Dominant Injuries from Road Traffic Accident Cycles 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 examine dominant injuries from road traffic accident cycles in Lagos State, Nigeria (1970-2001). The reported dominant injuries from road traffic accident cycles in the 20 local government areas of Lagos State were compared using the analysis of variance (ANOVA). The results showed that for the two factors, local government areas and years, the f-calculated of 21.34 and 9.77 respectively were higher than the f-tabular of 1.57 and 1.46 respectively at 0.05 level of significance. It then implies that the means for each of the factors, reported injuries from road traffic accidents across the 20 local government areas of Lagos State and across different years were significantly different. Based on the findings, recommendations were proffered on how to reduce the phenomenon of injuries from traffic accidents in Lagos State.

Keywords: *Cycles; injuries; dominant; traffic; accidents; motor.*

1. Introduction

In Nigeria, road traffic accident situation over the last three decades has been particularly disturbing. In 1976, there were 53,897 road traffic accidents resulting in 7,717 deaths. Although in 1981, the magnitude reduced to 5,114 accidents, but the fatality increased to 10,236 which means that there was an average of 96 accidents and situation in subsequent years has not been any better. The number of people killed in road accidents between 1990 and 2005 rose from 28,253 and the fatality rate remains consistently high (Atubi, 2009c).

International comparison indicates that the chance of a vehicle killing someone in Nigeria is 47 times higher than in Britain. The proportion of fatalities to injuries reported is also very high. For example, while Czech Republic has only one death in 175 accident, France one death in 175, South Africa one death in 47 accidents, Nigeria has one death in 2.65 accidents (Atubi, 2010b; Atubi and Onokala, 2009; Atubi, 2012n).

Based on data that are at best conservative estimates, Nigeria is a country with a serious and growing road accident problem that is among the worst in the world (Asogwa, 2002). Analysis of global statistics indicates that fatality rates (per licensed vehicle) in developing countries are high in comparison with those of developed countries (Adeniji, 2002). African countries in particular have rates often 30 to 50 times greater than those in the countries of western Europe.

Road traffic accidents' statistics in Nigeria reveal a serious and growing problem with absolute fatality rate and casualty figure 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 (Onakomaiya, 1988; Gbadamosi, 2002; Atubi and 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).

At the global level, road accidents have been ranked as the 9th leading cause of mortality (World Health Organisation, 1998). The World Health Organisation (WHO) estimated that 1.17 million deaths occur each year world wide due to road traffic accidents. Succinctly, this accounts for about 70% of deaths in developing counties such as Nigeria. The increased rate of fatal road traffic accidents worldwide has been attributed to population explosion and increased motorization (Atubi, 2008 and 2012d). Increased motorization may be characterised briefly as the "automotive revolution", that is, the motorizing of urban population especially in the developing countries.

As in other developing countries, road traffic accidents in Nigeria are one of the most serious problems in need of pragmatic solutions. Yet this problem has been difficult to address probably because of the country's level of development. Nigeria is said to have the highest road traffic accident rate in Africa and second in the world (Obinna, 2007, p. 35; Atubi, 2012c).

Nigeria, like other developing countries, is experiencing a rapid increase in motorization without having adequate road traffic safety mechanisms in place to control the growing number of road traffic crashes and injuries. As reported for other low-and-middle income countries, the main victims are pedestrians, cyclists and public transport passengers (Nantulya et al, 2003; Downing, 1991).

It has been estimated that over 300,000 persons die and 10-15 million persons are injured every single year in road accidents throughout the world (Afukaar, 2003; Krug, 2003; Atubi 2010a and 2011a). Detailed analysis of global accident statistics indicates that fatality rates per licensed vehicle in developing countries are very high in comparison with the industrialised countries. Moreover, road traffic accidents have

been shown to cost around one percent of annual gross national product (GNP) resources of the developing counties which they can ill-afford to lose (Afukaar, 2003; Atubi, 2011b, 2012d and Atubi and Onokala, 2009).

Indeed the Nigeria accident pattern seems to suggest that the better the road, the higher the accident and fatality rate as well as the severity and non-survival indices because of driver non compliance with speed limits (Onakomaiya, 1988; Gbadamosi, 1994; Filani and Gbadamosi, 2007).

2. Study Area

Lagos State is a suitable case study because it hosts metropolitan Lagos, Nigeria's major traffic centre, fastest growing city, and most heavily motorized urban area in the country. Consequently, the state has one of the highest accident and casualty rates in the country (Federal Republic of Nigeria, 1997, p. 6). Moreover, the traffic situation in Lagos State is bad because of the absence of effective planning, vehicle-misuse, poor management, inadequate street parking, traffic congestion, delays and accidents among other contributory factors.

