Geographical perspective of crime pattern in Delhi: An Analysis of secondary and empirical data

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ABSTRACT

The growing crime rate is a concern, and it needs the utmost attention to put a cap on its growth. In Delhi NCT, the IPC crime growth rate in 2021 was 447.16 per cent; in 2011, it was -1.90 per cent. Therefore, in this paper, an emphasis is placed on analyzing the temporal and spatial aspects of crime. Crime data are collected from the National Crime Records Bureau, and socio-economic data is collected from the District Census Handbook and Statistical Abstracts for the study. Data are processed in an Excel sheet and ArcGIS for representation in pictorial forms and run in SPSS to determine crime correlates. Further, it is denoted that the crime has positive bearings with illiterates, non-workers, literates, workers, and the SC population.

Keywords: IPC Crimes, Punishment, Temporal, Spatial and Growth Rate.

1. INTRODUCTION

Crime occurs worldwide, and numerous circumstances influence the outcome of a crime (Murataya and Gutiérrez, 2013). The amount of crime reflects the morality of people in the community and society (Falkner, 1897), indicating that the lower the moral values, the higher the crime rate.It is born after when every human being on their part feels the sense of doing right and wrong. It is the sense of mind that repulse upon the acts and words spoken to him/her by anyone of belonging, whether to own family, neighbour, peer groups, or strangers. It denotes a kind of change in human behaviour impelling towards committing any anti-social activity. Besides an act and words, a behaviour is influenced by some other factors such as biological, sociological, psychological, economic, environmental, geographical and many more. To ascertain the links with some of the above factors, several theories have been propounded by numerous scholars and researchers to obtain the ground facts for the origin of crime. Cesare Lombroso, an Italian psychiatrist, examined crime from a biological perspective and found that the physical aspects of the body, like inherited genes, evolution, structures of the brain, and hormones, influence human behaviour. Developmental Life-Course theory on crime throws light on the processes of development beginning before birth. It continues till life experiences a change in behaviour at different stages of development caused by interactions of individual and social factors. The psychological theory examines the cognitive development of human beings and their behaviour moulding towards crime. The sociological perspective explains the effects of social conditions and the organization of society acting as external factors that give shape to crime. The Chicago School/Social Disorganization Theory by Clifford R.Shaw and Henry D.Mc-Kay (1942) says that an area equipped with poor housing, poor health, socio-economic disadvantage and transient populations reflects a higher pattern of delinquency, indicating crime as a function of neighbour dynamics (SCCJR, 2016). Geography explains the effects of location and environment on crime and reflects distributional patterns.

Defensible Space theory explores the connections between physical environments and criminal activity.The Broken Window theory, given by James Wilson and George Kelling (1982), reflects on the weakness of a neighbourhood or society on the grounds of weak security and poor maintenance where the offenders easily enter the society and commit crimes and escape from the site. Such neighbourhoods are spotted as 'Black Spot' (Wilson and Kelling, 1982). Economic perspective in crime reveals the offences enhanced by incentives and offenders pulled in for-profit motives. Anomie/Strain Theory: The Anomie concept was developed by Emile Durkheim, the father of sociology, who explained that rapid social change is caused by the breakdown of social norms. Robert Merton (1957), a sociologist from the United States,

argues that crime arises from a disconnect between society's cultural objectives (such as financial success and prestige) and the legitimate avenues available to attain them (like education and job opportunities). Therefore, the tension between available means and desired goals creates frustration and anger, prompting individuals to resort to unlawful methods to achieve success.

But, this paper aims to focus on the aspects of geography in crime, which is a never-ending issue worldwide. An analysis of crime is done by Delhi NCT, comprising temporal and spatial context, to understand the persisting factors that generate crime. It is also referred to as a geography of crime, defined by Georges (1978) as "the study of the spatial manifestation of criminal acts. It is the studyof the social andcultural organization of criminal behaviour from a spatial perspective". Crime geography is a study that encompasses examining crime, its effects, offences, and offenders to gain a deeper understanding of its influence on society and spatial dynamics (Mayhew, 2009). Further, it explores the impact of environmental factors like community ecology and structure on criminal activities and their results. It involves spatial analysis of various elements, including the time and day of the crime, location, characteristics of victims and offenders, the residence of the perpetrator, and the physical, economic and political context (Georges-Abeyie & Harries, 1980). The factors outlined earlier can increase the chances of criminal activity and becoming a victim. The relationship between crime and geographic area has been analyzed from multiple perspectives.Geographers have employed cartographic methods to elucidate the disparities in crime distribution across different places and spaces (Kim, M. 2014).Upon creating and comparing crime maps with social, economic, and demographic data maps, a strong correlation is revealed between an area's characteristics and crime rate.Numerous crime pattern maps of large American cities from the early 20th century highlighted the significance of environmental and regional factors in comprehending crime patterns. Initial research employing deterministic methods primarily focused on the relationship between crime and environmental factors.Researchers have linked climate factors, such as temperature, humidity, seasonality, and geographic factors, to both violent and property crimes(Dexter, 1904; Cohen, 1941).Certain studies have utilized man-made physical environments, including land use patterns, transportation infrastructure, and the design and layout of buildings, to account for geographic differences in crime rates while highlighting the shortcomings of relying on natural physical environments for crime prediction(Harries, 1980).In the early 1800s, A. M. Guerry in France and A. Quetelet in Belgium made independent observations that areas with warmer climates and warmer months experienced higher rates of crimes directed at individuals.Additionally, they noted increased property crimes in colder climates and during winter months. Quetelet interpreted these observations as the "thermic law of delinquency."(Cohen, 1941; Harries, 1980).Cohen (1941, p. 32): "The geographers are apparently not sufficiently interested in crime to study the relationship, and the criminologists are not disposed to regard investigations of the physical phases of geography and climate as promising much insight into criminal behaviour."Interest in the cartographic/deterministic approach to crime geography waned, giving rise to an ecological approach developed by the Chicago School of Sociology in the early twentieth century.Ecological studies typically focus on the variation of crime within a city.A central tenet of the ecological approach is that the attributes of a location and place are as important, if not more so, than an individual's characteristics in predicting the likelihood of criminal activities (Kim, Moonsun 2014).The primary findings suggest that offence patterns in Chicago are geographically differentiated and that there is an inverse relationship between crime rates and the distance from the city centre (Shaw, Zorbaugh, McKay,& Cottrell, 1929; Shaw & McKay, 1942).Ecological studies on crime generally suggest that crimes and criminals tend to cluster in areas where local social organization is weakly established(Rossomo, 2000).In1970s and 1980s, the geography of crime emerged as a subdiscipline within geography, gaining popularity, and environmental criminology was established as a distinct perspective within the field of criminology(Brantingham & Brantingham, 1981; Evans & Herbert, 1989; Harries, 1974; Herbert, 1982).

It has been pointed out that regional variations in crime may be attributed to various factors such as community types, population demographics, police practices, and even the pervasive yet enigmatic cultural atmospheres, which were not directly measured or excluded from the studies (Ennis, 1967). The analysis of crime variations by city included social, cultural, and structural variables such as city size, population age, gender structure, minority population, type of settlement, immigration, church membership, income, unemployment, and home ownership, among others(Ferdinand, 1964; Ogburn, 1935; Schuessler, 1962; Schuessler & Slatin, 1964). Research has indeed shown that weather can influence crime rates. For instance, when the weather is pleasant, people tend to spend more time outside, leaving their homes unattended and potentially increasing the risk of property crimes like theft and burglary(Murataya and Gutiérrez, 2013). This aligns with the routine activity theory, which suggests that crime rates can be affected by changes in daily activities and mobility patterns due to weather conditions. Cohn's (1990) study is a fascinating example of how environmental factors like temperature can influence

crime rates. His research found that as temperatures rose above 85°F, the likelihood of riots and communal aggression increased. This positive correlation between heat and crime suggests that higher temperatures can exacerbate tensions and lead to more violent behaviour.Harries and Standler used the Discomfort Index (DI) method to assess the thermal stress caused by the humidity effect and temperature and ambient temperature (Harries & Standler, 1988).Horrocks and Menclova's (2011) research touches on the rational choice theory in the context of crime. This theory posits that criminals make decisions based on a cost-benefit analysis. When houses on the street are unoccupied, burglars might target the most expensive house, as the expected benefits (e.g., valuable items) outweigh the perceived risks or costs (e.g., getting caught). This aligns with the broader concept that a crime will be committed if its expected utility exceeds the expected costs, including opportunity costs. This rational choice framework helps explain why certain properties might be more attractive targets under specific conditions. Horrocks and Menclova hypothesize that adverse weather conditions can lead to a reduction in property crimes. The rationale is twofold:Reduced Motivation: Bad weather conditions, such as heavy rain or extreme cold, can deter criminals from engaging in outdoor activities, including committing crimes. Increased Occupancy: During bad weather, people are more likely to stay indoors, making houses less attractive targets for burglars due to the higher risk of encountering occupants.This hypothesis aligns with the broader understanding that environmental factors, including weather, can significantly influence criminal behaviour and decision-making.Field discovered a link between higher temperatures and increased property crime. Rising temperatures increased property crime, including auto theft and burglary (Field, 1992).Ellen G. Cohn's 1990 study explored the relationship between high temperatures and various types of crime, including robbery, homicide, domestic violence, and rape. The study found that:Assaults, domestic violence, and rape tend to increase with higher temperatures, at least up to about 85°F. The relationship between heat and homicide is less clear, with mixed findings. High temperatures do not appear to be strongly correlated with robbery. Cohn's research contributes to the broader understanding of how environmental factors like weather can influence criminal behaviour.Cesare Lombroso, a pioneering figure in criminology, explored a wide range of factors that he believed influenced criminal behaviour. His work included examining Meteorological and climatic influences: Lombroso suggested that weather and climate could impact crime rates. Geographical conditions: He considered how different terrains and locations might affect criminal activity. Race and civilization: Lombroso theorized that certain races and levels of civilization were more prone to crime. Population density: He examined how crowded living conditions could lead to higher crime rates. Alcoholism: The role of alcohol consumption in fostering criminal behaviour was another focus. Education: Lombroso believed that lack of education could contribute to criminal tendencies. Economic conditions: He examined how poverty and economic hardship could drive people to crime. Religion: The influence of religious beliefs and practices on crime was also considered. Sex and age: Lombroso studied how gender and age affected criminal behaviour. Civil status: He examined how marital status and family life might influence crime. Prisons: The impact of the prison system on criminal behaviour was another area of interest. Political conditions: Lombroso explored how political environments and changes could affect crime rates (Ellwood,1912). Lombroso's theories were groundbreaking at the time, though many have since been criticized or debunked. His work laid the foundation for modern criminology, emphasizing the need to consider a wide array of factors in understanding crime.Lombroso says the criminal is "a savage and at the same time a sick man.He also states, "Crime is a conduct, and conduct is a habit".

