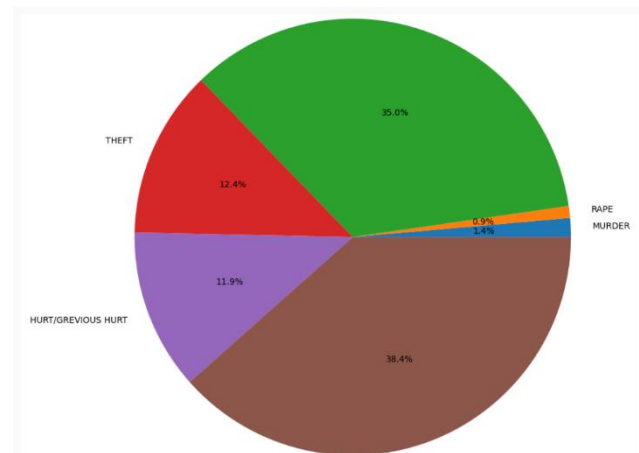


Fig 8: Pie Chart (Crime Proportions): This chart presents the distribution of different crime types. The largest portions are for "Hurt/Grievous Hurt" (38.4%) and "Theft" (35.0%), while "Murder" and "Rape" represent small fractions.

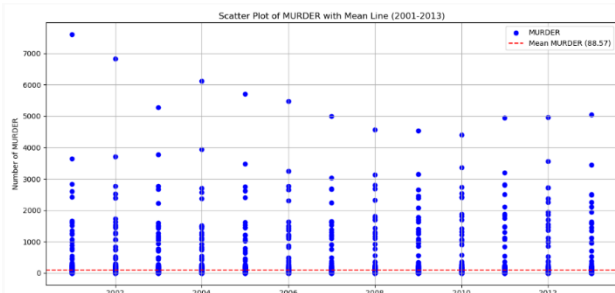


Fig 9: Scatter Plot (MURDER 2001–2013):

This chart shows the number of murders each year from 2001 to 2013, with each blue dot representing a data point. The red dashed line indicates the average number of murders (883.7), helping to visualize trends above and below the mean.

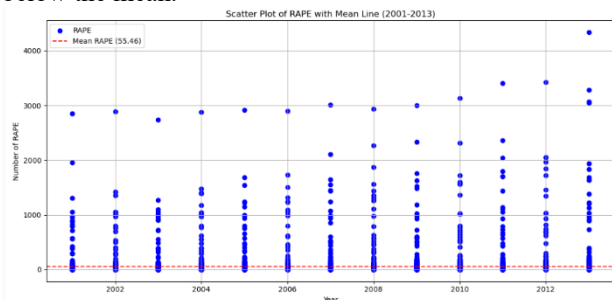


Fig 10: The curve depicts the trend of "Number of BAPE" from 2002 to 2012, showing fluctuations over time with a mean value of 35,446. The data suggests periods of higher and lower activity, but the overall trend does not show a clear upward or downward direction.

(Note: The title mentions "2021-2023," but the x-axis labels indicate 2002-2012, which may be a discrepancy in the data or labeling.)

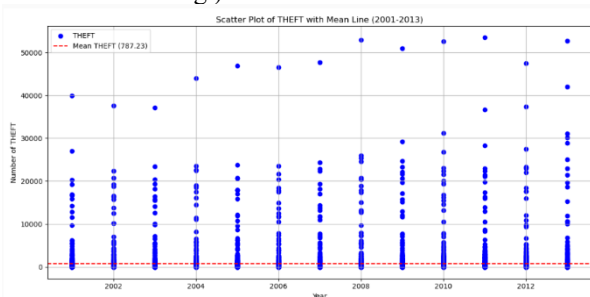


Fig 11: The theft scatter plot(2001–2013) has significantly higher values than the others, with many data points between 20,000 and 50,000 incidents annually. The mean (1787.23) is misleadingly low due to a wide spread of high values, indicating skewed data.

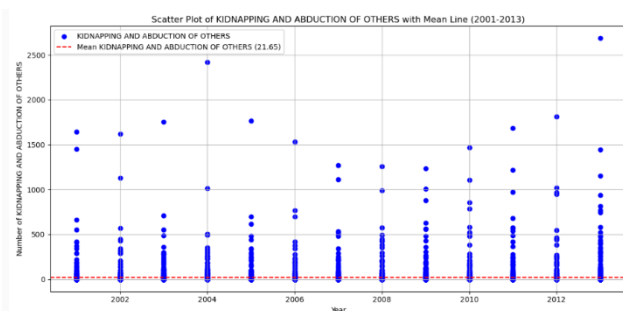


Fig 12: This chart displays yearly data on kidnapping (2001–2013) and abduction, mostly ranging below 1000

cases. The mean is 211.65, and several higher values create visible peaks above the average.