Lagos State is situated in the South Western corner of Nigeria. This elongated state spans the Guinea Atlantic coast for over 180km, from the Republic of Benin on the west to its boundary with Ogun State in the east (Figure 1), while Lagos State is the smallest in Nigeria, it has over 5 percent (i.e. 9,013,534) of the country's estimated 140 million people (National Population Census, 2006). Its rate of population growth has been in excess of 9 percent per annum, or 25,000 per month or 833 per day or 34 per hours in the last decade (Lagos urban Transport Project, 2002). This population increase has been accompanied by a corresponding increase in motor vehicles and traffic accidents. However, accident rates in Lagos State are still very much on the high side compared to other states in the federation. But, fatalities and non-survival indices for the state are on the decline. This is attributable to its high level of traffic congestion (which reduces the probability of the high fatality accidents resulting from over speeding) and accessibility to good post – crash medical care in the Lagos metropolitan area.

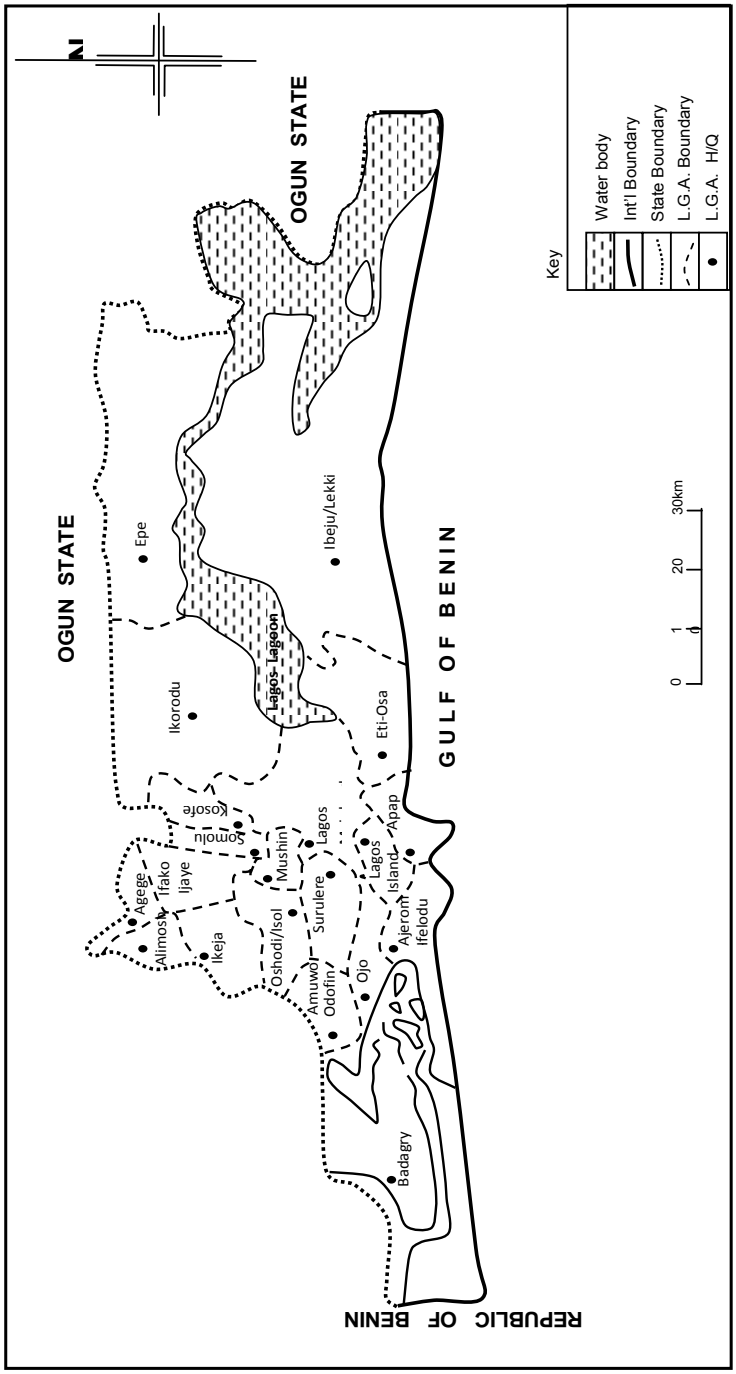

FIG. 1: MAP OF LAGOS STATE SHOWING THE 20 L.G.AS

Source: Lagos State Ministry of Environment and Physical Planning (1999)

