Modelling Deaths from Road Traffic Accidents in Lagos State, Nigeria

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Abstract

Using mostly secondary data on vehicular accidents obtained from the Nigeria Police Force and Federal Road Safety Commission, the study examines reported deaths from road traffic accident in Lagos State, Nigeria (1970-2001). The variance spectra for Ikorodu, Ajeromi/Ifelodun, Lagos Island, Lagos Mainland, Ikeja, Epe and Badagry Local Government Ares shows no regularity in the occurrence of deaths from road traffic accident variation in the long period of accident occurrence of Lagos State are composed of different cycles. This means that 90% of deaths from (RTA's) could be attributed to recklessness on the part of drivers, ignorance of highway codes etc. The reported numbers of deaths from road traffic accidents in the 20 Local Government Areas of Lagos State were compared using Analysis of Variance (ANOVA). The result shows that for the 2 factors Local Government Areas and years, the calculated F-ratios of 19.62 and 9.72 respectively at 0.05 level of confidence were higher than the table F-ratios of 1.57 and 1.46 respectively at 0.05 level of probability, it then implies that the means for reported deaths from road traffic accidents for each of the two factors, Local Government Areas and years were significantly different. In order to ascertain the means that were significantly different, DNMRT (Duncan |New Multiple Range Test) was used for mean comparisons. Based on the findings, policy recommendations were proffered on how to reduce the ugly, incidence of road traffic deaths in Lagos State and Nigeria in general.

Keywords: Deaths; modelling; traffic; accidents; road; Lagos state; Nigeria.

1. Introduction

It is apparent that road accident is a complex phenomenon not only in terms of its diverse causes but also in the nature of its effects on lives and property. Apart from the humanitarian aspects of road safety the injuries and fatalities, which occur as a result of road accidents, have serious social and economic consequence, which has made prospective travellers to develop phobia for spatial interaction. This under normal circumstances would have prevented and nicked in the bud all business initiatives that would have taken place at location different from the location of business tycoons given the fear of the unknown in relation to likelihood of being involved in road traffic accidents. Road traffic accidents have physical, social, emotional and economic implications. The global economic cost of road traffic accident was estimated at $518 billion per year in 2003 with $100 billion of that occurring in poor developing countries (WHO, 2009). Nigeria loses about 80 billion naira annually to road accidents of all subjects that are involved in road traffic accidents in Nigeria, 29.1 percent suffer disability and 13.5 percent are unable to return to work (Labinjo et al, 2010; Atubi, 2012a).

Road traffic injuries are increasing worldwide with developing countries bearing the brunt of this scourge. It has been projected that road traffic injuries will be the second most common causes of disability – adjusted life year loss in developing countries by the year 2020 (Murray and Lopez, 1996; WHO, 1996). Road traffic accident resulted in the year 2002 alone in injury of more than 35 million people worldwide out of them 5 million became permanently disabled and 1.2 million died (Nasar, 2003). Indeed, a World Bank study has shown that the economic development of regions and nations is associated with an increase in the number of injuries and deaths from road traffic crashes (Kopits, et al, 2005). Road traffic accidents' statistics in Nigeria reveal a serious and growing problem with absolute fatality rate and casualty figures rising rapidly. In majority of developing countries, accident occurrence and related deaths are relative to either population or number of vehicles.

Ironically, in Nigeria, studies have indicated that better facilities in terms of good quality and standardized roads have been accompanied by increasing number of accidents (Onokala, 2009). This is totally contrary to the trends in countries where even the level of sophisticated road network and volume of vehicular traffic are much higher (Atubi, 2010a). In almost all countries in Africa, Asia and Latin America road traffic crashes have become one of the leading causes of death in older children and economically active adults between the ages 30 and 49 years (Murray et al, 1995; Ross et al 1991; Jacobs, et al, 2000 and Atubi, 2012g). Despite this burgeoning problem, little attention has been paid to road traffic injury prevention and treatment in most developing countries. Efforts to combat the problem of injuries have in most cases been hampered by paucity of funds and lack of relevant data. It is however, a fact that organised road safety research, adoption of cost effective accident reduction and prevention techniques and trauma care are associated with a decreased road traffic mortality and morbidity (Murray et al, 1996; Mock et al, 1998).

A study of road traffic accident trend in Nigeria between the period 1960 and 2001 revealed a sharp increase in fatal accident occurrence. Between 1960 and 1969, it was observed that over 18,000 deaths occurred as a result of road accident. By the third and fourth decades (1980-2001), this figure increased to about five times, that is, more than 116,022 deaths (Omojola, 2004; Atubi, 2006). The number of people killed in road accidents between 1990 and 2005 rose from 28,253 and the fatality rate remains constantly high (Atubi, 2009c). According to data from the Nigeria Federal Road safety Commission, the country has the highest rate of death from motor accident in Africa; leading 43 other nations in the number of deaths per 10,000 vehicle crashes (FRSC, 2006; Obinna, 2007, p. 35). Nigeria is followed by Ethiopia, Malawi, and Ghana with 219,183 and 178 deaths per 10,000 vehicles respectively. Road traffic accidents statistics in Nigeria reveal a serious and growing problem with absolute fatality rate and casualty figure rising rapidly.

2. Materials and Methods

The data used in this study were derived from secondary source. The secondary data includes records of road traffic accidents (RTA) characteristics, such as total number of accidents in Lagos State, total number of deaths from road traffic accidents in Lagos State for a period of 32 years (i.e. 1970-2001). This study covers the 20 Local Government Areas of Lagos State, but only eight (8) local government areas were considered for this particular analysis. This is because the eight local governments are relevant to the harmonic analysis behaviour. They were also selected based on available data as well as the nature of the study area because there were only eight local government areas with complete data from 1970-2001.

3. Discussion of Results/Findings

In an attempt to examine the temporal pattern of deaths from road traffic accidents in Lagos State, the time series and trend analysis of the accident statistics leading to death in respect of each of the selected local government areas where undertaken. The results of these analyses are shown in (Figure 1 and Table 1).

Table 1: 5 Year Moving Averages of Reported Deaths from Road Traffic Accidents in Selected Local Government Areas in Lagos State (1970 – 2001)

	LAGOS STATE	LAGOS ISLAND	IKORODU	AJEROMI/ IFELODUN	BADAGRY	EPE	IKEJA	MUSHIN	LAGOS MAINLAND
1	208.60	37.40	15.40	30.20	15.60	11.40	42.80	32.00	33.20
2	250.00	47.60	19.40	35.20	17.20	12.20	53.20	37.20	37.60
3	299.60	59.60	25.40	41.40	20.60	13.00	64.80	41.20	42.00
4	333.00	67.80	25.40	45.40	24.20	14.00	73.00	38.80	40.00
5	340.80	73.80	25.20	45.00	25.80	15.20	77.00	43.00	46.40
6	379.40	80.80	27.20	52.40	30.80	16.00	82.80	47.00	52.40
7	407.80	86.20	26.80	57.80	32.60	17.40	87.60	49.60	54.40
8	415.00	88.60	22.60	59.80	30.60	19.00	90.40	49.60	56.40
9	410.00	85.40	23.40	58.40	28.60	21.00	87.20	47.20	51.80
10	379.80	77.40	24.00	52.80	25.00	19.60	80.00	42.60	47.00
11	351.20	73.00	23.00	47.00	22.80	19.20	74.60	42.60	51.20
12	359.20	74.00	21.00	51.80	22.80	18.80	75.00	40.60	51.20
13	367.80	70.40	23.00	50.20	22.80	17.40	70.80	39.60	49.00
14	393.60	73.20	24.40	51.20	22.80	16.20	73.80	42.00	53.40
15	441.00	79.40	24.00	55.40	24.60	18.20	79.40	43.00	52.80
16	478.20	78.80	21.80	54.80	24.00	19.40	79.60	36.60	40.20
17	460.00	69.00	22.20	41.60	23.80	19.60	79.80	29.40	32.80
18	437.60	60.00	21.60	34.20	23.80	19.60	70.80	24.80	27.00
19	417.40	52.40	18.40	29.20	21.40	17.60	62.60	19.80	20.40
20	391.40	38.20	16.80	22.40	20.40	16.40	54.60	15.80	16.60
21	372.80	30.20	15.80	18.60	18.40	14.40	41.00	13.00	13.80
22	360.60	22.20	13.40	15.80	14.80	12.60	32.80	13.40	15.00
23	370.40	20.80	10.20	16.40	14.00	11.60	24.40	14.80	16.20
24	383.20	21.60	10.00	17.60	14.00	11.40	22.80	15.40	17.20
25	377.80	24.00	9.60	18.20	12.20	10.80	23.60	16.20	18.40
26	368.20	26.00	9.80	18.80	12.20	11.00	26.80	16.40	19.20
27	360.20	28.80	9.40	19.60	12.40	10.80	30.40	17.00	21.28
28	371.80	114.80	10.40	19.80	12.00	11.00	36.80	25.20	29.60