2. Study area

Delhi is an ancient historic city today (w.e.f February 1, 1992) known as the National Capital Territory of Delhi (Census of India 2011, N.C.T of Delhi). It is located between 28° 25" to 28° 53" North latitude and 76° 50" to 77° 22" East longitude and has remained a seat of power for a number of dynasties and mighty empires for several centuries. The name Delhi was derived from the name Raja Dhilu or Dhillu, whose reign period was unknown, and later, it was founded by Tomaras, the Rajputs of Tunvar. After independence in 1952, a Legislative Assembly was set up and continued till November 1 1956, when the Central Administration was reintroduced in Delhi. 1966 a Metropolitan Council was set up, and it still exists. The only tehsils of Delhi during 1961 were divided into two named Delhi and Mehrauli between 1961-71, which remained till 1981-91. In 1997, NCT Delhi was decentralized and divided into nine districts with three tehsils. Today, there are 112 villages and 113 towns (3 Statutory Towns and 110 Census Towns) sprawled over an area of 1483 sq. km. Haryana bounds it in the South and North West and by Uttar Pradesh in the East across the river Yamuna. Its length and breadth extensions are around 53 and 48 km. Sloping down from north to south direction. Its altitude ranges between 213 to 305 metres above sea level. The whole district is divided into three parts: Yamuna Flood and Piedmont Plains, the Ridge and the Plains. The climatic conditions vary due to its location and prevailing continental air. Its mean

temperature ranges from 8.9°C to 40.9°C, and average annual rainfall is 617mm. 176.20 sq. km. of the area is under forest cover (Census of India 2011, N.C.T of Delhi). The total population is 167.87 lakhs; the sex ratio is 868, density is 11320 (Census 2011).
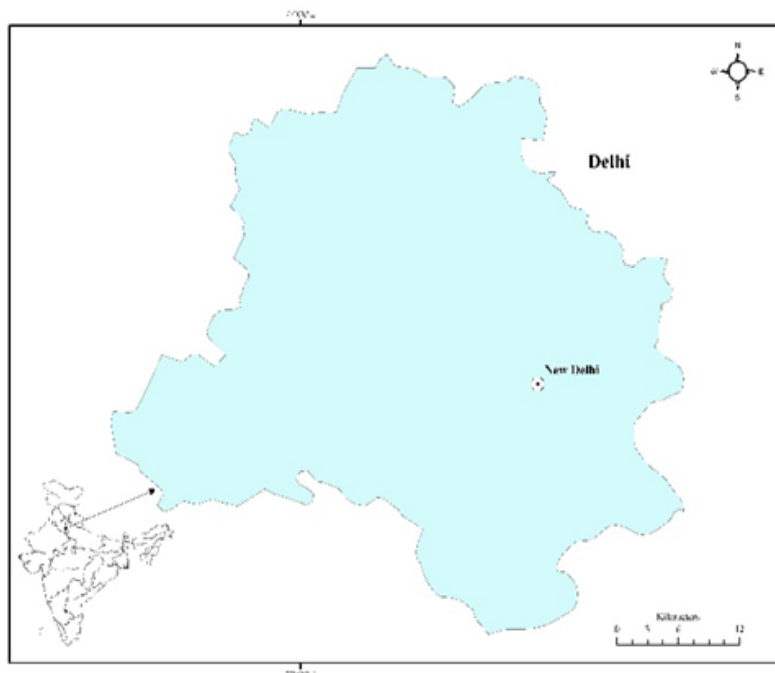


Figure. 1: Study area- Delhi

Crime is a never-ending phenomenon across the world. In India, Delhi NCT has continuously maintained its rank first among all its states and UTs in terms of crime from past to present. According to the National Crime Records Bureau 2022 (NCRB), crimes in Delhi were very high, with 300429 cases recorded, up from 249192 in 2020. In 2021, the number of crimes registered was 291904, representing an increasing trend.

3. MATERIALS AND METHODS
The material of the study is retrieved from secondary sources. Crime data is taken from the book 'Crime in India' (Year 2001-2022) prepared by the National Crime Records Bureau (NCRB), Ministry of Home Affairs. As per broad categories prepared by NCRB, there are 86 types of crime labelled by the Indian Penal Code (IPC) code; out of them, 60 per cent are selected for analysis. Sixty per cent of the total 86 is 51.7 per cent, rounding to 52 per cent, which is considered for the study. These 52 types of crime are further selected from the classes based on punishment terms beginning from the death penalty to punishment below 1 year. There are 9 classes of punishment varying in tenure, like up to death, life imprisonment, 10 years, 7 years, 5 years, 3 years, 2 years, 1 year and below 1 year. These data are processed in Excel to prepare bar graphs and pie charts and ArcGIS to prepare maps. Socio-economic data is taken from Delhi's District Census Handbook and Statistical Abstracts. All cognizable IPC crimes that occurred between 2020-22 are categorized based on punishment terms inked in IPC and are accordingly analyzed further. SPSS tool is employed to assess the correlates of crimes.