3. Research Methodology

This study in a broad sense, undertakes an analysis of dominant injuries from road traffic accident cycles in Lagos State, Nigeria for a period of 32 years (1970-2001). Secondary data were collected from various sources, which include the records of the Federal Road Safety Commission, the Nigeria Police Force, Federal Ministry of Transport and the Federal office of Statistics. The study data were collected and organized into graphs and tables. Then the analysis of variance statistics (ANOVA) techniques were used to test for the significance of variability in injures from road traffic accidents in Lagos State.

4. Discussion of Results/Findings

Table 1 shows that for Lagos State as a whole dominant cycles of reported number of injured from road traffic accidents observed have periodicities of 32.00, 10.67 and 16.00 years with the most dominant being 32.00 years. This means that, the dominant and strongest number of inured from road traffic accident pattern over Lagos State repeats itself every 32 years.

Table 1. Dominant Injured from Road Traffic Accidents in Lagos State.

Location		Cycles (Years)	% Variance	Amplitudes
Lagos State	1st	32.00	29.15	135.20
	2nd	10.67	10.02	79.28
	3rd	16.00	8.40	72.60
Lagos Island	1st	32.00	54.99	26.61
	2nd	2.46	7.65	9.92
	3rd	10.67	4.27	7.42
Ikorodu	1st	32.00	20.60	9.01
	2nd	5.33	12.79	7.10
	3rd	10.67	8.29	5.72
Ajeromi/Ifelodun	1st	32.00	51.44	21.87
	2nd	10.67	5.11	6.89
	3rd	4.00	5.08	6.82
Badagry	1st	2.91	20.72	6.55
	2nd	32.00	13.97	5.38
	3rd	10.67	12.59	5.11
Epe	1st	32.00	47.74	7.83
	2nd	8.00	6.88	2.97
	3rd	5.33	5.18	2.58
Ikeja	1st	32.00	48.90	23.06
	2nd	2.46	8.09	9.38

	3rd	5.33	3.13	5.83
Mushin	1st	32.00	61.71	21.96
	2nd	4.00	5.81	6.74
	3rd	2.46	3.55	5.27
Lagos Mainland	1st	32.00	60.74	27.12
	2nd	2.46	4.97	7.76
	3rd	10.67	3.39	6.41

Local government areas such as Lagos Island, Ikorodu, Ajeromi/Ifelodun, Epe, Ikeja, Mushin and Lagos Mainland Local Government Areas, a dominant cycle of 32 years is observed. Other strong cycles, a fairly short one of 2.46 years and a short period one of 10.67 years are also 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 area (Figures 2-10).

An inspection of the power spectra for Ajeromi/Ifelodun, Lagos Island, Epe and Ikeja Local Government Areas (Figs. 3 and 5) shows no regularity in the occurrence of injured from road traffic accident patterns, although 32.00 years is the most dominant cycle. Also, an inspection of the power spectra for Ikorodu, Badagry and Lagos Mainland Local Government Areas (Figs. 4, 6 and 10) shows some regularity in the occurrence of injured from road traffic accident patterns.