Source: Analysis of Data Collected

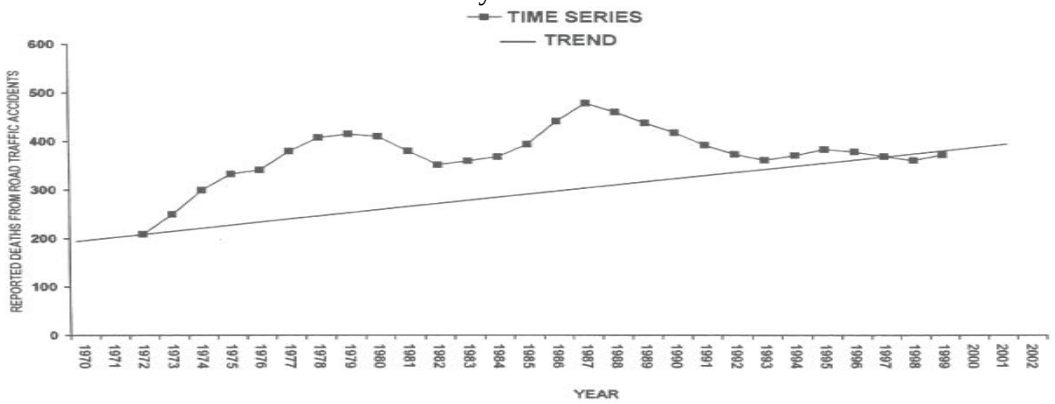

FIG. 1: Time Series and Trend of the Reported Deaths from Road Traffic Accidents in Lagos State (1970 – 2001)

Source: Adapted from table 1

This figure revealed the time series as well as trend of death from road traffic accidents for Lagos State. As shown in Fig. 1, the time series of death from road traffic accidents for Lagos State show variation over time. The year 1988 recorded the highest figure of 478 while the least was in 1972 with 209 deaths from road traffic accidents. The trend of death as shown in Fig. 1 reveals that the phenomenon is on the increase; in other words, the trend of deaths occurrence from road traffic accidents is on the increase in Lagos State between 1970 and 2001. Accidents were high during the years because of the fact that the federal road safety commission was not in existence then. As shown in (Fig. 2 and Table 1), the time series analyses for death from road traffic accidents in Lagos Island shows variation over time. The year 1979 recorded highest figure of 114 deaths while the least was in 1984 with deaths from road traffic accidents of 21. The trend of deaths from road traffic accidents as shown in figure 2 reveals that the phenomenon is on the increase, in other words, the trend of death is on the increase over the years. This show that death occurrences from road traffic accidents is on the increase in Lagos Island between 1970 and 2001 as revealed by the analysis. This could be as a result of high vehicular traffic that leaves and enters Lagos Island on a daily basis.

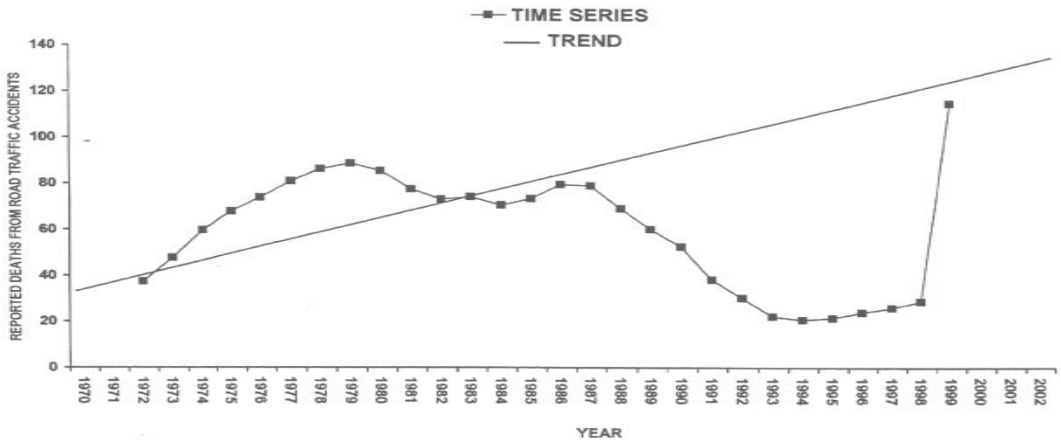

FIG. 2: Time Series and Trend of the Reported Deaths from Road Traffic Accidents in Lagos Island Local Government Area (1970 – 2001)

Source: Adapted from table 1

The time series analysis of deaths from road traffic accidents for Ikorodu Local Government reveal the least of 9 deaths from road traffic accidents in 1998 and highest figure of 27 in year 1977. The trend analysis however, show that the death occurrence is on the decrease in Ikorodu Local Government Area as the gradient is in downward direction (Fig. 3).

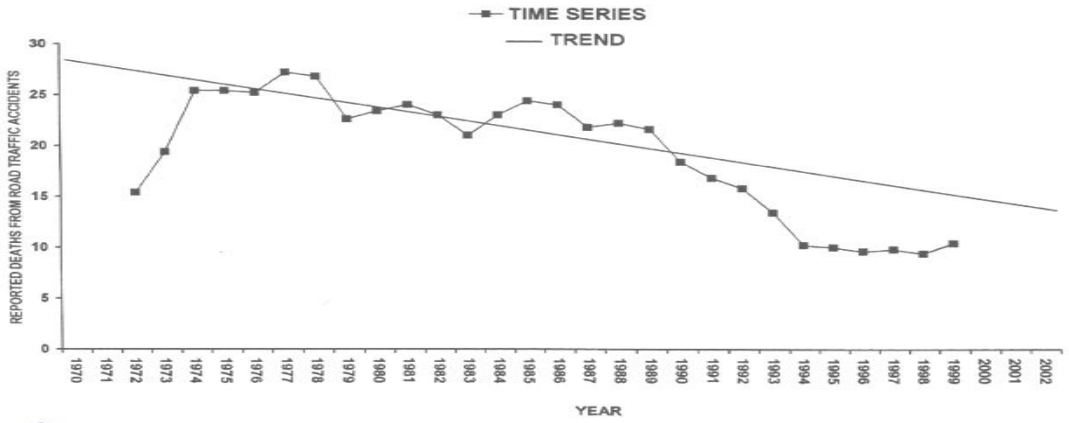

FIG. 3: Time Series and Trend of the Reported Deaths from Road Traffic Accidents in Ikorodu Local Government Area (1970 – 2001)

Source: Adapted from table 1

The time series of death from road traffic accidents for Ajeromi/Ifedun Local Government reveal the least figure 16 deaths from road traffic accidents in 1993 and highest figure of 60 in year 1979.

