STATISTICAL ANALYSIS OF CRIMINAL OFFENCES IN NKANU WEST LOCAL GOVERNMENT AREA IN ENUGU STATE, NIGERIA FROM 2007 – 2015

Ozofor, Ndidiamaka M. (Phd)

Department of Computer Science & Mathematics,
Godfrey Okoye University Enugu, Nigeria

Benson, Ikenna D.

Department of Computer Science & Mathematics,
Godfrey Okoye University Enugu, Nigeria

Abstract
Criminal offences recorded in Nkanu West Local Government Area from 2007 to 2015 were analysed using statistical tools. The records obtained from the Police Headquarters in the Local Government Area, were used to study the causes of crime, the pattern of criminality, the link between these crimes with gender and age, to make prediction for future and proffer solutions to the prevalent crimes recorded. Statistical tools like Analysis of Variance (ANOVA), Regression and minitab statistical software were employed. Results show that there is no significant difference between age/gender and five most committed crimes in Nkanu West L.G.A using the 95% confidence interval. The study also shows that crime rate is expected to reduce as the years go by.

Keywords: Crime, Murder, House breaking, Unlawful Possession of Arms, Rape, Grievous Harm, Attempted Murder, Hard Drugs Possession.

1.   Introduction

A crime (criminal offence) is an act harmful, not only to some individuals but also to a community, society or the state. Such acts are forbidden and punishable by law (Wikipedia, 15-01-18). It can also mean an act committed in violation of the law where the consequences of conviction by a court are punishments especially where the punishment is a serious one such as imprisonment. Examples of criminal offences in societies are cybercrimes (website cloning, financial fraud, identity theft, credit card theft, cyber harassment, fraudulent

electronic mails, cyber laundering), economic crime (pipeline vandalism, illegal oil bunkering, tax evasion etc.), financial crime (bank fraud, issuance of dud cheques etc.), advanced fee fraud, money laundering, terrorism, rape, forgery, police brutality and hostility, bribery and corruption, armed robbery, human trafficking, assassination etc.

There is no society without a form of criminal offence or another. What differs is the nature of offence(s) prevalent, the extent of damage done to the society by these acts, the efforts/measures put in place to combat such crimes, the causes/factors promoting these crimes and the effects of these criminal offences on the population. Nigeria being the most populous black nation is not an exception to this trend. With the high rate of unemployment, harsh economic conditions, high illiteracy level, political instability, corruption in governance, poverty, irresponsible parenting and a sharp drift/ decline in morality due to fast technological advancements, she has not escaped a proportionate share of crimes of different kinds. Akparanta (1994) attempted to provide reasons for urban violence/ crime in post civil war Nigeria, arguing that following the war, these was an abundance of guns in private hands and times were hard economically. Accompanied by deterioration in the standard of education, and the lack of specific training in areas relevant for sustaining both the agricultural and the industrial sector, many youths went astray. Osalar (2009) opined that "the scariest undertone of Nigeria's socio-economic underachievement, by far, is the steady rise in youth crime, nurtured in a climate of increasing national income and the simultaneous failure of employment-generation and poverty alleviation progammes".

This study was conducted in Nkanu West L.G.A. in Enugu State Southeast Nigeria. The area plays host to the state university and other tertiary institutions. Nkanu people are predominantly farmers and traders. The area is approximately between Lat $60^o30^/$ north and longitude $70^o30^/$ east. It has an area of about 225km^2 with a population of 146695 (according to 2006 census). The headquarter of Nkanu L.G.A. is in Agbani town, other major towns are Akegbe, Ozalla, Umunze, Amodu, Obe, Akpugo, Amuri, Obuofia.

The research covered the total number of reported criminal cases in Nkanu West Local Government Area for the period of 2007 to 2015. The data was collected from the police headquarters Agbani covering a period of nine years. The criminal offences reported are the violent and property crimes – murder, automobile theft, burglary of store, house breaking, unlawful possession of arms, rape, grievous harm, attempted murder, hard drugs, possession and motor cycle theft. The study hinges on the causes and motivations for crime, most

prevalent forms of crime in the local government and the trend pattern over the period under study which would be helpful in making prediction for future occurrences of similar offences.