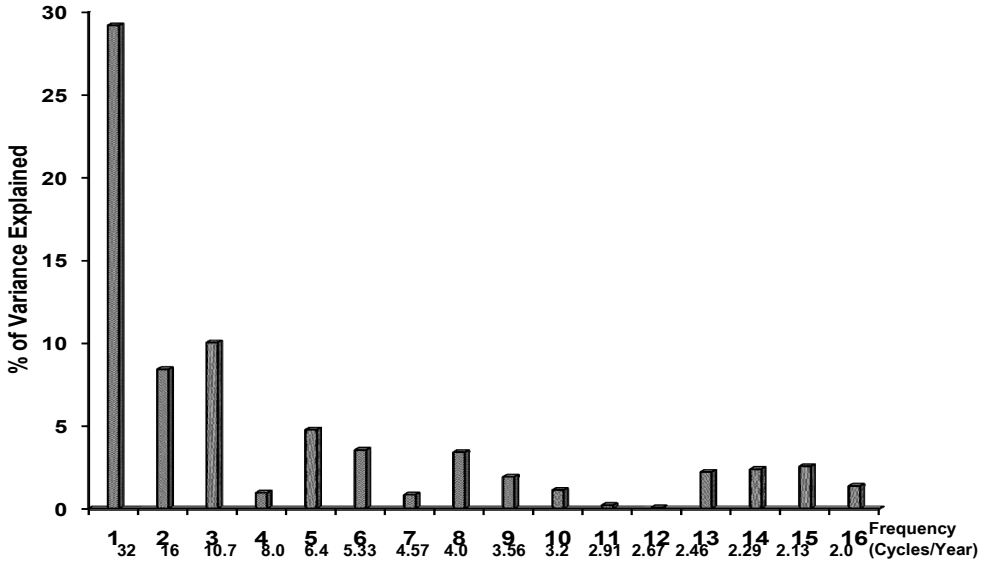

Fig. 2: Variance Spectrum for Lagos State on the Number of Injured From Road Traffic Accidents.

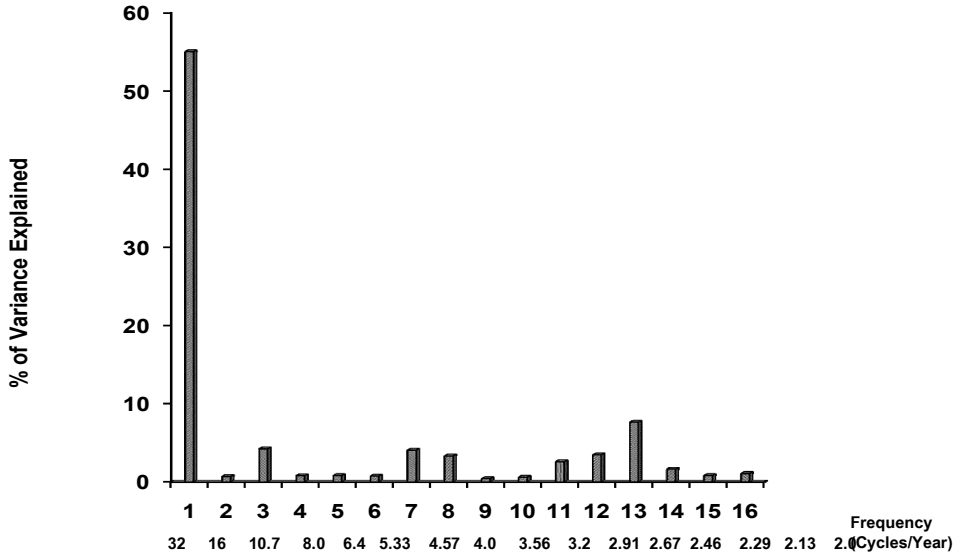

Fig. 3: Variance Spectrum For Lagos Island Local Government Area On The Number Of Injured From Road Traffic Accidents.

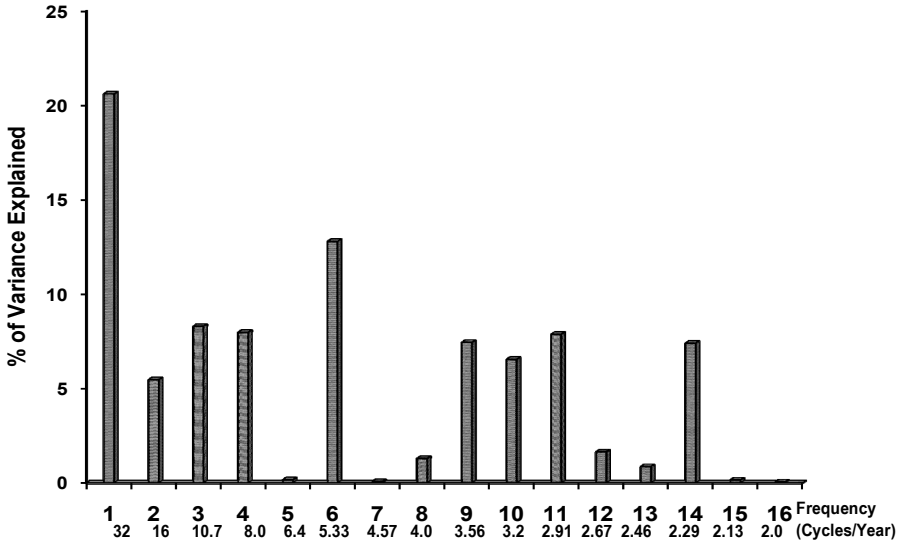

Fig. 4: Variance Spectrum For Ikorodu Local Government Area On The Number Of Injured From Road Traffic Accidents.