The trend analysis however, show the death occurrence from road traffic accidents is on the decrease as the gradient is in downward direction (Fig. 4). Death was high in 1979 because at that time Road Safety Commission was not in existence so people tend to be more reckless on the roads. While in 1993, it could be because of the very existence of Road Safety Commission hence the decreasing trend of deaths from road traffic accidents.

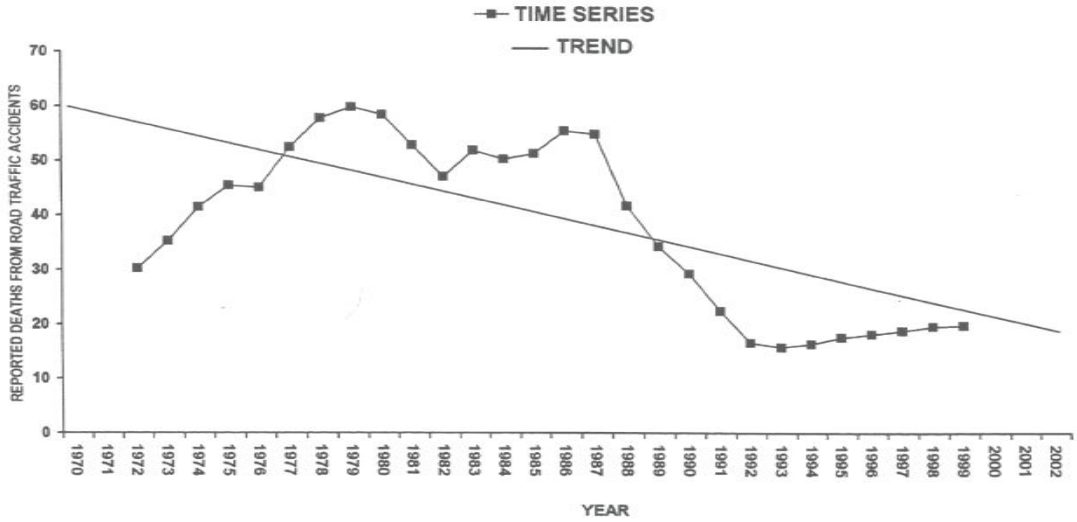

FIG. 4: TIME SERIES AND TREND OF THE REPORTED DEATHS FROM ROAD TRAFFIC ACCIDENTS IN AJEROMI/IFELODUN LOCAL GOVERNMENT AREA (1970 – 2001)

Source: Adapted from table 1

The time series of death from road traffic accidents for Badagry Local Government Area reveal the least of 12 deaths from road traffic accidents in 1999 and highest figure of 33 in year 1978. The trend analysis however, show that the death occurrence from road traffic accidents is on the decrease as the gradient is in downward direction (Fig. 5 and Table 1).

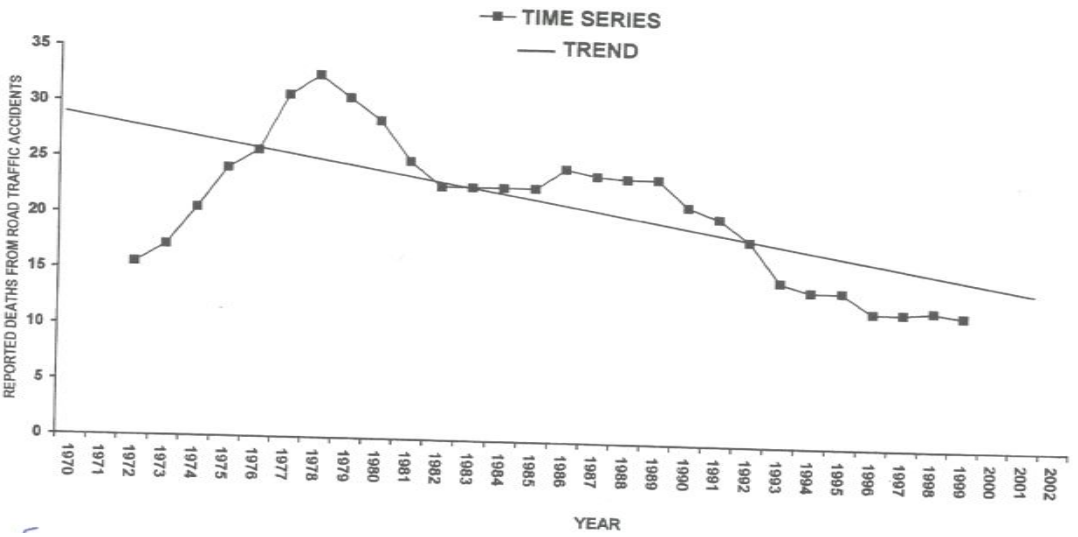

FIG. 5: TIME SERIES AND TREND OF THE REPORTED DEATHS FROM ROAD TRAFFIC ACCIDENTS IN BADAGREY LOCAL GOVERNMENT AREA (1970 – 2001)

Source: Adapted from table 1

For Epe Local Government, the series show highest death from road traffic accidents of 21 for 1980 and least figure of 11 for 1998. The trend as shown in figure 6, shows the phenomenon was on the decrease over the years (Fig. 6).

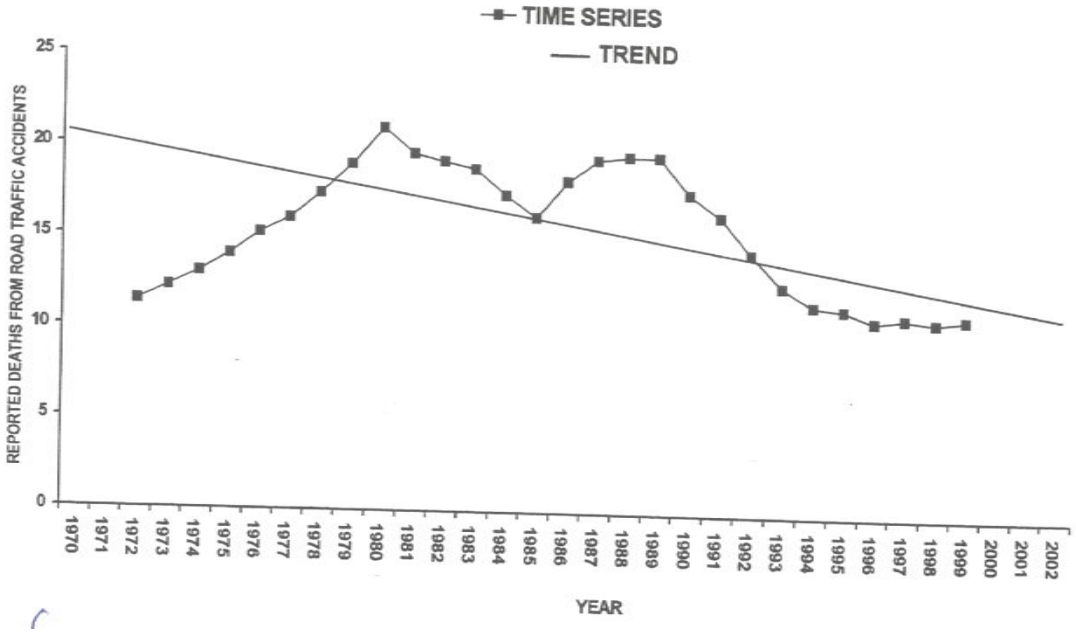

FIG. 6: TIME SERIES AND TREND OF THE REPORTED DEATHS FROM ROAD TRAFFIC ACCIDENTS IN EPE LOCAL GOVERNMENT AREA (1970 – 2001)

Source: Adapted from table 1

Mushin Local Government reveals the least figure of 13 deaths from road traffic accidents in 1992 and highest figure of 50 in year 1978. The trend analysis show that the death from accident occurrence is on the decrease as the gradient is in downward direction (Fig. 7).