2.   Methodology

The survey research method was adopted for the work. Survey research can also be called descriptive research. It is based on information gathered through questionnaires, interviews (oral, written, structured or unstructured), and inventories, rating scales, self-reports and observations

For the study, research hypothesis were used. The research questions were as follows:

HQ_1: There are no significant differences among various forms of crime committed in Nkanu West Local Government Area.

HQ_2: There is no significant difference in the age related criminal offences in Nkanu West Local Government Area.

HQ_3: There is no significant difference in the gender related criminal offences in Nkanu West Local Government. The methods of analysis adopted in the study were Analysis of Variance (ANOVA) and Regression Analysis. Analysis of Variance (ANOVA) was used to answer some of the research questions as well as determine the hypothesis set for the study of the most prevalent crimes in Nkanu West L.G.A and if the rate of crime is age related and gender related. Regression analysis was used to determine the actual trend on crime in Nkanu West over the years ahead. The simple linear regression model is given as $y = a + bx$ and the computational formula for the regression parameters a and b are given by

$$b = \frac{\left(n\sum xy - \sum x \sum y\right)}{n\sum x^2 - \left(\sum x\right)^2}$$

$a = y - bx$ Where n is the sample size and y and x are the mean of the y and x values respectively.

For forecasting, the linear regression model will be used to obtain future values. All the analyses were done using statistical package minitab.

The data on various crimes committed within the local government for the period under study, as collected from the record unit of the planning, research and statistics department of the Police Headquarters, Agbani are summarized below

Table 1.1: Reported Cases of Crime from 2007 to 2015

Year	Murder	Automobile theft	Burglary of Store	House Breaking	Unlawful Possession of Arms	Rape	Grievous Harm	Attempted Murder	Hard Drugs Possession	Motorcycle Theft	Total
2007	6	10	22	30	7	15	24	14	10	15	**153**
2008	7	8	15	20	11	14	15	12	18	10	**130**
2009	3	5	9	16	8	18	10	10	10	9	**98**
2010	2	4	10	20	9	11	24	10	12	13	**115**
2011	3	5	11	21	7	10	17	7	11	6	**98**
2012	2	5	6	15	8	16	20	2	11	14	**99**
2013	4	3	14	30	9	21	12	1	10	4	**108**
2014	4	4	9	26	10	10	17	4	13	9	**106**
2015	5	1	8	30	12	7	21	10	18	16	**128**
Total	**36**	**45**	**104**	**208**	**81**	**122**	**160**	**70**	**113**	**96**	**1035**

Source: Police Headquarters, Agbani

Table 1.2: Summary of Reported Cases against Year

S/N	Year	Total Reported Cases	Average
1	2007	153	15.3
2	2008	130	13.9
3	2009	98	9.8
4	2010	115	11.5
5	2011	98	9.8
6	2012	99	9.9
7	2013	108	10.8
8	2014	106	10.6
9	2015	128	12.8
Total		**1035**	**103.5**

Source: Police Headquarter, Agbani

3. Discussions/ Analysis

From table 1.1, it is found that a total 1035 cases were reported for the period under study. The most reported cases are house breaking (208), grievous harm (160), rape (122) and hard drugs possession (113). While the least reported cases are murder, automobile theft, attempted murder, unlawful possession of arms and motorcycle theft. Also from table 1.2, 2007 had the highest number of reported cases (153), followed by 2009 (130), 2015 (128) and 2010 (115). This wouldn't come as a surprise since 2007 was an election year where the majority of the people were immersed or exposed to all forms of unfair electioneering processes considering the fact that election in Nigeria is "do or die" affair. Such periods would also increase the recruitment of able-bodied youths as thugs. It is important to note that

these thugs were armed to the teeth and would resort to crime when not fully engaged in political or other meaningful activities.

In order to achieve the aims of the study and test the hypothesis set out in this study, various statistical methodologies were applied via computer analysis using the minitab statistical package. Test of significance of 95% confidence interval was used.

Test of Hypothesis I

H_0: There is no significant difference between age and five most committed crimes in Nkanu West Local Government Area.