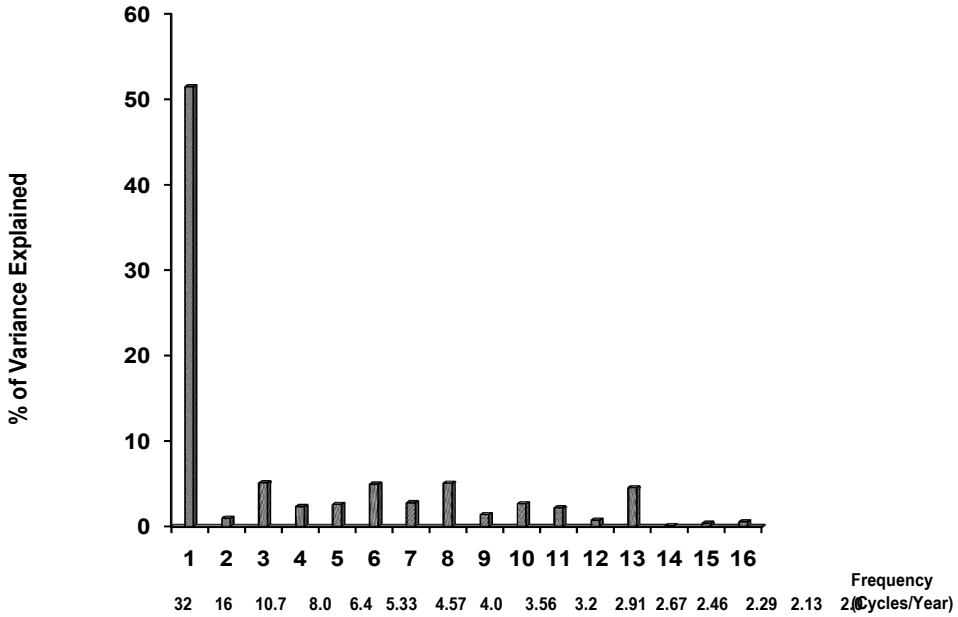

Fig. 5: Variance Spectrum For Ajeromi/Ifelodun Local Government Area On The Number Of Injured From Road Traffic Accidents.

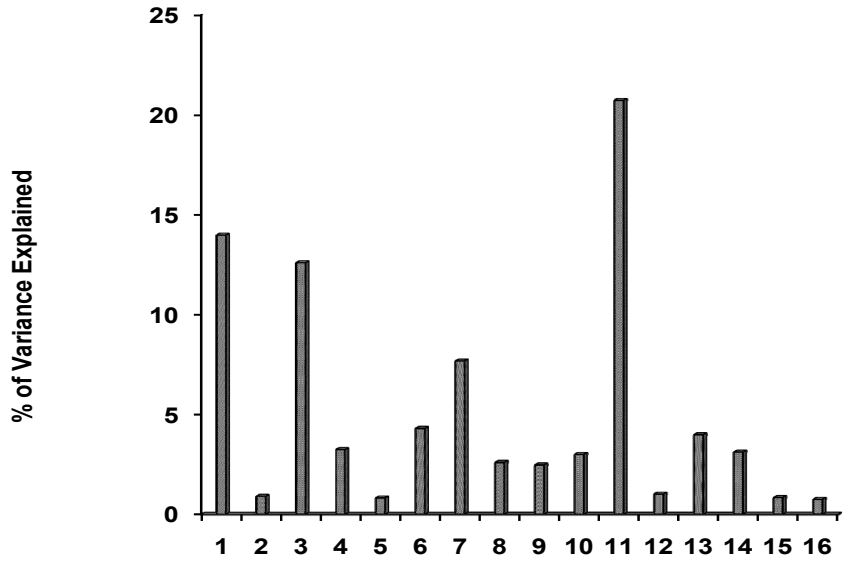

Fig. 6: Variance Spectrum For Badagry Local Government Area On The Number Of Injured From Road Traffic Accidents.