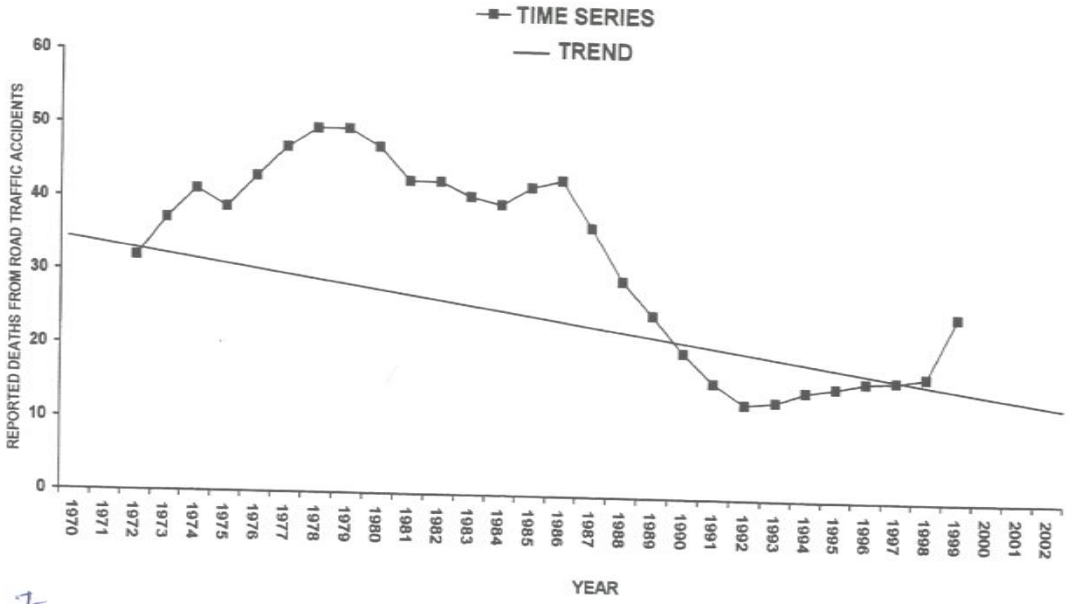

FIG. 7: TIME SERIES AND TREND OF THE REPORTED DEATHS FROM ROAD TRAFFIC ACCIDENTS IN MUSHIN LOCAL GOVERNMENT AREA (1970 – 2001)

Source: Adapted from table 1

Lagos Mainland Local Government reveals the least figure of 14 in 1997 and highest figure of 56 in year 1979. The analysis show that the death occurrence from road traffic accidents is on the decrease as the gradient is in downward direction (Fig. 8).

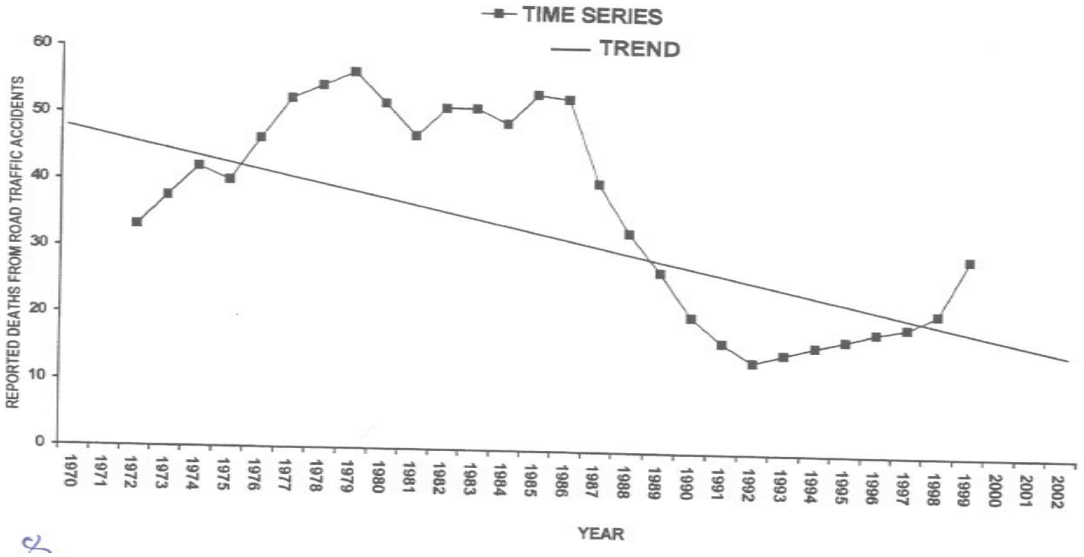

FIG. 8: TIME SERIES AND TREND OF THE REPORTED DEATHS FROM ROAD TRAFFIC ACCIDENTS IN LAGOS MAINLAND LOCAL GOVERNMENT AREA (1970 – 2001)

Source: Adapted from table 1

From the above discussions the time series analysis for death from road traffic accidents for each of the Local Government under study between 1970 and 2001 shows that deaths from road traffic accidents on the decrease with the exception of Lagos Island over the period of study.

Time series of deaths from road traffic accidents for Ikeja Local Government reveal the least figure of 23 deaths from road accidents in 1995 and highest figure of 90 in year 1979. The trend analysis however, shows that the death occurrence is in the decrease so the gradient is downward direction.

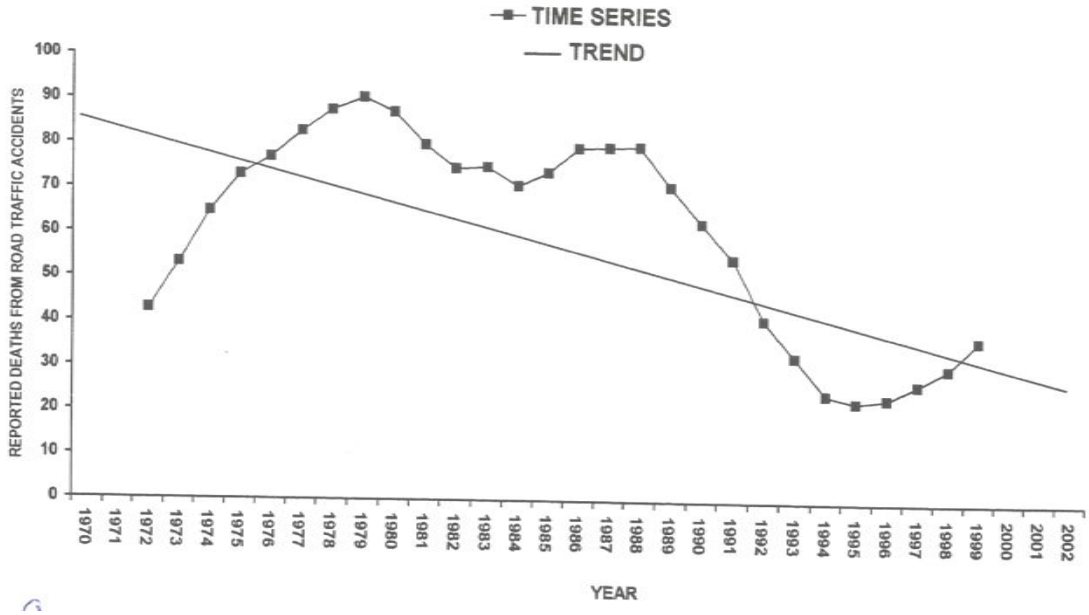

FIG. 9: TIME SERIES AND TREND OF THE REPORTED DEATHS FROM ROAD TRAFFIC ACCIDENTS IN IKEJA LOCAL GOVERNMENT AREA (1970 – 2001)

Source: Adapted from table 1

On the arithmetic mean reported number of deaths from road traffic accidents in Lagos State, generally the 1st harmonic contributes the highest percentage variance of 27.81%, closely followed by the 3rd and 8th harmonics contributing 22.15% and 9.57% of the total variance respectively (Table 2). The lowest percentage variance of 0.20% is contributed by the 7th harmonics. The 16 harmonics contribute 98.56% of the total variance in the time series.