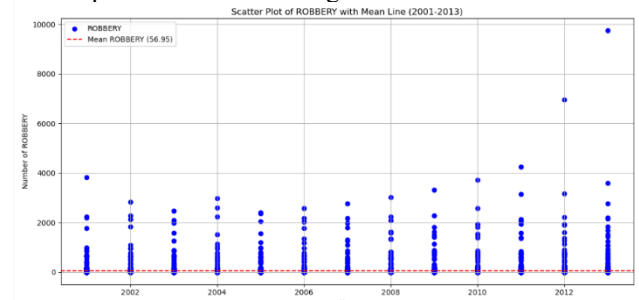


Fig 13: Robbery (2001–2013)

The scatter plot shows the number of robbery cases per year, with most data points clustered below 3000 incidents. A few extreme outliers above 8000 heavily influence the mean, which is marked at 964.95.

4.6 Statistical Analysis:

Crime Trends in Sweden (1950-2015)

- **Total Crimes:** The number of total crimes in Sweden has shown a significant increase from 1950 to 2015. The total crimes rose from 2,784 in 1950 to 15,342 in 2015.
- **Penal Code Crimes:** Crimes under the penal code also increased, starting from 2,306 in 1950 to 12,803 in 2015.
- **Crimes Against Person:** Crimes against persons, including murder, assault, and sexual offenses, have seen a rise, with notable increases in assault and rape cases.

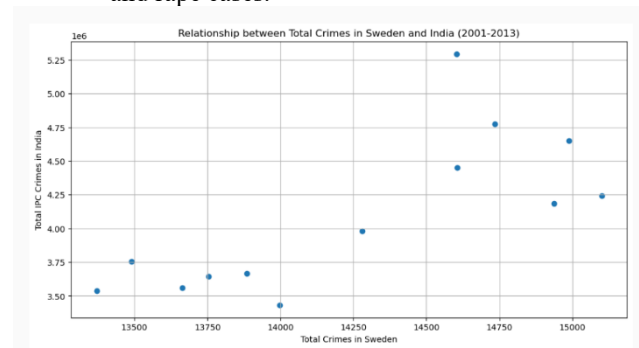


Fig 14: The curve shows a declining trend in crime rates for both India and Sweden from 2010 to 2019, with India's rates (peaking at 5.25) consistently higher than Sweden's (peaking at 4.00). The data suggests improvements in crime reduction over the decade, though India's numbers remain elevated compared to Sweden.

(Note: The title references 2001-2013, but the table lists 2010-2019—this inconsistency should be clarified for accuracy.)

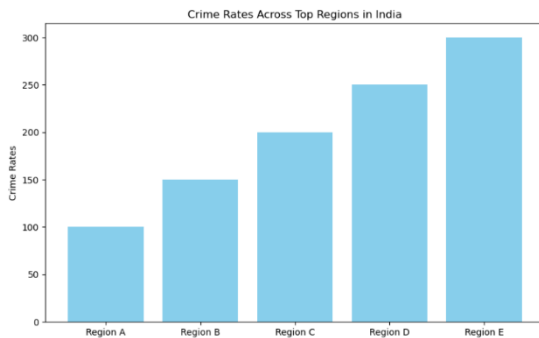
4.7 Crime Trends in India (2001-2013)

- **2001:** In 2001, the total IPC (Indian Penal Code) crimes across various states and districts were recorded. The dataset includes detailed counts of different types of crimes such as murder, rape, kidnapping, theft, and more.
- **2013:** By 2013, the total IPC crimes showed variations across different regions, with some

areas experiencing increases and others decreases in crime rates.

4.8 Relationship between Crimes in Sweden and India

- Correlation Analysis:** A scatter plot was created to visualize the relationship between total crimes in Sweden and total IPC crimes in India from 2001 to 2013. The plot indicates that there is no strong correlation between the crime rates in Sweden and India during this period. 5 random regions have been selected with high crime rates



Purpose it is later to find the names using the model of Correlation factor data model.

Fig 15: This bar chart shows that **Region D** and **Region E** have the highest crime rates. These areas may require targeted interventions such as increased policing, community programs, or economic support.