4. RESULTS AND DISCUSSION
Stacksof varying height in Figure 2 depict several cognizable IPC crimes that occurred from 2001 to 2022. It is observed that an offence since 2001 inclined and declined with a greater or lesser number of incidences till 2022. Out of it, the most remarkable increases in the number of crimes were seen from 2014 onwards till 2022. In 2013, the number of incidences registered was between fifty thousand and 1 lakh and reached around 1 lakh fifty thousand in 2014. The year 2022 recorded an astonishing figure of about three lakhs of incidences. These crimes are the cause of a cluster of problems arising out of interactions between people in the society or neighbourhood and many other associated factors at large, as per the reviewed literature.
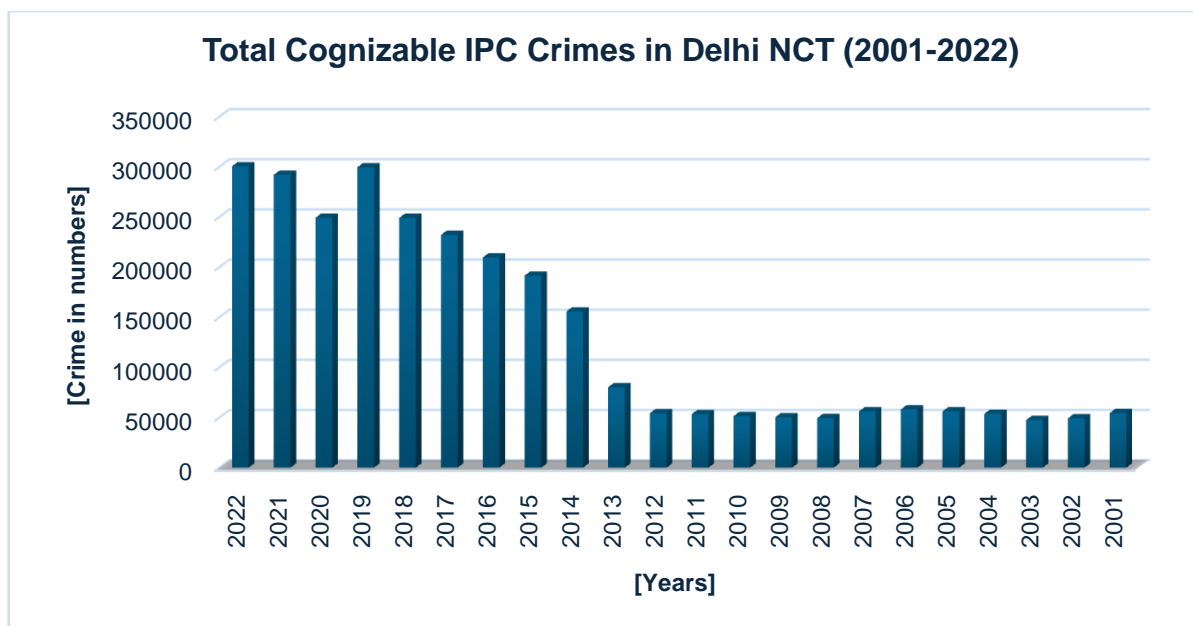
Fig.2: Total Cognizable IPC Crimes in Delhi NCT (2001-2022)
Source: Crime in India2020 NationalCrime RecordsBureau, Ministry of Home Affairs, GOI.
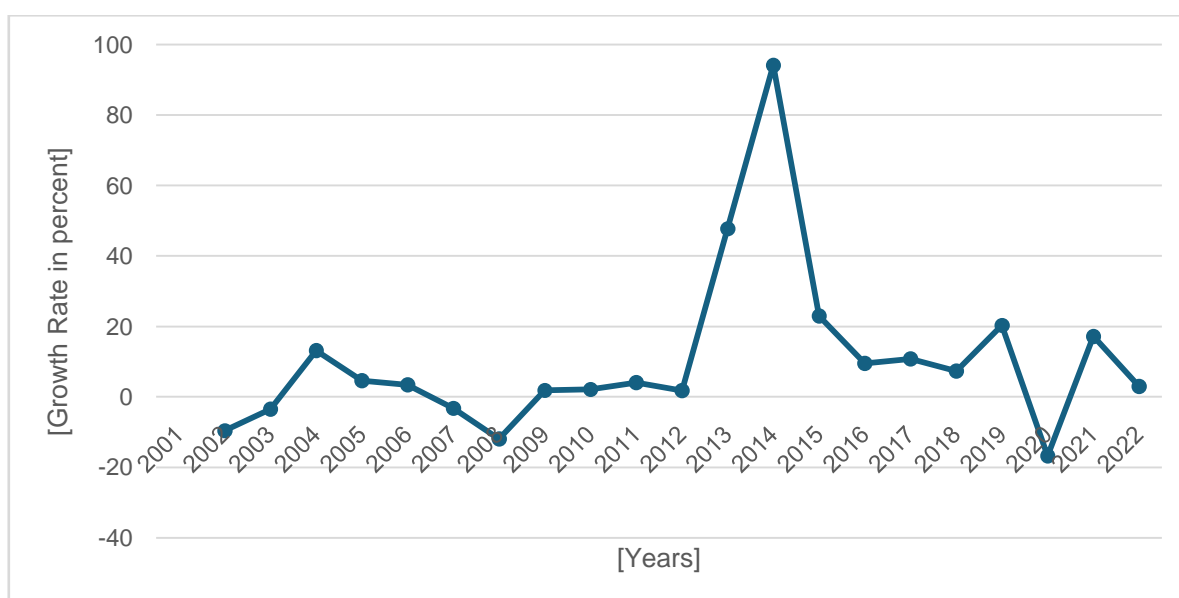
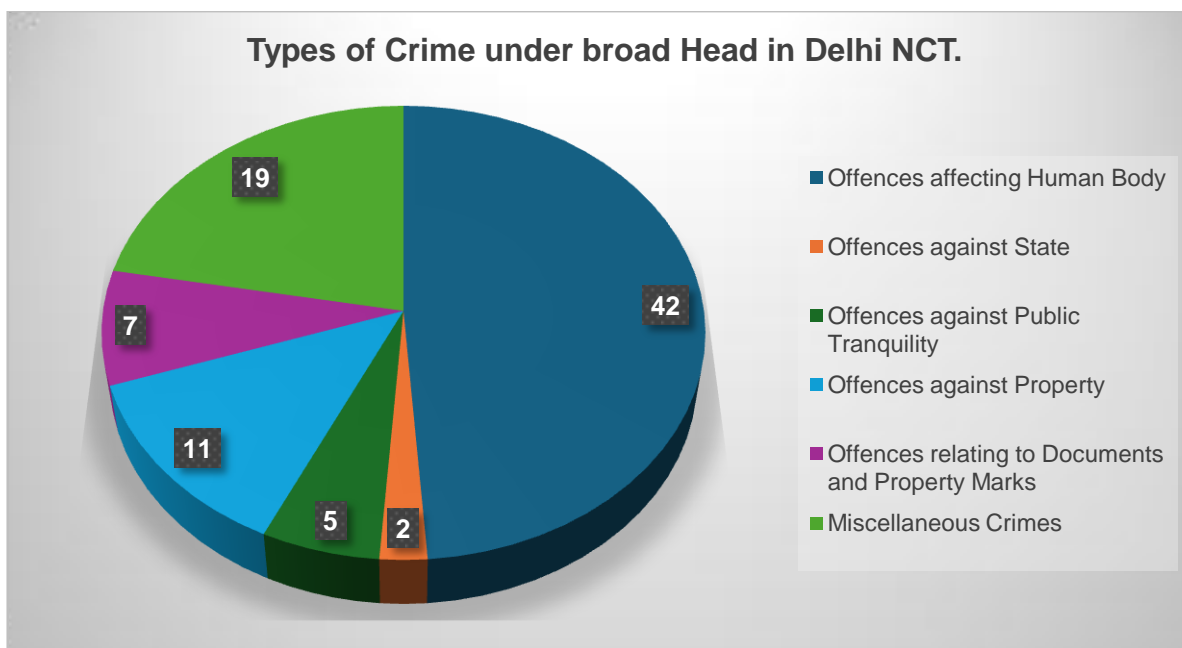**Figure 3:** Cognizable IPC Crime Growth Rate in Delhi NCT (2001-22)
Source: Crime in India2020, 2021 & 2022, National Crime RecordsBureau, Ministry of Home Affairs, GOI.

The zig-zagline in Figure 3 represents the growth rate of cognizable IPC crimes per cent between 2002 and 2022. An irregular trend is noticed in the figure, from -9.65 per cent in 2002 to 2.92 per cent in 2022. Between 2002 and 2022, the growth rate soared to 94.12 per cent in 2014 and dipped to -16.79 per cent in 2020. The crime rate was inclined to 17.14 per cent in 2021. Variation in the growth rate of crime is the result of an interplaying of several factors like social (educational status), economic (including migration, per capita income and employment) and political, which have also been supported by similar views or findings of Arora (2018).

The pie chart (Fig. 4) presents the types of crime in the numbers listed in NCRB under the broad heading. According to it, Offences affecting the Human Body have 42 types of crime, Offences against the State have 2 types, Crimes against Public Tranquility include 5 categories, Crimes against Property consist of 11 categories, Crimes concerning Documents and Property Marks are made up of 7 categories, and Miscellaneous Crimes encompass 19 categories of criminal activity.All mentioned offences are assigned with sections by IPC that have punishment terms.

Fig.4: Types of Crime under broad Head in Delhi NCT.
Source: Crime in India2020, 2021& 2022, National Crime Records Bureau, Ministry of Home Affairs, GOI.

Figure 5 presents punishment-wise types of IPC crimes with the number of incidences occurring under the administrative area of 15 Police Stations of Delhi NCT between 2020 and 2022. These crimes are listed under 9 classes of punishment, as shown in the piechart legend. It is observed that a large number of crimes have occurred under the class of 3 Years' Punishment (584473), followed by up to 1 Year's Punishment (151110).