Table 2: Variance spectra of reported number of deaths from Road Traffic Accidents

	Lagos		Lagos Island		Ikorodu		Ajeromi		Badagrey		Epe		Ikeja		Mushin		Lagos Mainland	
Harmonics	%V	Amp	%V	Amp	%V	Amp	%V	Amp	%V	Amp	%V	Amp	%V	Amp	%V	Amp	%V	Amp
1	27.81	73.50	4.36	22.37	50.27	8.20	57.26	21.78	50.21	8.10	59.03	5.00	58.75	29.98	53.21	16.92	47.14	19.10
2	3.77	27.05	5.59	25.32	6.42	2.93	0.11	0.95	7.51	3.13	0.45	0.44	0.25	1.97	1.55	2.39	4.12	5.65
3	22.15	65.59	7.48	29.31	3.49	2.16	4.87	6.35	9.41	3.51	7.30	1.76	12.39	13.77	1.23	2.58	4.43	3.33
4	1.63	17.78	5.05	24.08	1.35	1.34	3.30	5.23	1.78	1.52	7.27	1.75	0.15	1.53	4.83	5.1	5.28	6.39
5	7.56	38.33	5.31	24.68	0.83	1.05	6.08	7.10	2.95	1.96	3.00	1.15	3.56	7.33	1.06	2.39	1.58	3.50
6	9.35	42.62	8.71	31.62	9.15	3.50	4.59	6.16	7.53	3.13	2.20	0.96	4.28	8.09	5.71	5.54	5.92	6.30
7	0.20	6.21	4.30	23.48	0.67	0.94	2.53	7.62	1.50	1.40	0.97	0.64	0.16	1.59	2.10	3.36	1.19	3.03
8	9.57	43.12	9.17	3.44	6.09	2.86	4.92	6.38	1.15	1.25	4.15	1.33	3.55	7.33	5.81	5.59	6.44	7.06
9	1.18	15.11	5.55	2.24	10.32	3.90	0.39	1.79	0.57	0.66	150.00	0.30	0.17	1.64	1.54	2.88	1.55	3.47
10	3.40	25.63	7.77	29.37	1.25	1.28	2.42	4.48	0.21	0.52	0.80	0.58	1.04	3.98	4.65	5	5.32	6.41
11	0.40	8.36	5.23	24.02	2.57	1.85	3.14	5.10	9.53	3.53	3.67	1.25	0.90	2.15	4.91	5.14	7.6	7.67
12	0.51	9.97	5.51	25.15	0.19	0.51	0.15	1.11	0.61	0.39	2.80	1.09	0.36	2.35	1.81	3.12	6.88	2.61
13	1.95	19.44	4.21	21.08	1.89	1.58	4.74	6.27	0.27	0.59	0.23	0.32	3.65	7.47	5.09	5.23	6.32	6.99
14	3.88	27.46	8.38	31.01	0.04	0.23	1.18	3.12	1.12	1.21	1.71	0.85	1.35	5.32	0.45	1.55	6.66	2.26
15	1.84	10.92	6.55	27.42	1.72	1.52	0.49	2.01	0.71	0.96	1.57	0.83	0.57	2.97	0.78	2.06	0.23	1.35
16	3.36	25.56	6.32	26.94	0.19	0.50	1.33	3.38	0.36	0.69	0.04	0.13	0.35	2.31	0.00	0.06	0.01	0.31

% v = Percentage variance

Amp = Amplitude

Similarly, for Lagos Island, the 8th harmonic contributes the highest percentage variance of 9.17% closely followed by the 6th harmonic of 8.71% and the 14th harmonic which has 8.38% variance of the total variances observed. The 13th harmonic contributes the lowest percentage variance of 4.21% to the total variance of the time series. The total percentage of variance contributed by all 16 harmonics is 99.84%.

For Ikorodu Local Government Area, the 1st harmonic contributes the highest percentage variance of 50.27% and the 9th harmonic which has 10.82% variance of the total variance observed. This is closely followed by the 6th harmonic of 9.15%. Total percentage variance contributed by all 16 harmonic is 96.94%. The 14th harmonic contributes the lowest percentage variance of 0.04% of the total variance of the time series.

Similarly, the 1st harmonic accounts for the highest percentage variance of 57.27 for Ajeromi/Ifelodun Local Government Area, closely followed by the 3rd and 4th harmonic with percentage variances of 7.3% and 7.27% respectively. The 16th harmonic contributes the lowest percentage variance (0.04%). The 16 harmonics contribute a total of 96.8% to the temporal pattern of reported number of deaths from road traffic accidents occurrence.

For Ikeja Local Government Area, the 1st harmonic contributes the highest percentage variance of 58.75%, closely followed by the 3rd and 6th harmonics which contributes 12.39% and 4.28% of the variance respectively. The 4th harmonic contributes the lowest percentage variance of 0.15%. All 16 harmonics contribute a total of 91.38% of the variance in the temporal occurrence of reported number of deaths over the 32 years.

Similarly, the 1st harmonic account for the highest percentage variance of 53.21% for Mushin Local Government Area, closely followed by the 8th and 6th harmonics with percentage variances of 5.81% and 5.71% respectively. The 16 harmonics contributes the lowest percentage variance (0.01%). The 16 harmonics contributes a total of 94.74% to the temporal pattern of reported number of deaths from road traffic accident occurrence. For Lagos Mainland Local Government Area, the 1st harmonic contributes the highest percentage (47.14%) of the total variance, closely followed by the 11th and 8th harmonics which contributes 7.60% and 6.44% of the variance respectively. The 16th harmonic contributes the lowest percentage variance (0.01%). All 16 harmonics contribute a total of 94.87% of the variance in the temporal occurrence of reported number of deaths from road traffic accidents over the 32years. In other words, 94.87% of the reported numbers of deaths from road traffic accident variation in the long period of accident occurrence of Lagos State are composed of different cycles. This means that 94.87% of the reported number of deaths from road traffic accidents could be attributed to recklessness on the part of drivers, ignorance of highway codes, driving under the influence of alcohol, wrongful over taking, over speeding etc leaving 5.13% to other factors.

However, table 3 shows that for Lagos State as a whole, dominant cycles of reported number of deaths from road traffic accidents observed have periodicities of 32.00, 10.67 and 4.00 years with the most dominant being 32 years. This means that the dominant and strongest number of deaths from road traffic accidents pattern over Lagos State repeats itself every 32 years.

This also means that if the traffic situation is not given due attention by the relevant authorities high rates of reported number of deaths from road traffic accidents will repeat itself by the year 2033 in the first instance and the year 2017.