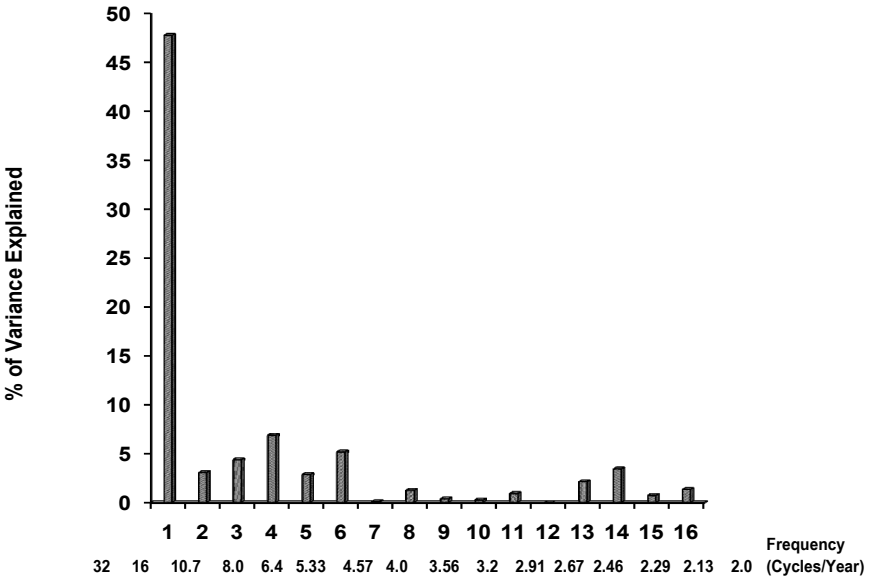

Fig. 7: Variance Spectrum For Epe Local Government Area On The Number Of Injured From Road Traffic Accidents.

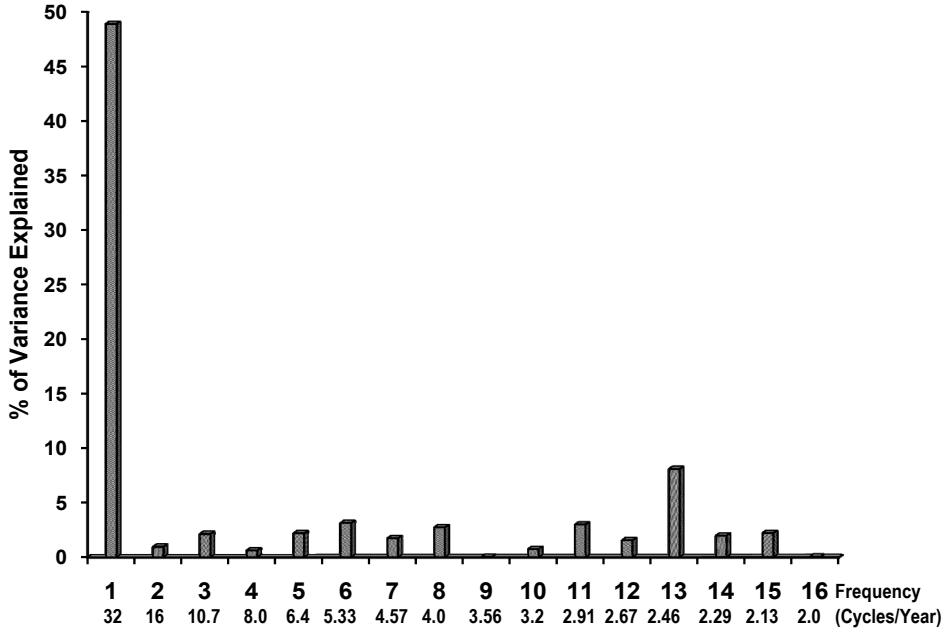

Fig. 8: Variance Spectrum For Ikeja Local Government Area On The Number Of Injured From Road Traffic Accidents