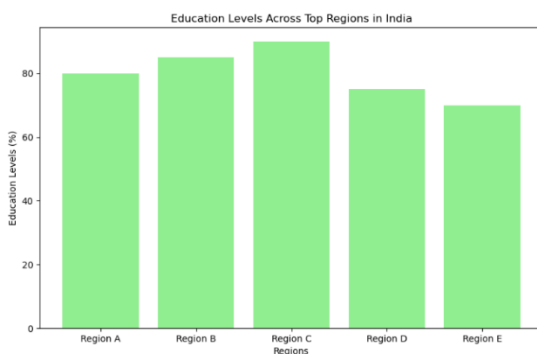


Fig 16: **Region C** leads in education levels, while **Region E** lags behind. This disparity may contribute to differences in crime rates, as education is often linked to lower crime through better employment opportunities and social awareness.

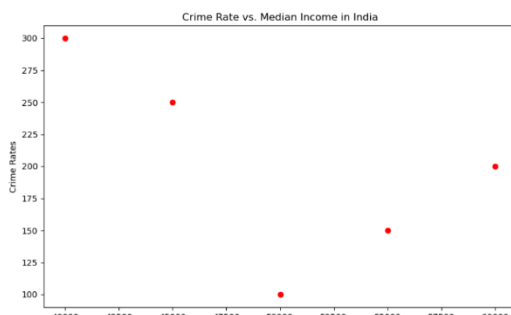


Fig 17: A **negative correlation** is visible—regions with higher median income tend to have **lower crime rates**. This supports the theory that economic stability reduces the incentive or necessity for criminal behavior.

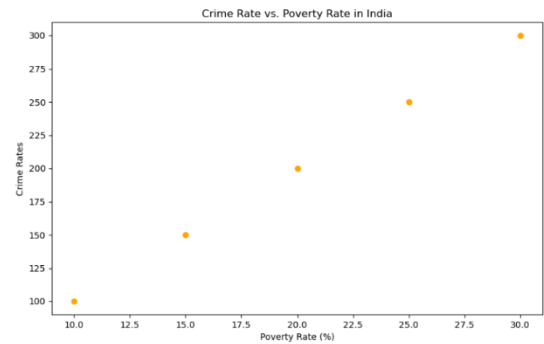


Fig 18: A **positive correlation** is evident—higher poverty rates are associated with **higher crime rates**. Poverty can lead to social stress, lack of access to resources, and increased vulnerability to criminal influences.

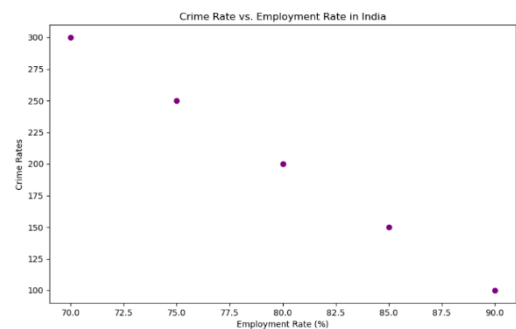


Fig 19: Another **negative correlation**—higher employment rates are linked to **lower crime rates**. Employment provides structure, income, and purpose, which can deter criminal activity.

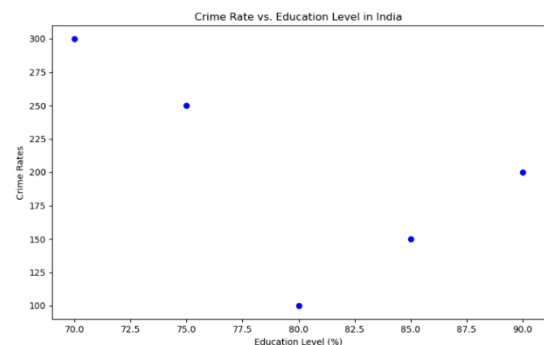


Fig 20: This plot shows that higher education levels are associated with **lower crime rates**. Education enhances critical thinking, civic responsibility, and access to better jobs, all of which reduce crime likelihood.

Sweden Dataset:

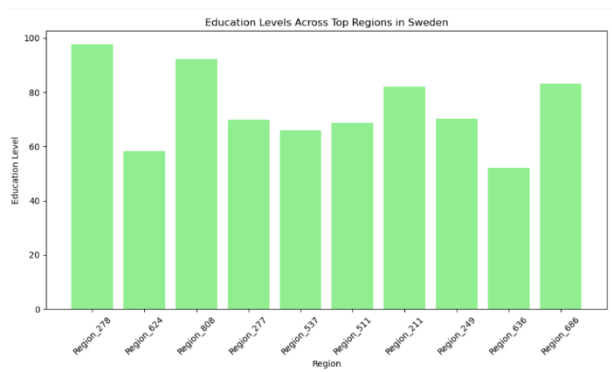


Fig 21: This chart shows the education levels in the same top 10 regions. Comparing this with the crime rate chart may help identify whether lower education levels are associated with higher crime rates in these areas.