Table 3: Dominant Deaths from Road Traffic Accidents in Lagos State

Location	Cycles (years)	% Variance	Amplitudes
Lagos State 1st	32.00	27.81	73.50
2nd	10.67	32.15	65.59
3rd	4.00	9.57	43.12
Lagos Island 1st	4.00	9.17	32.44
2nd	5.33	8.71	31.62
3rd	2.29	8.38	31.01
Ikorodu 1st	32.00	50.27	8.20
2nd	3.56	10.82	3.80
3rd	5.33	9.15	3.50
Ajeromi/Ipelodun 1st	32.00	57.26	1.78
2nd	6.40	6.08	7.10
3rd	4.00	4.92	6.38
Badagry 1st	32.00	50.21	8.10
2nd	2.91	9.55	3.53
3rd	10.67	9.41	3.51
Epe 1st	32.00	59.03	5.00
2nd	10.67	7.30	1.76
3rd	8.00	7.27	1.75
Ikeja 1st	32.00	58.75	29.98
2nd	10.67	12.39	13.77
3rd	5.33	4.28	8.09
Mushin 1st	32.00	53.21	16.92
2nd	4.00	5.81	5.59
3rd	5.33	5.71	5.54
Lagos Mainland 1st	32.00	47.14	19.10
2nd	2.91	7.60	7.67
3rd	4.00	6.44	7.06

For Local Government areas such as Ikorodu, Ajeromi/Ifelodun, Badagry, Epe, Ikeja, Mushin and Lagos Mainland Local Government Areas, a dominant cycle of 32 years is observed. Variance spectra explaining the percentage variance explained by each harmonic have been drawn for the state as a whole as well as each Local Government Areas (Fig. 10 – 18).

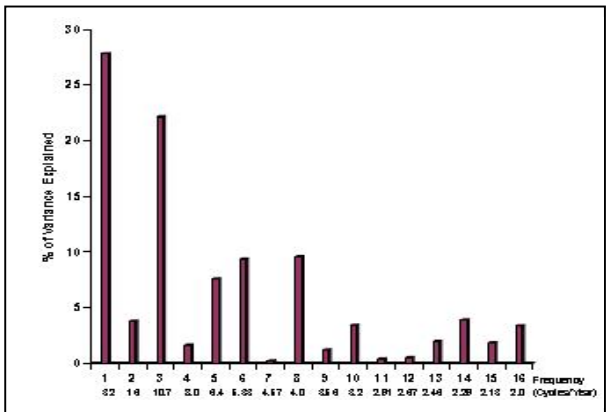

FIG. 10: VARIANCE SPECTRUM FOR LAGOS STATE ON THE NUMBER OF DEATHS FROM ROAD TRAFFIC ACCIDENTS

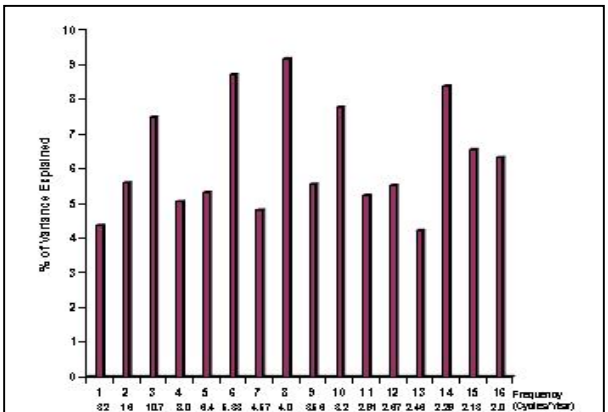

FIG. 11: VARIANCE SPECTRUM FOR LAGOS ISLAND LOCAL GOVERNMENT AREA ON THE NUMBER OF DEATHS FROM ROAD TRAFFIC ACCIDENTS

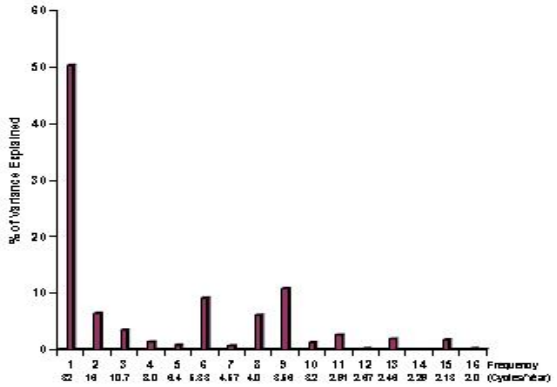

FIG. 12: VARIANCE SPECTRUM FOR IKORODU LOCAL GOVERNMENT AREA ON THE NUMBER OF DEATHS FROM ROAD TRAFFIC ACCIDENTS

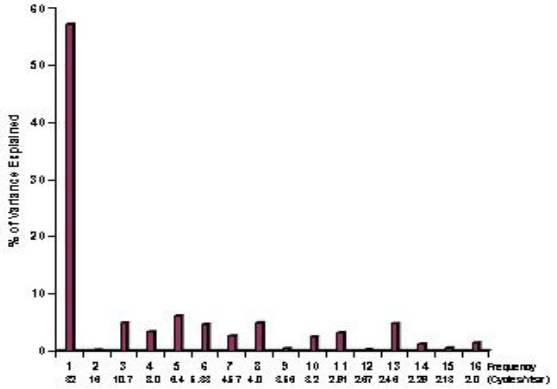

FIG. 13: VARIANCE SPECTRUM FOR AJEROMI OR IFELODUN LOCAL GOVERNMENT AREA ON THE NUMBER OF DEATHS FROM ROAD TRAFFIC ACCIDENTS