H_1: There is significant difference between age and five most committed crime in Nkanu West Local Government Area. *(See Appendix 1 for Data Table)*

Table 1.3: ANOVA Table for One Way Classification

Source	df	Ss	Ms	F_{Cal}	F_α
Treatment	4	920.395	230.1	0.47	2.641
Error	35	17168.405	470.53		
Total	**39**	**18088.800**			

$$F_{cal} < F_\alpha$$

Decision Rule

Since $F_{cal} = 0.47 < F_\alpha = 2.641$ under 95% confidence interval, so we reject H_0 and conclude that there is no significant difference between age and five most committed crimes in Nkanu West Local Government Area.

Test of Hypothesis II

H_0: There is no significant difference between gender and five most committed crimes in Nkanu West Local Government Area.

H_1: There is significant difference between gender and five most committed crimes in Nkanu West Local Government Area.

(See Appendix II for Data Table

Table 1.4: ANOVA Table for One Way Classification

Source	df	Ss	Ms	F_{Cal}	F_α
Treatment	4	3681.6	920.4	0.0916	5.192
Error	5	50242.5	10048.5		
Total	**9**	**53924.1**			

$$F_{cal} < F_\alpha$$

Decision Rule

Since $F_{cal} = 0.0916 < F_\alpha = 5.192$ under 95% confidence interval, we reject H_0 and conclude that there is no significant difference between gender and five most committed crimes in Nkanu West Local Government Area.

Trend Estimation and Predicting

On trend estimation and formulation of the prediction model, the simple linear regression analysis was carried out using data in table, see appendix III.

$y = 110.4 - 2.77x$

The negative sign of $a = -2.77$ indicates decline instead of increase and justifies the acceptance of the null hypothesis, H_0, there are no significant increase in the trend for crime as the year progresses.

Therefore the following trend estimate was calculated;

S/N (x)	Year	Total (y)	Trend Estimate (YC)
1	2007	153	107.63
2	2008	130	104.86
3	2009	98	102.09
4	2010	115	99.32
5	2011	98	96.55
6	2012	99	93.76
7	2013	108	91.01
8	2014	106	88.24
9	2015	128	85.47

Prediction Table

10	2016	*	82.70
11	2017	*	79.93
12	2018	*	77.16

From the estimated trend, the forecast and the graph as shown, the trend is decreasing at the rate of 2.77 percent. This implies that crime rate is expected to reduce as the years go by.

The forecast made for the average crime rate in the state for 2016, 2017, and 2018 are as follows: 82.70, 79.93 and 77.16 respectively.

4. Conclusion and Recommendation

Crime retards the development of any community while criminals act as opposition to the progress of any institution. The criminal report in Nkanu West Local Government Area is evidence that the community is for from secure. The factors influencing these crimes are not

very different from those affecting other areas or parts of the country. While the study shows a yearly analysis of crime rate in the area, it also highlights the weaknesses of the law enforcement agencies in combating these crimes. The study also informs individuals, groups and the society at large of the need to be sensitive and security conscious. The following measures are recommended to foster a "less criminal infected" society:

- revamping the education system to coincide with local imperatives especially with regards to vocational training and skill development,

- enforcing creative poverty alleviation schemes that promote rapid enterprise development in both urban and rural areas,

- Government should fight institutional corruption and bureaucratic decadence in government agencies for effective policy implementation,

- Non-governmental organisations should assist in rehabilitating criminal elements by equipping them with practical skills on how to cope with life,

- Creation of jobs and job opportunities for the ever increasing graduates of tertiary institutions,

- Enforcement of strict penalties for criminal offences that have become the order of the day.

- Equipping law enforcement agencies to enable them discharge their duties effectively

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Table 1: A one way analysis of variance (ANOVA); Picking from the five most committed crimes