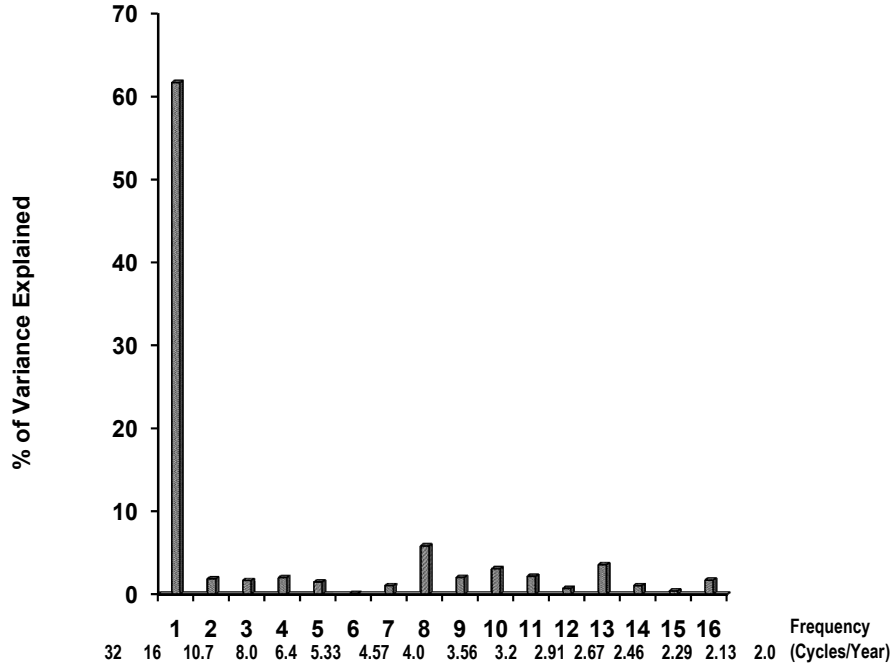

Fig. 9: Variance Spectrum For Mushin Local Government Area On The Number Of Injured From Road Traffic Accidents

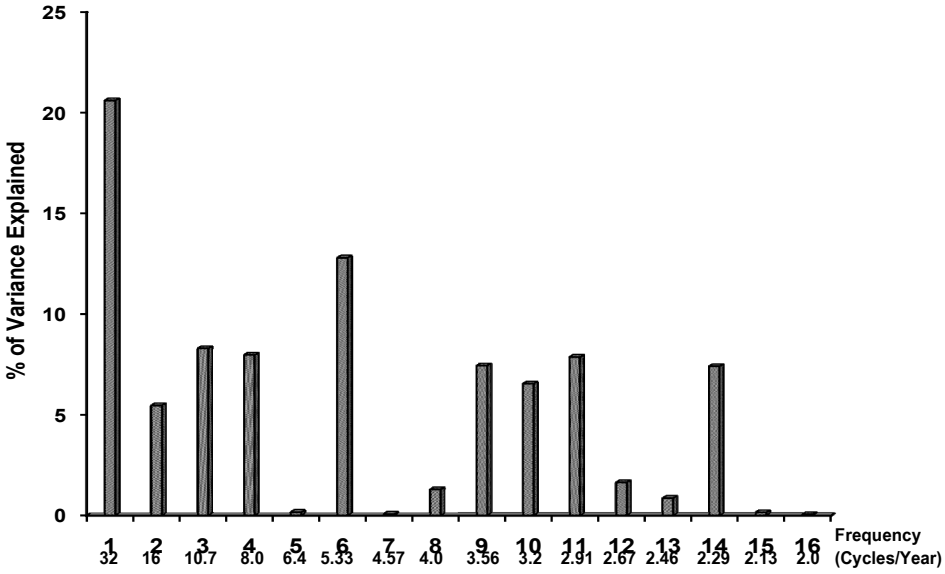

Fig. 10: Variance Spectrum For Lagos Mainland Local Government Area On The Number Of Injured From Road Traffic Accidents.

The reported number of injured from road traffic accidents in the twenty Local Government Areas in Lagos State from 1970 to 2001 were compared using analysis of variance (ANOVA). Two one way ANOVA, one for testing difference between the reported number of injured from road traffic accidents across the twenty Local Government Areas and the other for testing difference between the reported number of injured from road traffic accidents and across different years, 1970 to 2001. The result showing the ANOVA table for the mean comparisons are presented in table 2.

Table 2: Analysis of variance for reported number of injured 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	944.77.49	19	4972.50	21.34	1.57
	Within L.G.A.	94138.28	404	233.02		
	Total	188615.77	423			
Years (1970 – 2001)	Between years	82220.67	31	2652.28	9.77	1.46
	Within years	106395.11	392	271.42		
	Total	188615.77	423			

The result shows that for the 2 factors, Local Government Areas and years, the calculated F-ratios of 21.34 and 9.77 respectively at 0.05 level of confidence were higher than the table F-ratios of 1.57 and 1.46 respectively. Since the F-calculated were higher than F-table at 0.05 level of confidence, it then implies that the means for reported number of injured 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, Duncan New Multiple Range Test (DNMRT) was used for mean comparisons. The result for the mean comparisons for different Local Government Areas and that for different years (1970 –2001) are shown in tables 3 and 4 respectively.

Table 3. Means of reported number of injured from road traffic accidents in different LGA'S in Lagos State.