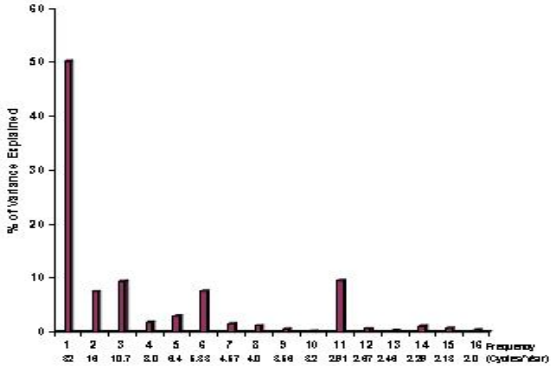

FIG. 14: VARIANCE SPECTRUM FOR BADAGRY LOCAL GOVERNMENT AREA ON THE NUMBER OF DEATHS FROM ROAD TRAFFIC ACCIDENTS

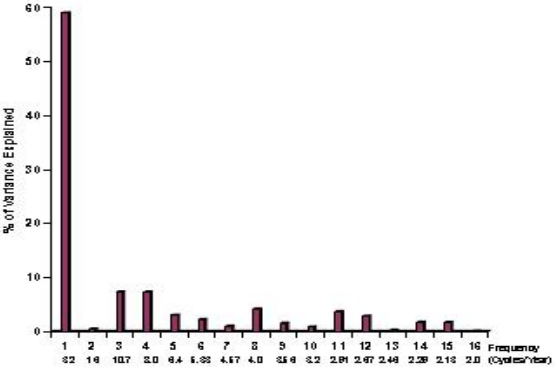

FIG. 15: VARIANCE SPECTRUM FOR EPE LOCAL GOVERNMENT AREA ON THE NUMBER OF DEATHS FROM ROAD TRAFFIC ACCIDENTS

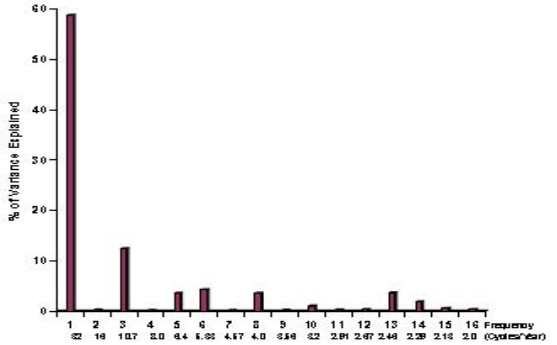

FIG. 16: VARIANCE SPECTRUM FOR IKEJA LOCAL GOVERNMENT AREA ON THE NUMBER OF DEATHS FROM ROAD TRAFFIC ACCIDENTS

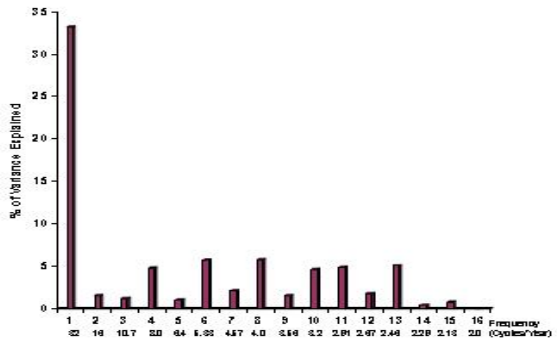

FIG. 17: VARIANCE SPECTRUM FOR MUSHIN LOCAL GOVERNMENT AREA ON THE NUMBER OF DEATHS FROM ROAD TRAFFIC ACCIDENTS

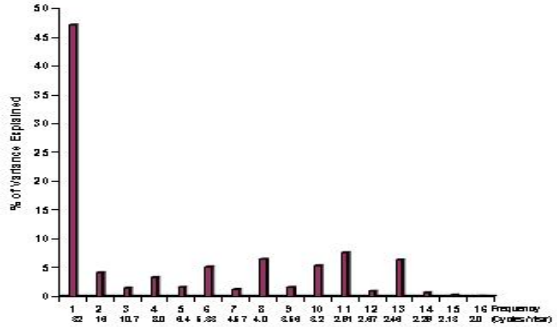

FIG. 18: VARIANCE SPECTRUM FOR LAGOS MAINLAND LOCAL GOVERNMENT AREA ON THE NUMBER OF DEATHS FROM ROAD TRAFFIC ACCIDENTS

An inspection of the power spectra for Ikorodu, Ajeromi/ifelodun, Badagry, Epe and Ikeja Local Government Areas (Fig. 12-16) shows no regularity in the occurrence of deaths from road traffic accident patterns, although 32years is the most dominant cycle. Also, an inspection of the power spectra for Lagos Island, Mushin and Lagos Mainland Local Government Areas (Figs. 11, 17, and 18) shows some regularity in the occurrence of deaths from road traffic accident patterns. The reported number of deaths from road traffic accidents in the twenty Local Government Areas of Lagos State from 1970-2001 were compared using analysis of variance (ANOVA). Two-one-way ANOVA, one for testing difference between the reported number of deaths from road traffic accidents across the twenty Local Government Areas and the other for testing difference between the reported deaths from road traffic accidents across different years, 1970 to 2001. The result shown by the ANOVA table for the mean comparisons are presented in table 4.

Table 4: Analysis of Variance for Reported Number of Deaths from Road Traffic Accidents in Lagos State.

Factor	Source of variation	Sum of squares	df	Mean squares	F.cal	F.table
Local Government Area	Between L.G.A	81412.48	19	4284.87	19.62	1.57
	Within L.G.A.	88227.27	404	218.38		
	Total	169639.75	423			
Years (1970 – 2001)	Between years	73716.03	31	2377.94	9.72	1.46
	Within years	95923.73	392	244.70		
	Total	169639.75	423			

The result shows that for the 2 factors, Local Government Areas and Years, the calculated F-ratios of 19.62 and 9.72 respectively at 0.05 level of confidence were higher than the table F-ratios of 1.57 and 1.46 respectively at 0.05 level of probability. Since the F-calculated were higher than F-table values at 0.05 level of probability, it then implies that the means for reported deaths from road traffic accidents for each of the two factors, Local Government Areas and years were significantly different. In order to ascertain the means that were significantly different, DNMRT was used for mean comparisons (see Appendix 1). The result for the mean comparisons for different Local Government Areas and that for different years (1970 – 2001) are shown in tables 5 and 6 respectively.

Table 5: Means of Reported deaths from Road Traffic Accidents in different L.G.A'S in Lagos State.

S/No	L.G.A	N	Means
1	Ikeja	32	57.03a
2	Lagos Island	32	52.91a
3	Ajeromi/Ifelodun	32	35.87b
4	Lagos Mainland	32	34.59bc
5	Mushin	32	30.44bcd
6	Apapa	16	27.13bcde
7	Oshodi/Isolo	16	24.19cdef
8	Surulere	16	23.81cdef
9	Ojo	13	21.69defg
10	Agege	13	21.54defg
11	Shomolu	16	21.31defg
12	Badagry	32	20.03defg
13	Ifako-Ijaye	13	18.69efgh
14	Ikorodu	32	18.38efgh
15	Alimosho	13	16.54efgh
16	Epe	32	14.88fgh
17	Ibeju-Lekki	13	13.85fgh
18	Kofofe	13	10.69gh
19	Eti-osa	13	10.62gh
20	Amuwo-odofin	13	8.08h

In table 5, the means were arranged from the highest mean to the lowest mean. The letters of alphabet indicated significant difference. Means with the same letter of alphabet attached to them are not significantly different while means that have a different letter of alphabet attached to them are significantly different. For example, from table 5, the means of reported number of deaths from road traffic accidents in Ikeja and Lagos Island are not significantly different or equal and significantly different from those in Ajeromi/Ifelodun, Lagos mainland, Mushin, and Apapa Local Government Areas which are not significantly different.

However, that of Ajeromi/Ifelodun is significantly different from that of Oshodi/Isolo Local Government Area is not significantly different from those of Lagos mainland, Mushin and Apapa Local Government Areas which were equal with that of Ajeromi/Ifelodun Local Government Area. The result suggests that although Kosofe and Agege Local Government Areas had the highest reported accident, the road traffic accidents were not serious as much more deaths were reported in Ikeja and Lagos Island Local Government Areas (Table 5, Fig 19, and Appendix 1).

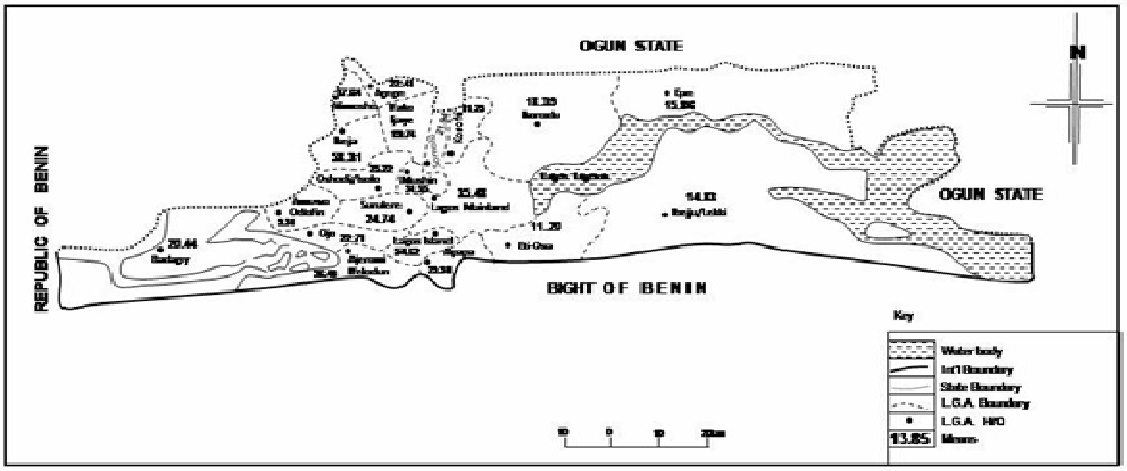

FIG. 19: MAP OF LAGOS STATE SHOWING L.G.A'S WITH DIFFERENT MEANS OF REPORTED DEATHS FROM R.T.A's

Source: Adopted from table 5

Table 6: Means of Reported Number of Deaths from Road Traffic Accidents 1970 – 2001