	1	2	3	4	5		
	Age crime	House breaking	Grievous harm	Rape	Hard drugs possession	Burglary of store	Y.j Total
A	18-22	24	10	29	25	9	97
B	23-27	90	80	39	40	30	279
C	28-32	68	20	25	31	36	180
D	33-37	18	11	21	10	20	80
E	38-42	7	14	5	4	5	35
F	43-47	1	9	2	2	3	17
G	48-52	0	10	1	1	1	13
H	53+	0	6	0	0	0	6
yi.	total	208	160	122	113	104	707

$$Yij = \mu + \tau i + \varepsilon ij$$

$$\text{SST} = \sum\sum yij^2 - \frac{y..^2}{kn} \implies 18088.8 \ .$$

$$\text{SStrt} = \frac{1}{n}\sum_{i=1}^{k} yi.^2 - \frac{yi.^2}{kn} \implies 920.395 \ .$$

$$\text{SSE} = \text{SST} - \text{SStrt} \implies 17168.405 \ .$$

APPENDIX II

A one way analysis of variance (ANOVA) Picking from the five most committed crimes from *table:*

gender crimes	1 House breaking	2 Grievous harm	3 Rape	4 Hard drugs possession	5 Burglary of stores	y.j	%
M	207	155	122	110	100	**694**	98.2
F	1	5	0	3	4	**13**	1.8
Yi. Total	208	160	122	113	104	**707**	

$$Yij = \mu + \tau i + \varepsilon ij$$

$$SST = \sum\sum yij^2 - \frac{y..^2}{kn} \implies 53924.1 .$$

$$SStrt = \frac{1}{n}\sum_{i=1}^{k} yi.^2 - \frac{yi.^2}{kn} \implies 3681.6 .$$

$$SSE = SST - SStrt \implies 50242.5 .$$

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APPENDIX III

Y=a+bx

S/n (x)	Year	Total (y)	X²	XY
1	2007	153	1	153
2	2008	130	4	260
3	2009	98	9	294
4	2010	115	16	460
5	2011	98	25	492
6	2012	99	36	594
7	2013	108	49	756
8	2014	106	64	848
9	2015	128	81	1152
45		1035	285	5009

n = 9

$$b = \frac{n\Sigma xy - \Sigma x \, \Sigma y}{n\Sigma x^2 - (\Sigma x)^2}$$

b => -2.77

a = Y - bX

where; $y = \frac{\Sigma y}{n}$, $x = \frac{\Sigma x}{n}$

a => 110.4

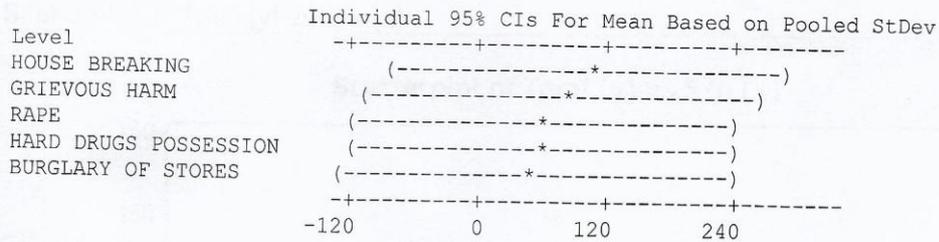Y = a + bx

Welcome to Minitab, press F1 for help.

One-way ANOVA: HOUSE BREAKI, GRIEVOUS HAR, RAPE, HARD DRUGS P, BURGLARY OF

```
Source   DF    SS      MS     F      P
Factor    4   3682    920   0.09  0.981
Error     5  50243  10049
Total     9  53924
```

S = 100.2   R-Sq = 6.83%   R-Sq(adj) = 0.00%

```
Level                      N   Mean   StDev
HOUSE BREAKING             2  104.0   145.7
GRIEVOUS HARM              2   80.0   106.1
RAPE                       2   61.0    86.3
HARD DRUGS POSSESSION      2   56.5    75.7
BURGLARY OF STORES         2   52.0    67.9
```

```
                       Individual 95% CIs For Mean Based on Pooled StDev
Level                    -+---------+---------+---------+--------
HOUSE BREAKING               (--------------*--------------)
GRIEVOUS HARM             (--------------*--------------)
RAPE                       (-------------*--------------)
HARD DRUGS POSSESSION      (-------------*--------------)
BURGLARY OF STORES         (-------------*--------------)
                         -+---------+---------+---------+--------
                       -120        0       120       240
```