The number of crimes under different types (Head) shown in Figure 6 represents a combined record of three consecutive years: 2020, 21 and 22. It is observed that the crime Attempt to Commit Murder (Sec.307 IPC) was very high (total of 2026 incidences), occurring mainly in South District 227 incidences. Its reason for occurrences is several factors, out of which few are evidenced by the correlation matrix showing a positive relation with illiterate (r= .957), non-workers (r=.935), SC (r=.935) and literate (r=.913). About 91 per cent of the variance of crime Attempts to Commit Murder is explained by illiterates, 87 per cent each by non-workers and SC and 83 per cent by literate determined by their coefficient of correlation value (R^2).
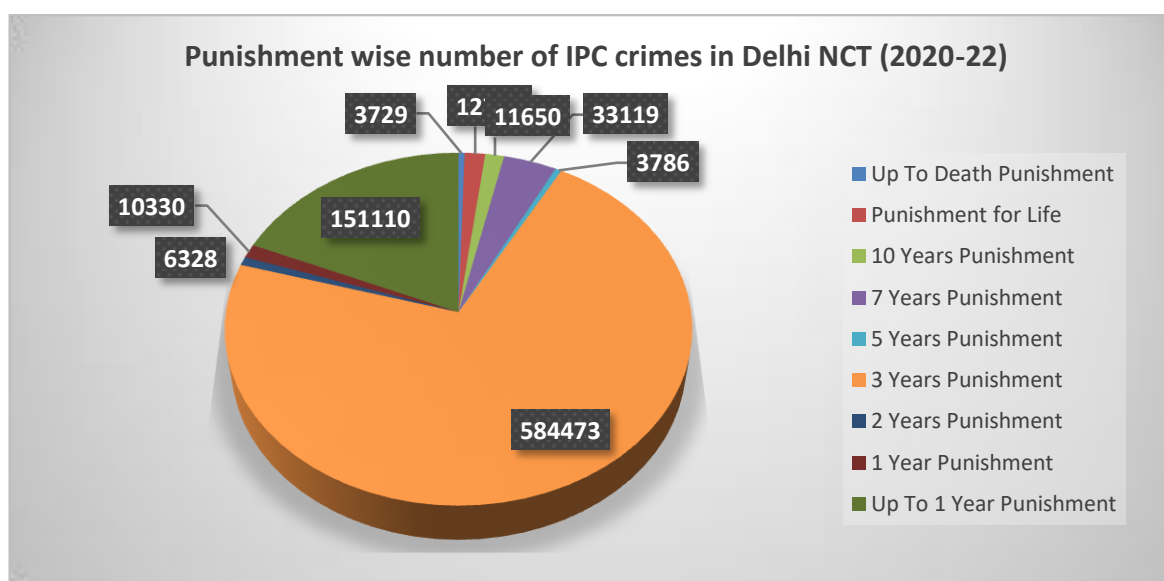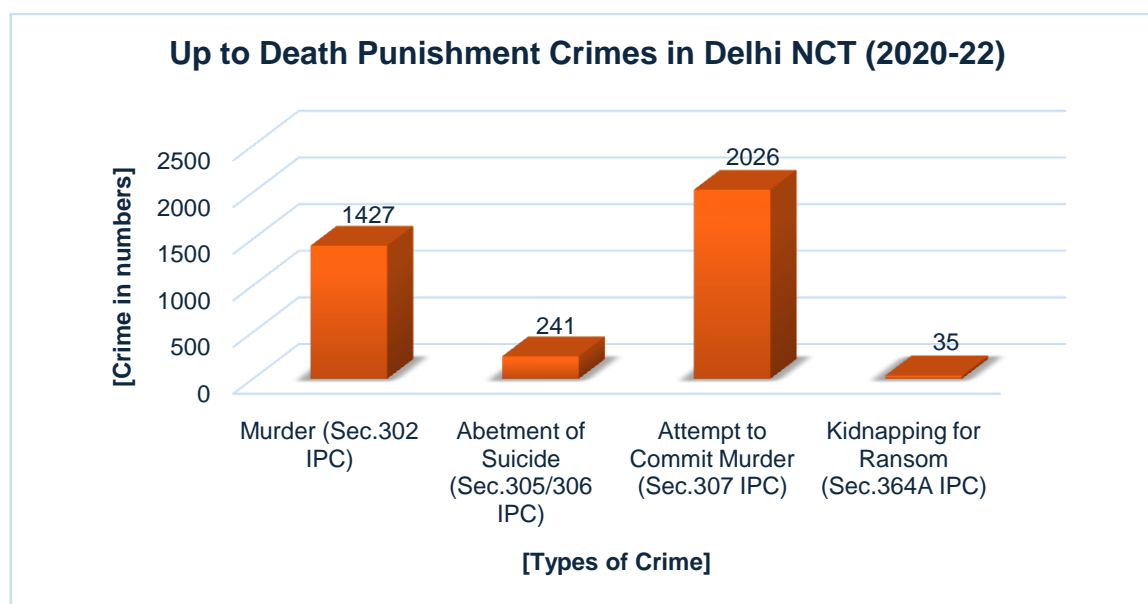

Fig.5: Punishment-wise number of IPC crimes in Delhi NCT (2020-22)
Source: Crime in IndiaNational Crime RecordsBureau, Ministry of Home Affairs, GOI.

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A total of 1427 cases of crime Murder (Sec.302 IPC) took place in Delhi NCT. In the northeast district, the incidences were highest at 178. This crime has a strong positive relation with SC Population (r=.973), illiterate population (r=.967), non-workers (r=.935), literate population (r=.908) and total workers (r=.902) known by their r value (Table. 1). Further, the R^2 value as an explained factor expresses the commitment to crime by the SC population (97 per cent), illiterate (93 per cent), non-workers (87 per cent), literates (82 per cent) and total workers (81 per cent). Under the crime of Abetment of Suicide (Sec.305/306 IPC), 241 cases occurred, the maximum of which was in Rohini (29). Thirty-five kidnapping cases for Ransom (Sec.364A IPC) occurred, mostly in districts Central (8 cases). It is concluded that in districts like South, North East, Rohini, and Central, the number of crimes under the up-to-death Penalty category was very high.

Many crimes occur daily, and punishment is decided on the severity after several trials in court. It's a challenging decision to pronounce the type of punishment inked in the IPC. Life imprisonment or 14 years of punishment is vested on the types of crime committed, as is mentioned in Figure 7. It is evidenced from the figure that out of 11 types of crime, robbery and rape recorded an astonishing number exceeding the 3000 mark. Robbery (Sec.392/394/397 IPC) registered a remarkable number of 6084 cases that mainly occurred in the North East district (670 cases), East district (510 cases) and South district (504 cases). The remaining districts recorded below 500. This crime has a strong positive correlation with illiterates (r=.975), SC (r=.955), and non-workers (r=.953). Ninety-five per cent of the variance of crime robbery is explained by illiterates, 91 per cent by the SC population, and 90 per cent by non-workers, determined by their coefficient of correlation value (R^2).

Fig.6: Up to Death Punishment Crimes in Delhi NCT (2020-22)
Source: Crime in India, National Crime RecordsBureau, Ministry of Home Affairs, GOI.

Rape (Sec.376 IPC) incidences occurred mainly in districts Dwarka (392 cases) and South East (337 Cases), whereas in other districts were below 300. Such heinous crime showed a positive relationship with total workers (r=.890), literates (r=.883), non-workers (r=.872) and illiterates (r=.855). It is noted 79 per cent of the variance of crime rape is explained by total workers and the remaining 21 per cent by other forces, 77 per cent by literates, 76 per cent by non-workers and 73 per cent by illiterates as determined by their R^2. Apart from these explained factors, other factors are also involved in this crime.

A total of 680 incidences of Criminal Breach of Trust (Sec.406 to 409 IPC) were registered throughout Delhi NCT. Out of these, the maximum incidences were found in districts Shahdara (77 cases) and North (70 cases), whereas the remaining districts were below 70. This crime is closely associated with illiterates (r=.851), non-workers (r=.823) and SC (r=.814), known by their r-value (Table. 1). Seventy-two per cent of the variance of crime Criminal Breach of Trust is explained by illiterates, 67 per cent by non-workers and 66 per cent by SC population known by R^2 value and approximately 30 to 35 per cent of involvement in this crime was from other unexplained factors.

Crime like Criminal Trespass (Sec.447 to 452 IPC) mainly occurred in district Dwarka (92 cases). Total workers (r=.765), literates (r=.755), non-workers (r=.732), and illiterates (r=.702) have associations with this crime known by their r value. Approximately 55-60 per cent of the variance of this crime is explained

by total workers (58 per cent), literates (57 per cent), non-workers (53 per cent) and, illiterates (49 per cent) and other factors explain the remaining 40 per cent. Extortion & Blackmailing (Sec.384 to 389 IPC) crime has mostly taken place in districts like Dwarka (64 cases). Total workers (r=.931), literates (r=.926), non-workers(r=.917), illiterates (r=.902) and SC population (r=.868) showed a positive relation. Eighty-six per cent of the variance of crime is explained by total workers, 85 per cent by literates, 84 per cent by non-workers, 81 per cent by illiterates, 75 per cent by SC population and the remaining 20-25 per cent by other unexplained factors. A total of 380 incidences of Dowry Deaths (Sec.304-B IPC) have occurred during 2020-22, out of which the maximum took place in districts North East (63 cases). The r values .945 of illiterates, r .929 of non-workers, r .904 of literates, r .890 of workers (Table 1), and r .886 of the SC population are associated with dowry death. It is noted by the coefficient of correlation value (R^2) that 89 per cent variance of dowry death is explained by illiterates, 86 per cent by non-workers, 81 per cent by literates, 79 per cent by workers and 78 per cent by SC population and about 21 per cent by unexplained factors.

Crime like Arson (Sec.435, 436 & 438 IPC) occurred highly in the Outer (31 cases) district of Delhi NCT. The crime of intentionally inflicting severe injury using dangerous weapons or methods (Sec.326 IPC) was most prevalent in the North East, with 44 reported cases in the district. A large number of crimes of Infanticide, Miscarriage, Abandonment and Foeticide (Sec.313 to 318 IPC) were reported from the South West (22 cases) district. Incidences of Culpable Homicide not amounting to Murder (Sec.304 IPC) were seen highest in the districts of North East (35 cases). Among all types of crime under Life Imprisonment, Dacoity (Sec.395/397 IPC) recorded the lowest (51 cases). A large number of cases of dacoity were reported from Central (31 cases) districts.