S/No	Years	N	Means
1	1985	8	65.38a
2	1980	8	60.38a
3	1979	8	60.38b
4	1978	8	54.88abc
5	1981	8	52.13abcd
6	1976	8	51.75abcde
7	1973	8	47.25bcde
8	1975	8	47.25bcdef
9	1988	12	42.63cdefg
10	1977	8	42.08cdefg
11	1986	12	40.25cdefg
12	1982	8	38.08defgh
13	1984	8	37.13defghi
14	1987	12	37.00defghi
15	1983	8	36.33efghij
16	1974	8	32.00fghijk
17	1989	20	30.75ghijk
18	2001	20	24.10hijk
19	1990	20	22.60ijk
20	1996	20	21.60jk
21	1997	20	19.70k
22	1994	20	19.45k
23	1972	8	19.45k
24	1993	20	19.38k
25	1995	20	18.65k
26	1998	20	17.55k
27	1991	20	17.25k
28	1999	20	17.05k
29	1970	8	16.75k
30	2000	20	16.55k
31	1992	20	16.25k
32	1971	8	16.25k

In table 6, the means were equally arranged from the highest down to the lowest. The letters of alphabet indicate significant difference. Means with the same letters of alphabet are not significantly different but means with different letters of alphabet attached to them are significantly different. For example, the means of reported number of deaths from road traffic accidents was highest in 1985 and 1980 and they were not significantly different from those of 1979, 1978, 1981 and 1976 but were significantly different from that of the other years. The result equally shows that reported number of deaths from road traffic accidents was highest in 1985 which also recorded the highest number of road traffic accidents. There was no Federal Road Safety Commission as at that time so motorists were reckless in the highways.

Policy Implications/Recommendations

Prevention measures should be taken which would include proper design of road networks as well as the planning of the general public transport system to ensure that it runs in an effective and efficient manner as this would reduce the volume of vehicles plying the roads; these measures must be commenced in the early stages of urban planning. To deal with the local government areas that are prone to death from road traffic accidents in Lagos State (i.e. Lagos Island, Ikorodu, Badagry, Ajerumi/Ifelodun, Lagos Mainland, Mushine, Ikeja and Epe) the authorities should provide recommendations for strong political commitment to ensure on a long term basis, appropriate monitoring of the road accident situation in which pertinent decisions can be made.

Government efforts towards road traffic accidents reduction in the study area; in the light of the findings of this study should be elaborate, total and wide spread covering every segment of the state. Both the police and the Federal Road Safety Commission (FRSC) should consider the whole of the study area as accident prone area, and thus, Police, FRSC should be treated accordingly. It is important to say that the setting up of Lagos Metropolitan Area Transport Authority (LAMATA) as additional law enforcement agents for the maintenance of the roads, towing of broken down vehicles and those involved in road traffic accidents is inevitable.

Conclusion

Accident on our roads is the leading cause of deaths in Nigeria and Road Traffic Accident (RTAs) are a particularly well-documented consequence of motorisation. While accidents occur in all modes of transport, including railways, no mode approaches the importance of the motor car in the scale of deaths and injuries caused to vehicles occupants, pedestrians and other unprotected road users. Living safely is a challenge that must be accepted by everyone, if we are to continue to move towards in an ever changing society. Those areas that are accident prone is because they are most commercialised and motorised areas of Lagos State. As Atubi (2006) further observes, traffic jams, due to deep potholes, blocked drainages and the poor road network, keep Lagos motorists on the roads for hours.

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APPENDIX 1

Reported Number of Deaths

	N	Mean	Std. Deviation	Std. Error	95% Confidence interval for Mean	
					Lower Bound	Upper Bound
Lagos Island	32	52.9063	28.1704	6.9799	42.7497	63.0628
Ikorodu	32	18.3750	8.1785	1.4458	15.4264	21.3236
Ajeromi	32	35.8750	20.3513	3.5976	28.5376	43.2124
Badagry	32	20.0313	8.0862	1.4294	17.1159	22.9466
Epe	32	14.8750	4.5984	0.8129	13.2171	16.5329
Ikeja	32	57.0313	26.8418	4.7450	47.3537	66.7088
Mushin	32	30.4375	15.5168	2.7430	24.8431	36.0319
Lagos Mainland	32	34.5938	19.4851	3.4450	27.5686	41.6189
Apapa	16	27.1250	6.3862	1.5965	23.7220	30.5280
Osodi/Isolo	16	24.1875	5.7529	1.4382	21.1220	27.2530
Surulere	16	23.8125	5.7529	1.4382	20.7470	26.8780
Shomolu	16	21.3125	6.2367	1.5592	17.9892	24.6358
Agege	13	21.5385	7.7848	2.1591	16.8342	26.2427
Ojo	13	21.6923	7.0756	1.9624	17.4166	25.9680
Eti-Osa	13	10.6154	2.1031	0.5833	9.3445	11.8863
Ibeju-Lekki	13	13.8462	2.7339	0.7583	12.1941	15.4982
Ifako-Ijaye	13	18.6923	5.3289	1.4780	15.4721	21.9125
Kosofe	13	10.6923	2.4962	0.6923	9.1839	12.2007
Alimosho	13	16.5385	5.4101	1.5005	13.2692	19.8078
Amuwo-Odoan	13	8.0769	1.7541	0.4865	7.0169	9.1369
Total	424	27.3042	20.0260	0.9725	25.3926	29.2159

Descriptive

Reported Number of Deaths

	Minimum	Maximum
Lagos Island	16.00	105.00
Ikorodu	8.00	40.00
Ajeromi	15.00	96.00
Badagry	10.00	40.00
Epe	9.00	26.00
Ikeja	18.00	104.00
Mushin	12.00	60.00
Lagos Mainland	12.00	91.00
Apapa	17.00	36.00
Osodi/Isolo	15.00	32.00
Surulere	16.00	40.00
Shomolu	10.00	31.00
Agege	10.00	32.00
Ojo	10.00	31.00
Eti-Osa	8.00	15.00
Ibeju-Lekki	10.00	20.00
Ifako-Ijaye	10.00	28.00
Kosofe	6.00	15.00
Alimosho	9.00	26.00
Amuwo-Odoan	5.00	11.00
Total	5.00	105.00

ANOVA

Reported Number of deaths

	Sum of Square	Df	Mean Square	F	Sign.
Between groups	81412.478	19	4284.867		
Within groups	88227.274	404	218.384	19.621	.000
Total	169639.75	423			

Post Hoc Tests

Homogeneous Subsets

Reported Number of Deaths

Duncan[a,b]

		Subset for alpha = .05				
Local Government Area	N	1	2	3	4	5
Amuwo-Odoan	13	8.0769				
Eti-Osa	13	10.6154	10.6154			
Kosofe	13	10.6923	10.6923			
Ibeju-Lekki	13	13.8462	13.8462	13.8462		
Epe	32	14.8750	14.8750	14.8750		
Alimosho	13	16.5385	16.5385	16.5385	16.5385	
Ikorodu	32	18.3750	18.3750	18.3750	18.3750	
Ifako-Ijaye	13	18.6923	18.6923	18.6923	18.6923	
Badagry	32		20.0313	20.0313	20.0313	20.0313
Shomolu	16		21.3125	21.3125	21.3125	21.3125
Agege	13		21.5385	21.5385	21.5385	21.5385
Ojo	13		21.6923	21.6923	21.6923	21.6923
Surulere	16			23.8125	23.8125	23.8125
Osodi/Isolo	16			24.1875	24.1875	24.1875
Apapa	16				27.1250	27.1250
Mushin	32					30.4375
Lagos Mainland	32					
Ajeromi	32					
Lagos Island	32					
Ikeja	32					
Sig.		0.066	0.062	0.083	0.073	0.072

Means for groups in homogeneous subsets are displayed.