Pooled StDev = 100.2

Regression Analysis: Total (y) versus S/n (x)

```
The regression equation is
Total (y) = 129 - 2.80 S/n (x)


Predictor     Coef   SE Coef       T       P
Constant    129.00     13.26    9.73   0.000
S/n (x)     -2.800     2.356   -1.19   0.273


S = 18.2506    R-Sq = 16.8%    R-Sq(adj) = 4.9%


Analysis of Variance

Source          DF      SS      MS      F       P
Regression       1   470.4   470.4   1.41   0.273
Residual Error   7  2331.6   333.1
Total            8  2802.0
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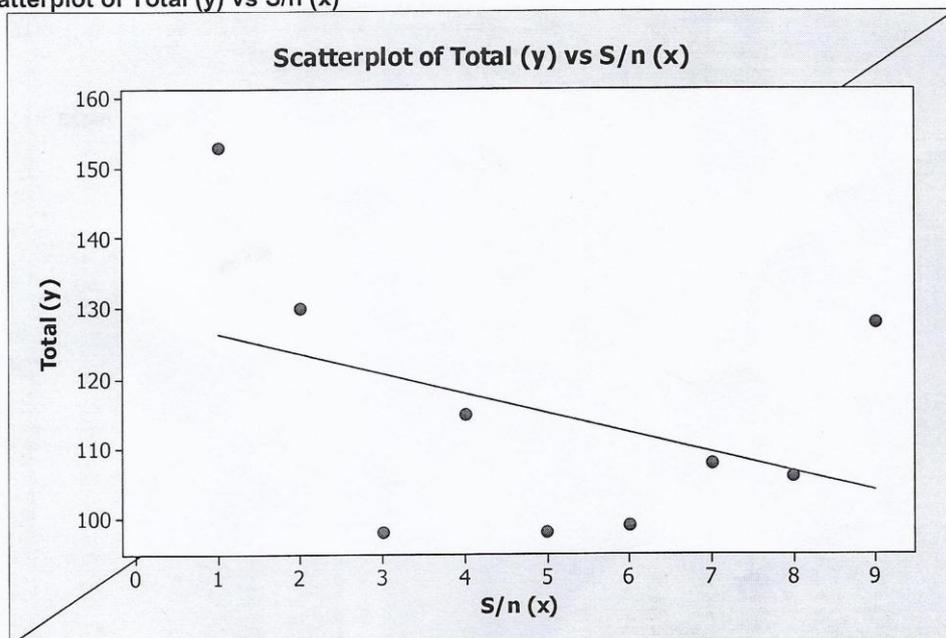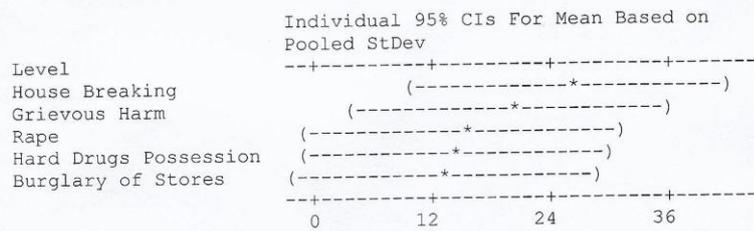
Scatterplot of Total (y) vs S/n (x)

Scatterplot of Total (y) vs S/n (x)

One-way ANOVA: House Breaki, Grievous Har, Rape, Hard Drugs P, Burglary of

```
Source  DF     SS    MS     F      P
Factor   4    920   230  0.47  0.758
Error   35  17168   491
Total   39  18089

S = 22.15   R-Sq = 5.09%   R-Sq(adj) = 0.00%
```

```
Level                    N   Mean   StDev
House Breaking           8  26.00   34.36
Grievous Harm            8  20.00   24.59
Rape                     8  15.25   15.11
Hard Drugs Possession    8  14.13   15.63
Burglary of Stores       8  13.00   13.94

                         Individual 95% CIs For Mean Based on
                         Pooled StDev
Level                    --+---------+---------+---------+-------
House Breaking                    (-------------*-----------)
Grievous Harm                 (-------------*-----------)
Rape                       (-------------*-----------)
Hard Drugs Possession      (-----------*-----------)
Burglary of Stores        (-----------*-----------)
                         --+---------+---------+---------+-------
                           0        12        24        36

Pooled StDev = 22.15
```