From the discussion, it is found that crimes under the Life Punishment category took place mainly in the Police Districts like North East, East, South, Dwarka, South East, Shahdra, North, Dwarka, South West, and Central.
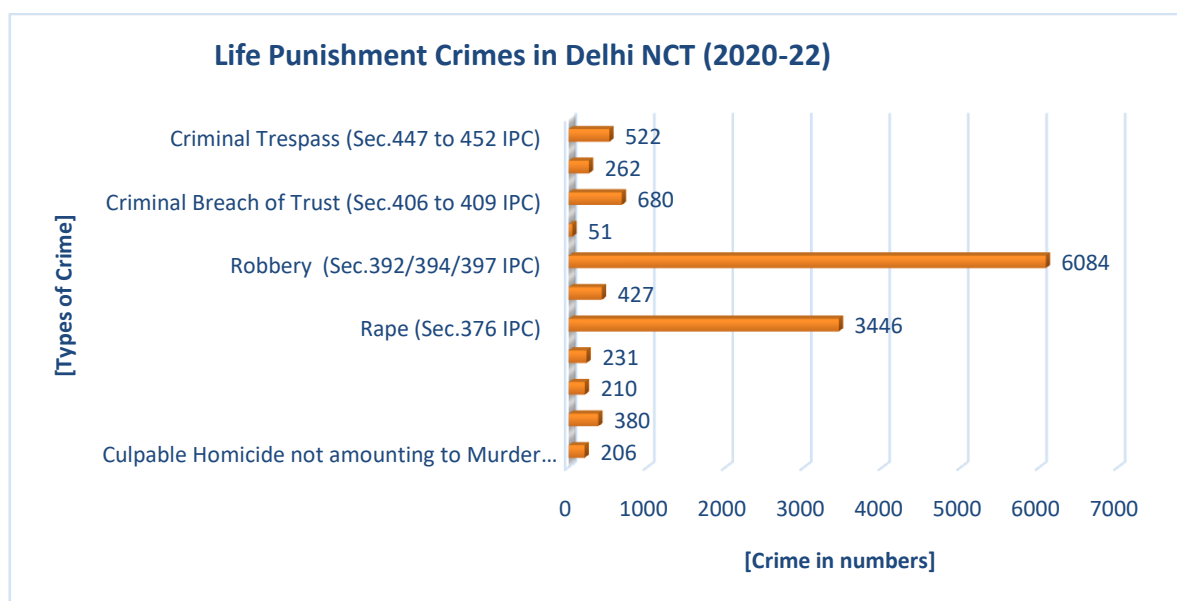
Figure 7: Life Punishment Crimes in Delhi NCT (2020-22)
Source: Crime in India, National Crime RecordsBureau, Ministry of Home Affairs, GOI.

Types of crime under Ten Years Punishment are shown in Figure 8. Among all, crime Burglary (Sec.454 to 460 r/w Sec. 380 IPC) recorded highest number of cases, 11016. Districts South East (1168 cases), Outer (1033 cases), North (1007 cases) and Dwarka (1002 cases) recorded cases above 1000. This crime bears close association with workers (r=.945), literates (r=.939), non-workers (r=.926) and illiterates (r=.907) denoted by r value (Table 1). R^2 value represents the variance of crime burglary with workers (89%), literates (88%), non-workers (85%) and illiterates (82%) as an explained factor. It is further noticed that this crime is committed at large and at night. The records show that 7579 cases at night and 3437 daily cases have occurred. It seems the offenders feel less risky at night and commit crimes twice the number of incidences committed in the daytime.

Overall, 389 cases of crime Other Simple Hurt (Sec.327,328,330 & 334 IPC) were registered; out of that, the most occurred in districts North East (68 cases). One hundred ninety-three incidences of Human Trafficking (Sec.370 IPC) have taken place, and most of them were committed in district Outer North (50

cases). A total of 18 crimes of Acid Attack (Sec.326A IPC) were recorded, and the maximum was in the East (3 cases) district. The crime of kidnapping and abduction of women for the purpose of marriage (Sec. 366 IPC) was most prevalent in the South East district, with 4 cases reported and in the Outer district, with 3 cases.

Hence, it is concluded that crimes under the Ten-Year Punishment class were high in police districts South-East, Outer, North, Dwarka, North-East, East, and Outer North of Delhi NCT.

Figure.8: Ten Years Punishment Crimes in Delhi NCT (2020-22)
Source: Crime in India 2020, 2021 & 2022, National Crime in India 2020, 2021 & 2022, National RecordsBureau, Ministry of Home Affairs,GOI.

Types of crime under the Seven Years Punishment class are shown in Figure 9. There are 8 types of crime, and among them, incidences of kidnapping and Abduction (Sec. 363 IPC) were very high. Out of 14129 cases, the maximum crime took place in districts Outer North (1806 cases) and North East (1442 cases), whereas in other districts, it recorded below 1400. It has a strong relation (r-value) with illiterates (r=.976), SC (r=.965), non-workers (r=.964), literates (r=.951) and workers (r=.949). Variance of crime kidnapping and abduction is explained by factors of illiterates (95%), SC (93%), non-workers (92%), literates (90%) and workers (90%).

Apart from this, incidences of cheating (Sec.420 IPC) were also on the rise, and 7975 cases were registered. It reported highest above 900 in the districts of South East (1080 cases) and Dwarka (922 cases). It has a close association with workers (r=.751), literates (r=.730), non-workers (r=.693), illiterates (r=.653) and SC population (r=.592). The variance of crime is explained by workers (56%), literates (53%), non-workers (48%), illiterates (42%) and SC (35%) determined by R^2 and approximately 45 per cent is explained by unexplained factors.

The total Fraud cases recorded was 3938 in three years. These cases mainly occurred in districts Dwarka (515 cases) and South West (499 cases) and were reported below 499 in the remaining districts. Out of total fraud cases, 574 were done with Banks, 247 with ATMs, 572 with Credit Cards and 2545 under other types of fraud. This crime is closely associated with workers (r=.696), literates(r=.695), non-workers (r=.690), and illiterates (r=.677). R^2 expresses variance of crime-fraud is 48 per cent each by workers and literates, 47 per cent by non-workers and 45 per cent by illiterates, and unexplained factors cause the remaining approximately 50 per cent.

Motives of Kidnapping & Abductions are several, and accordingly, different Sections by IPC are assigned. Similarly, for crime under Other Kidnapping & Abduction, a total 3071 number of cases have been recorded under different sections 365,367,368 and 369 of IPC. Out of the total Outer and South East districts registered cases above 450. The r value of workers (r=.835), literates (r=.824), illiterates and non-workers (r=.820 each) indicates a positive relation with other kidnappings and abductions. About 69

per cent of the variance of crime is explained by workers, 67 per cent each by literates, illiterates and non-workers known by R^2. Approximately 31 per cent is explained by unexplained factors.

Fig.9: Seven Years Punishment Crimes in Delhi NCT (2020-22)
Source: Crime in India, National Crime in India 2020, 2021 & 2022, National RecordsBureau, Ministry of Home Affairs,GOI.

Attempt to Commit Culpable Homicide (Sec. 308 IPC) crime registered 1910 cases and mostly committed in districts South (221 cases), South East (197 cases) and East (191 cases) and other remaining districts recorded below 190. Further, it was noticed that it has a strong positive relationship with workers (r=.929), literates (r=.923), and non-workers (r=.911). As explained by R^2, the variance of crime is 86 per cent by workers, 85 per cent by literates, and 82 per cent by non-workers.There were 973 cases of assault or use of Criminal force on women with intent to Disrobe. This type of crime has mostly occurred in district Dwarka (217 cases), and all other districts registered below 200. A total of 854 cases of crime under Voluntary Causing Grievous Harm were registered. Districts South East and South recorded cases above 100. It is concluded that in districts Outer North, North East, South East, Dwarka, South West, Outer, South, and East, the maximum number of crimes under the Seven Years Punishment class occurred during 2020-22.

Under the Five Years Punishment class, a large number of incidences registered was Assault on Women (Sec.354 IPC), shown in Figure 10. A total of 2885 cases were reported in the police stations of Delhi NCT between 2020-22. South East Police District registered 472 cases, whereas other districts recorded cases below 300. It has a positive relation with workers (r=.813), literates (r=.805), and non-workers (r=.801), known by their r value. About 66 per cent of the variance of crime is explained by workers and 64 per cent each by literates and non-workers. Approximately 45 per cent is explained by unexplained factors.

Crime Stalking (Sec.354D IPC) registered 831 cases, mostly in district Dwarka of Delhi NCT. It has a positive relation with workers (r=.852), literates (r=.841), and non-workers (r=.815). Seventy-two per cent of the variance of Stalking is explained by workers, 70 per cent by literates, 66 per cent by non-workers, and approximately 30 per cent is caused by unexplained factors.Crime Promoting enmity between groups recorded 42 offences, mostly from district Dwarka (10 cases). Crime of Circulating False/Fake News/Rumours recorded 27 cases, 14 reported from the West district alone. The volume of crime in this class is comparatively low compared to other courses. Hence, it is examined that South East and Dwarka districts registered the maximum number of crimes under the Five Years Punishment class.