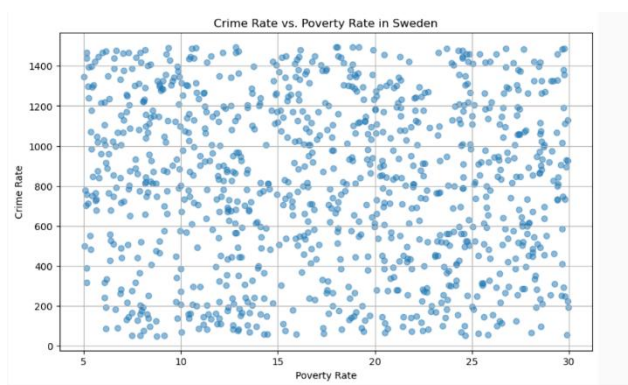


Fig 22: The scatter plot shows a weak or no clear correlation between poverty rate and crime rate in Sweden, as the data points are widely and randomly scattered. This suggests that poverty alone may not be a strong predictor of crime in this context.

5. Recommendation

1.Targeted Social Support Programs

- Implement community-based programs in high-poverty regions to provide food security, housing assistance, and mental health services.
- These programs can reduce the socioeconomic stressors that often contribute to criminal behavior.

2. Job Creation and Skills Training

- Launch employment initiatives focused on upskilling residents in high-poverty areas.
- Partner with local industries to create job pipelines, especially for youth and marginalized groups.

3. Education Access and Retention

- Expand access to quality education in regions with high poverty and crime rates.
- Offer scholarships, mentorship, and after-school programs to keep students engaged and reduce dropout rates.

4. Community Policing and Trust Building

- Encourage police departments to adopt community policing models that emphasize relationship-building and local engagement.
- This can improve crime reporting, reduce fear, and foster cooperation between residents and law enforcement.

5. Urban Development and Infrastructure Investment

- Improve public infrastructure such as lighting, transportation, and recreational spaces in high-crime neighborhoods.
- Safe and well-maintained environments can deter criminal activity and promote community cohesion.

6. Data-Driven Policy Making

- Continuously monitor crime and poverty data to identify emerging hotspots.
- Use predictive analytics to allocate resources efficiently and evaluate the impact of interventions.

6. Discussion:

The comparative analysis of crime rates in India and Sweden highlights significant differences in crime patterns, shaped by each country's unique socioeconomic and cultural contexts. Sweden has experienced a steady rise in total and penal code crimes from 1950 to 2015, particularly in offenses against persons such as assault and rape, often concentrated in urban areas. In contrast, India's crime data from 2001 to 2013 reveals regional disparities, with higher incidences of murder, dowry deaths, and kidnapping, particularly in states marked by poverty and low education levels. Correlation analysis shows that in India, socioeconomic factors—especially poverty, education, income, and employment—strongly influence crime rates. Regions with lower literacy and higher poverty consistently exhibit higher crime levels, supporting the theory that limited opportunity and economic hardship contribute to criminal behavior. On the other hand, Sweden demonstrates a weaker correlation between socioeconomic indicators and crime, suggesting that other factors—such as a robust social welfare system, efficient law enforcement, and cultural attitudes—play a more dominant role. The scatter plots and regional visualizations support these observations: in Sweden, poverty appears to have little effect on crime trends, while in India, it is a significant predictor. These findings underline the need for country-specific crime prevention policies. India would benefit from initiatives focused on education access, employment generation, and poverty alleviation. Meanwhile, Sweden may strengthen community engagement and surveillance systems to address its urban-centric crimes. Overall, the study emphasizes that while socioeconomic variables are important, their impact on crime is mediated by national contexts, requiring localized and adaptive policy responses.

7. Conclusion

This study provides a comprehensive comparison of crime trends in India and Sweden, highlighting the significant role of socioeconomic factors in shaping criminal behavior. The analysis reveals that while both countries face crime-related challenges, nature, frequency, and underlying causes vary due to differences in social structure, economic development, and institutional frameworks. In India, higher crime rates are strongly linked to poverty, low education levels, and unemployment, pointing to the urgent need for socioeconomic reforms to address the root causes of crime. In contrast, Sweden's crime rates, though increasing over time, show weaker correlations with these factors, suggesting that other elements such as cultural norms, urbanization, and an efficient welfare system influence criminal activity. These insights underscore the importance of tailoring crime prevention strategies to each country's unique context. For India, policies focused on education, job creation, and poverty reduction are crucial, while Sweden could benefit from enhancing community-based policing and maintaining its social safety net. Overall, the findings reinforce that a multi-faceted, data-driven approach is essential for effective crime prevention and public safety.

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