5 Years Punishment Crimes in Delhi NCT (2020-22)
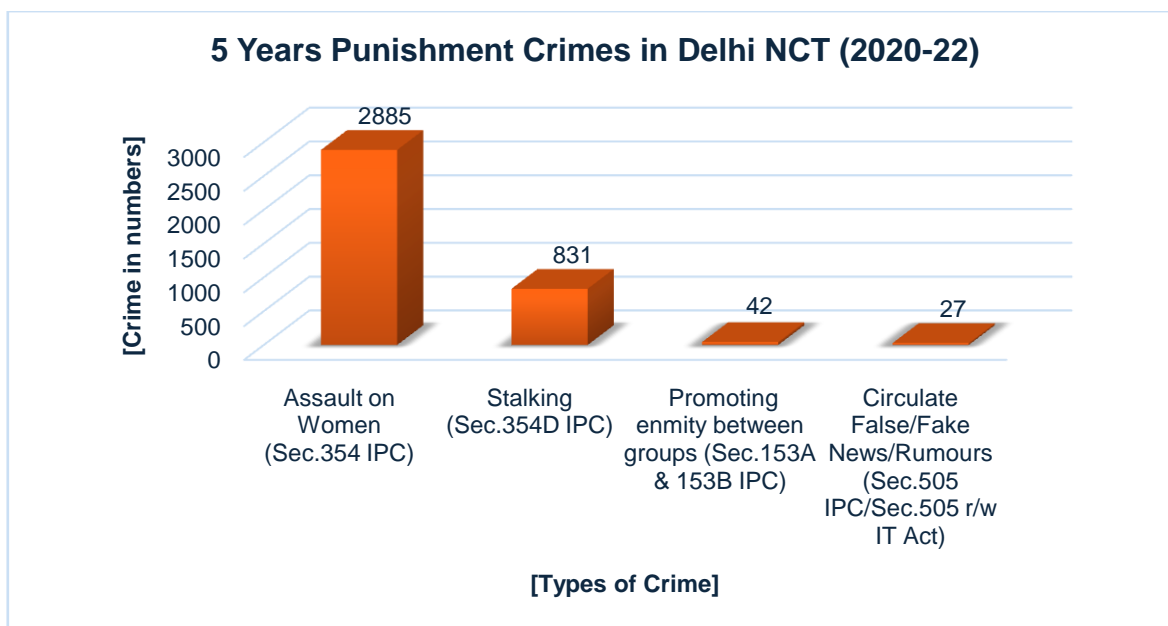
Figure 10: Five Years Punishment Crimes in Delhi NCT (2020-22)
Source: Crime in India, National Crime in India 2020, 2021 & 2022, National RecordsBureau, Ministry of Home Affairs,GOI.

Crime Theft (Sec.379 IPC) under the class of 3 Years Punishment ruled over other types of crime. The total number of theft incidences recorded was 567571 in the Police Stations of Delhi NCT during 2020-22 (Figure: 11). Police districts North East (54214 cases) and North West (53760 cases) registered the maximum number of theft cases. Out of total theft, 110771 were auto/motor vehicle theft cases, and 456800 cases were other thefts.It's a matter of concern that this crime takes place very often on the premises of Delhi NCT and is voluminously large among all types of crime.Research has shown that when the weather is pleasant, people often spend more time outdoors, leaving their homes unattended and potentially increasing the risk of property crimes like theft and burglary (Murataya and Gutiérrez, 2013). This aligns with the routine activity theory, which suggests that crime rates can be affected by changes in daily activities and mobility patterns due to weather conditions.Illiterates (r=.980), non-workers (r=.977), literates (r=.964) and SC (r=.946) are closely associated (Table 1). Its variance is represented as illiterates 96 per cent, non-workers 95 per cent, literates 92 per cent and SC 89 per cent as explained factors for theft. 12051 number of incidences of Cruelty by Husband or his Relatives (Sec.498A IPC) is another type of crime that has taken place against women, and most of them were reported from district Dwarka (1429 cases), North East (1230 cases), West (1106 cases) and remaining districts recorded below 1100. It has a strong bearing on illiterates (r=.945), non-workers (r=.939), literates (r=.921) and workers (r=.908) known by their r value. Determined by R^2, its variance is 89 per cent by illiterates, 88 per cent by non-workers, 84 per cent by literates and 82 per cent by workers.
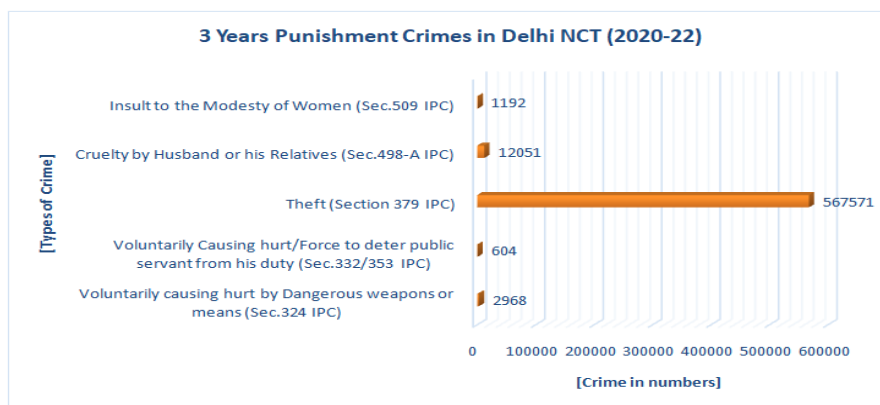
Figure 11: Three Years Punishment Crimes in Delhi NCT (2020-22)
Source: Crime in India, National Crime in India 2020, 2021 & 2022, National RecordsBureau, Ministry of Home Affairs,GOI.

Crime Voluntarily causing hurt by Dangerous weapons or means (Sec.324 IPC) registered 2968 cases, mostly occurring in districts North East (327 cases) and Central (298 cases), whereas in the remaining districts, the number was below 290. Illiterates (r=.914) and SC (r=.901) have positive relations, showing an impact on crime. About 83 per cent of the variance of crime is explained by illiterates and 81 per cent by the SC population.Crime Insult to the Modesty of Women (Sec.509 IPC) recorded 1192 incidences mostly reported from districts Dwarka (178 cases), South East (172 cases) and in other district records were below 170 (fig.10). Workers (r=.754), literates (r=.734) and non-workers (r=.701) possess a positive relationship. 56% of workers, 53% of literates, and 49% of non-workers represent as explained factors of crime and approximately 45% of crime is explained by unexplained factors.Crime Voluntarily Causing Hurt/Force to deter public servants from their duty registered 604 cases, out of which Dwarka district reported the highest number, 80, and the remaining districts reported below 60. It is estimated that crimes under the Three Years Punishment class were high in the districts of the Northeast, North West, Dwarka, West, North East, Central, and South East.

Table 1: Co-Relation of Crime.

| Correlation Matrix Table									
Variables		**x1**	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**
Total Pop	**x1**	1	.165	.999**	.987**	.996**	.999**	-.073	.970**
Sex Ratio	**x2**	.165	1	.155	.191	.134	.179	.864**	.220
Total Lit	**x3**	.999**	.155	1	.977**	.999**	.995**	-.089	.960**
Total Illit	**x4**	.987**	.191	.977**	1	.970**	.993**	-.024	.982**
Total Workers (M+M)	**x5**	.996**	.134	.999**	.970**	1	.990**	-.124	.956**
Non-wor..	**x6**	.999**	.179	.995**	.993**	.990**	1	-.048	.974**
Density	**x7**	-.073	.864**	-.089	-.024	-.124	-.048	1	-.053
SC Pop	**x8**	.970**	.220	.960**	.982**	.956**	.974**	-.053	1
Murder (Sec.302 IPC)	**y1**	.927**	.170	.908**	.967**	.902**	.937**	-.072	.973**
Attempt to Commit Murder (Sec.307 IPC)	**y2**	.929**	.220	.913**	.957**	.910**	.935**	-.026	.935**
Dowry Deaths (Sec.304-B IPC)	**y3**	.918**	.208	.904**	.945**	.890**	.929**	.109	.886**
Rape (Sec.376 IPC)	**y4**	.880**	.066	.883**	.855**	.890**	.872**	-.159	.817**
Extortion & Blackmailing (Sec.384 to 389 IPC)	**y5**	.923**	-.033	.926**	.902**	.931**	.917**	-.216	.868**
Robbery (Sec.392/394/397 IPC)	**y6**	.942**	.342	.924**	.975**	.911**	.953**	.123	.955**
Criminal Breach of Trust (Sec.406 to 409 IPC)	**y7**	.811**	.353	.793*	.851**	.781*	.823**	.147	.814**
Criminal Trespass (Sec.447 to 452 IPC)	**y8**	.744*	-.212	.755*	.702*	.765*	.732*	-.359	.646
Burglary (Sec.454 to 460 r/w Sec.380 IPC)	**y9**	.935**	.171	.939**	.907**	.945**	.926**	-.140	.877**
Attempt to commit Culpable Homicide (Sec.308 IPC)	**y10**	.919**	.163	.923**	.893**	.929**	.911**	-.126	.881**
Kidnapping and Abduction (Sec.363 IPC)	**y11**	.961**	.098	.951**	.976**	.949**	.964**	-.138	.965**
Other Kidnapping & Abduction (Sec.365, 367, 368, 369 IPC)	**y12**	.827**	.033	.824**	.820*	.835**	.820**	-.215	.767*
Fraud (Sec.420 r/w Sec.465,468-471 IPC/IT Act)	**y13**	.693*	-.258	.695*	.677	.696	.690*	-.353	.625
Cheating (Sec.420 IPC)	**y14**	.714*	-.108	.730*	.653	.751*	.693*	-.332	.592
Assault on Women (Sec.354 IPC)	**y15**	.807**	-.006	.805**	.797*	.813**	.801**	-.230	.754*
Stalking (Sec.354D IPC)	**y16**	.829**	.113	.841**	.782*	.852**	.815**	-.091	.722*
Voluntarily causing hurt by Dangerous weapons or means (Sec.324 IPC)	**y17**	.880**	.478	.863**	.914**	.854**	.890**	.261	.901**
Theft (Section 379 IPC)	**y18**	.973**	.243	.964**	.980**	.957**	.977**	.026	.946**
Cruelty by Husband or his Relatives (Sec.498-A IPC)	**y19**	.931**	.146	.921**	.945**	.908**	.939**	.030	.875**
Insult to the Modesty of Women (Sec.509 IPC)	**y20**	.720*	-.076	.734*	.665	.754*	.701*	-.291	.613
Causing Death by Negligence (Sec.304-A IPC)	**y21**	.911**	-.057	.910**	.898**	.920**	.903**	-.346	.902**
Rioting (Sec.1470151 IPC)	**y22**	.149	.330	.112	.255	.066	.189	.631	.144
Causing Grievous Hurt by Rash/Negligent Driving on Public (Sec.279 r/w 338 IPC)	**y23**	.897**	-.009	.896**	.884**	.905**	.891**	-.258	.902**
Offences relating to Religion (Sec.295 to 297 IPC)	**y24**	-.076	-.610	-.065	-.107	-.053	-.087	-.477	-.162
Voluntarily Causing Simple Hurt (Sec.323 r/w 341/342 IPC)	**y25**	.888**	.252	.868**	.929**	.850**	.903**	.158	.872**
Sexual Harassment (Sec.354A IPC)	**y26**	.806**	.052	.810**	.780*	.810**	.801**	-.067	.741*
Disobedience to order duly promulgated by Public Servant (Sec.188)	**y27**	.929**	.255	.920**	.942**	.917**	.932**	.007	.926**
Rash Driving on Public Way (Sec.279 or Sec.279 r/w 336/Other IPC)	**y28**	.650	-.379	.673*	.570	.689*	.628	-.462	.491
Causing Hurt by Rash/Negligent Driving on Public Way (Sec.279 r/w 337 IPC)	**y29**	.913**	-.076	.917**	.886**	.927**	.904**	-.329	.841**
Obstruction on Public way (Sec.283 IPC)	**y30**	.201	.334	.215	.156	.240	.181	.076	.145
Total Crime	**y31**	.966**	.238	.959**	.972**	.954**	.969**	.008	.939**
**. Correlation is significant at the 0.01 level (2-tailed).									
*. Correlation is significant at the 0.05 level (2-tailed).									

Crime Causing Death by Neglect (Sec.304A IPC) under 2 Years Punishment class recorded 4532 incidents, as shown in Figure 12. It was reported mostly from districts Outer North (538 cases). This crime is assisted by incidences occurring due to negligence related to deaths on roads and railways accidents, medical negligence, civic bodies negligence and other negligence. As per NCRB records, negligence shown on the road caused death due to road accidents was 3785, no records of railway, the number of deaths due to medical negligence was 7, deaths due to negligence of civic bodies was 33, and due to other negligence was 710. Deaths on the roads caused by hit and run recorded 1806 incidences, and by other accidents registered 1979 cases. Further, it is noticed that there exists a strong positive relationship with workers (r=.920), literates (r=.910), non-workers (r=.903) and SC population (r=.902). About 84 per cent of the variance of crime causing death by negligence is explained by workers, 82 per cent by literates and 81 per cent each by non-workers and SC population determined by R^2.

A total of 822 cases of crime Rioting were recorded between 2020-22, and the maximum was in district North East (683 cases). The types of rioting that took place were like-Communal/ Religious (520 cases),

industrial, political (5 cases), caste conflict, students (2 cases), money dispute (1 case), water dispute, land/property dispute (2 cases), family disputes (5 cases), enmity/rivalry (7 cases), electricity/power supply disputes, rioting while in andolan/morcha (27 cases),Rioting/Attacks on Police Personnel or Govt Servants (16 cases) and other rioting (237 cases). There exists a poor positive relationship with explained factors like density (r=.631), illiterates (r=.255), non-workers (r=.189), and SC population (r=.144). Approximately 95 per cent of the variance of crime is due to unexplained factors.

Crime Causing grievous hurt by rash/negligent driving on Public registered 555 cases, out of which the highest 96 cases were reported from district Dwarka and the remaining district registered cases below 60. It is closely associated with workers (r=.905) and SC population (r=.902). Eighty-one per cent of crime variance is explained by workers and the SC population. Two hundred ninety-six forgery cases were registered and reported, mainly from the New Delhi (126 cases) district. Dwarka (22 cases) and Outer (21 cases) districts reported the highest number of crimes causing grievous hurt by acts that endangered the life/safety of others. Twenty-three cases of Offences relating to Religion have occurred. Dwarka (9 cases) reported the highest number of crimes related to religion. Outer North, West, North East, Dwarka, and New Delhi districts reported the highest number of crimes under the Two-Year Punishment class.
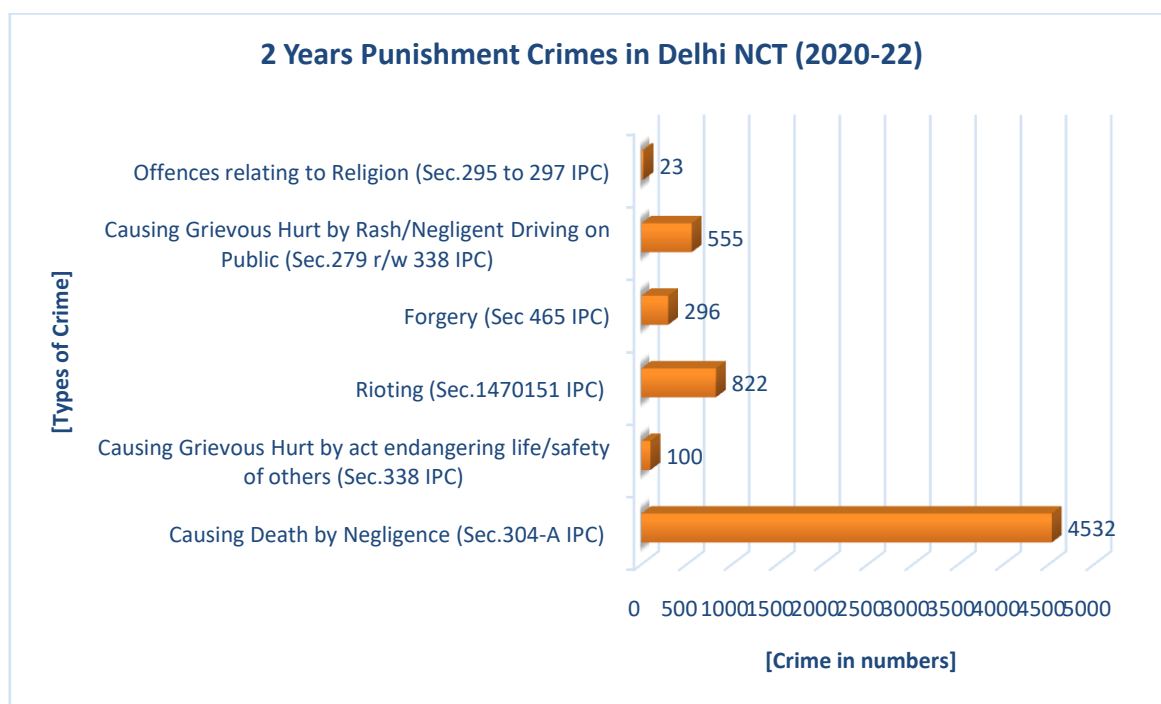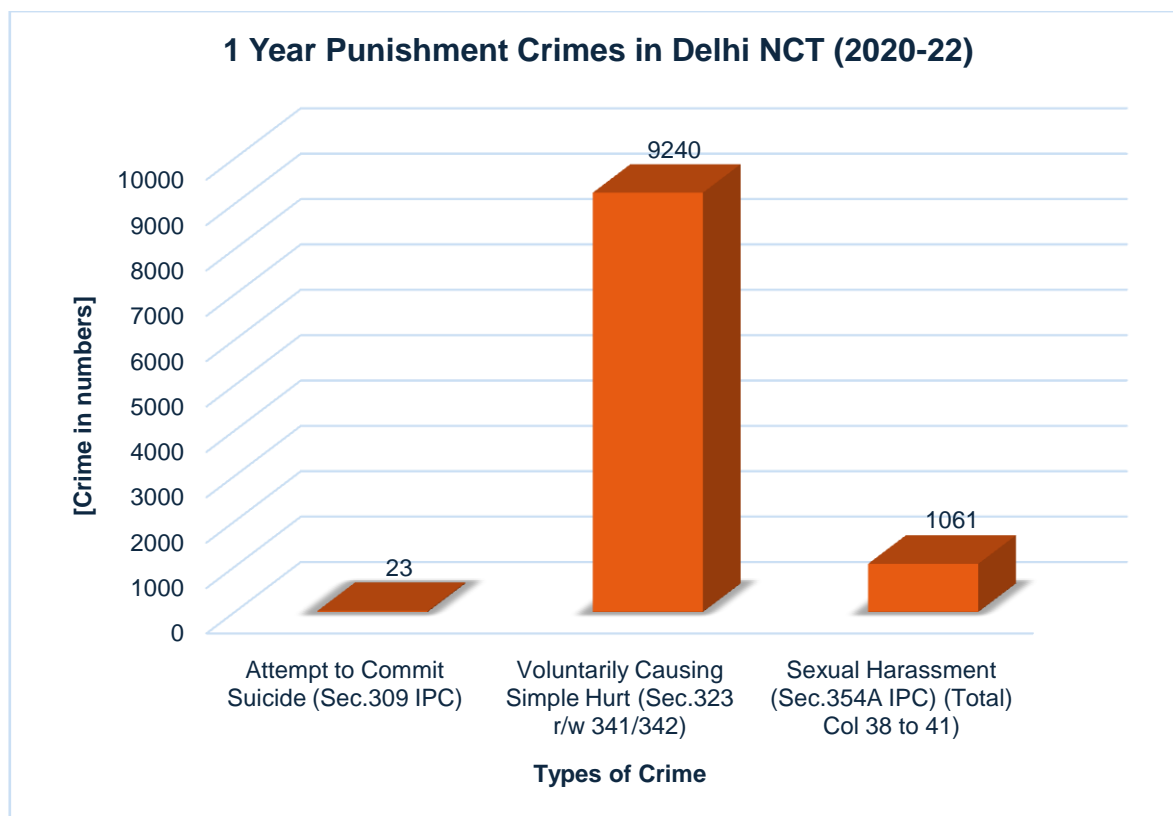

Figure 12: Two Years Punishment Crimes in Delhi NCT (2020-22)
Source: Crime in India, National Crime in India 2020, 2021 & 2022, National RecordsBureau, Ministry of Home Affairs,GOI.

Crimes voluntarily causing Simple Harm under the 1-year punishment class were high, recording a 9240-case number between 2020 and 22. These cases were mostly reported from the North East (1175 cases) district, whereas the other remaining districts registered cases below 1000. Illiterates (r=.929) and non-workers (r=.903) represented a strong positive relationship. 86% illiterates and 81% non-workers explained the variance of crime as determined by R^2.

Crime Sexual Harassment registered 1061 cases (figure 13), most from the Dwarka Police district. It has occurred chiefly at Work or Office Premises (51 cases), in Public Transport Systems (11 cases), in Shelter Homes for Women and Children (1 case) and in Other Places (998 cases). Literates and workers (r=.810 each) and non-workers (r=.801) have a positive relationship known by their r value. Sixty-five per cent of each variance of sexual harassment is explained by literates and workers and 64 per cent by non-workers. A total of 23 cases of Attempts to Commit Suicide were recorded, and district New Delhi contributed the most. Crimes under the One Year Punishment class were primarily reported from North East, Dwarka and New Delhi districts.

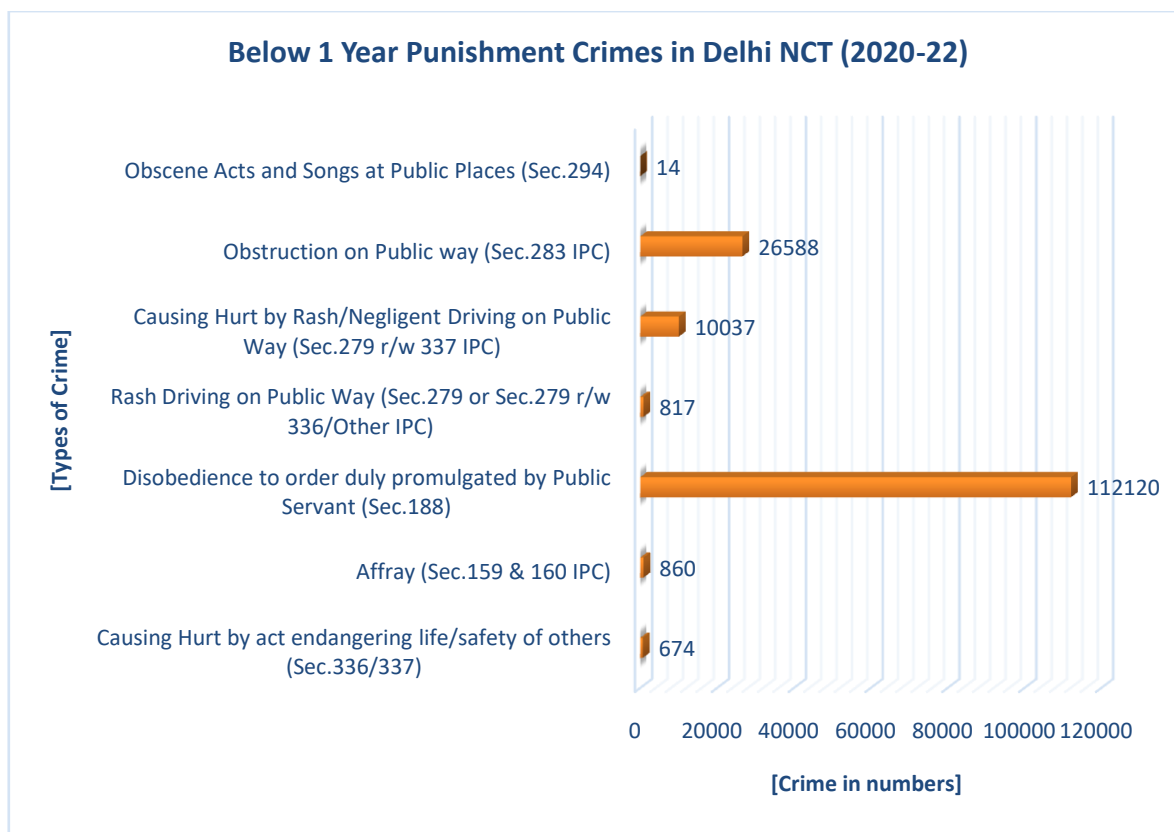**Figure 13:** One-Year Punishment Crimes in Delhi NCT (2020-22)
Source: Crime in India, National Crime in India 2020, 2021 &2022, NationalRecordsBureau, Ministry of Home Affairs,GOI.

Crime under the below 1 Year Punishment class occurred mostly due to Disobedience to orders duly promulgated by the Public Servant between 2020 and 22. Two districts, North West (13858 cases) and Outer (12344 cases), reported cases above 12000. A total of 112120 cases were registered. This crime has a bearing on illiterates (r=.942), non-workers (r=.932), the SC population (r=.926), literates (r=.920), and workers (r=.917) expressed by their r values (Table 1).

Another highly occurring crime is Obstruction of Public Way, which recorded 26588 cases. Out of the total, two districts, Central (4883 cases) and Outer (4419 cases), recorded cases above 4000. This crime has a poor relationship with explained factors like workers (r=.240), literates (r=.215), non-workers (r=.181), illiterates (r=.156), and the SC population (r=.145), but it is highly influenced by unexplained factors.

Crime Causing Hurt by Rash/Negligent Driving on Public Way (10037 cases) was reported mainly from the South East (1033 cases) district. Workers (r=.927), literates (r=.917) and non-workers (r=.904) possessed a strong positive relationship. A total 817 number of cases of Rash Driving on the Public Way were reported, and the highest contribution of 129 cases was from South West district. The variance of this crime is mostly due to unexplained factors rather than explained factors, such as workers (r=.689), literates (r=.673), and non-workers (r=.628).

Eight hundred sixty crime cases were registered in Affray, and the maximum was reported from the Southeast (193 instances) district. Causing harm by act endangering the life/safety of others reported 674 cases and the highest contribution was from the Outer (108 cases) district. The crime Obscene Acts and Songs at Public Places recorded 14 cases (figure: 14), of which the highest case was reported from the New Delhi (6 cases) district. The analysis shows that the North West, Outer,Central,South East, and New Delhi districts recorded the highest number of crimes under the Below 1 Year Punishment class.

Figure 14: Below One Year Punishment Crimes in Delhi NCT (2020-22)
Source: Crime in India, National Crime in India 2020, 2021 & 2022,National Records Bureau, Ministry of Home Affairs, GOI.

5. CONCLUSION

From the analysis of crime headwise falling under different punishment classes, it was found that the crimes Attempting to Commit Murder and Murder under the death Punishment class were very high. Crimes like Robbery and Rape under Life Punishment class registered very high and high. Under the 10 Years Punishment class, the number of burglaries recorded was very high. Kidnapping and abduction crimes were at the top under the 7 Years Punishment class, followed by the crime of Cheating. Assault on Women's crime under the 5 Years of Punishment class was very high. Crime Theft was very high in the 3 Years Punishment class. Causing death by negligence crime was the most common crime under the 2 Years Punishment class. Voluntarily causing simple hurt crime under the 1 Year Punishment class was very high, and under the Up-to-1 Year Punishment class, the crime of disobedience to order duly promulgated by public servants occurred the most. Among the 15 Police Districts of Delhi NCT, it is identified that in Dwarka, the highest number of incidences were registered, followed by North East and South East Police districts. These districts also registered the maximum types of crime. Thus, it is noted that the Police districts like Dwarka in the western part, the East in the Northern part and the East in the southeastern part are highly crime-prone areas of Delhi NCT. It is further evidenced from the correlation table that these crimes have a strong positive bearing upon illiterates (r=.972), non-workers (r=.969), literates (r=.959), workers (r=.954) and SC population (r=.939). Their spatial variation is due to the socio-economic and physical characteristics of an area, which is also supported by findings of Ennis 1967, stating that regional variations in crime may be attributed to various factors such as community types, population demographics, police practices, and even the pervasive yet enigmatic cultural atmospheres (Ennis, 1967).

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