S/No	L.G.A	N	Means
1	Ikeja	32	69.81a
2	Lagos mainland	32	62.03ab
3	Lagos Island	32	60.31ab
4	Ajeromi/Ifelodun	32	52.94bc
5	Mushin	32	47.25c
6	Apapa	16	46.81c
7	Oshodi/Isolo	16	36.63d
8	Ikorodu	32	36.09d
9	Surulere	16	35.50d
10	Badagry	32	34.13d
11	Alimosho	13	34.08d
12	Agege	13	33.62d
13	Ojo	13	32.69ef
14	Epe	32	30.53ef
15	Shomolu	16	29.75ef
16	Ifako-Ijaye	13	25.46efh
17	Amuwo-odofin	13	22.08fgh
18	Ibeju-Lekki	13	21.54gh
19	Kosofe	13	21.38gh
20	Eti-osa	13	14.62i

In table 3, 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 mean that have a different letter of alphabet attached to them are significantly different. For example, from table 3, the means of reported number of injured from road traffic accidents in Ikeja Local Government Area is not significantly different and significantly different from those in Lagos Mainland and Lagos Island Local Government Areas which are not significantly different. However, that of Ajeromi/Ifelodun Local Government Area is significantly different from that of Mushin Local Government Area and Apapa Local Government Area, although that of Oshodi/Isolo Local Government Area is not significantly different from those of Ikorodu, surulere, Badagry, Alimosho, Agege, Ojo and Epe Local Government Areas. The result suggests that although Kosofe and Agege Local Government Areas had the highest reported accidents, the road traffic accidents

were not serious as much as injured were reported in Ikeja and Lagos mainland Local Government Areas (Fig. 11).

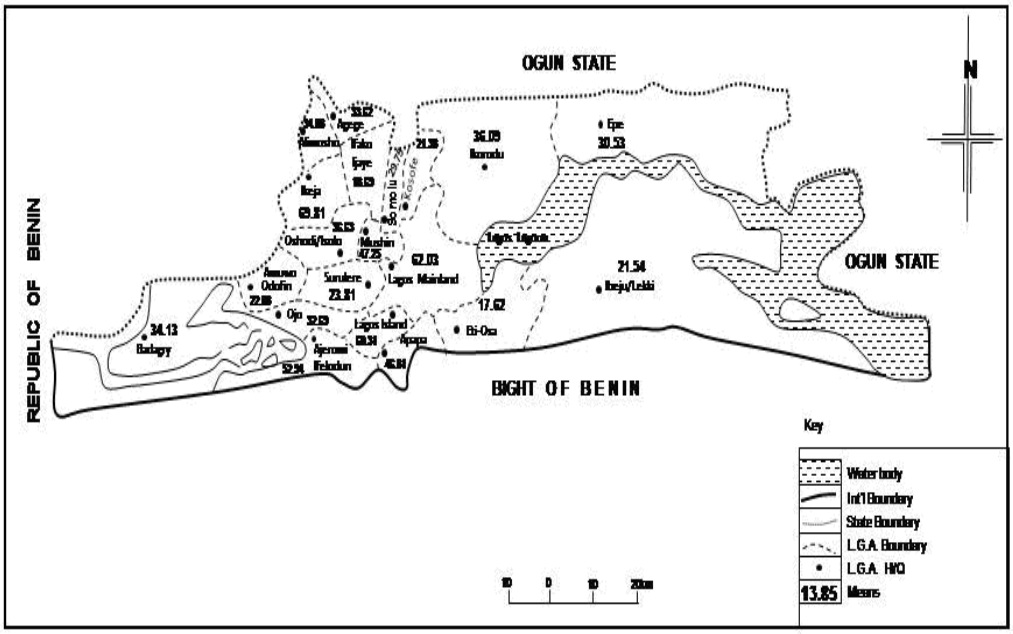

FIG. 11 : MAP OF LAGOS STATE SHOWING L.G.A'S WITH MEANS OF REPORTED NUMBER OF INJURED FROM R.TA'S

Source: Adopted from Table 3

In table 4, the means were equally arranged from the highest down to the lowest. The letter of alphabet indicates significant difference. Means with the same letters of alphabet attached to them are significantly different. For example, the means of reported number of injured form road traffic accidents was highest in 1980 and 1985 and they were not significantly different from those of 1979, 1981, 1973, 1978, 1976, 1988 and 1977 but were significantly different from that of the other years. The result shows that reported number of injured form road traffic accident was highest in 1980 which also recorded the highest number of road traffic accidents (Table 4).

Table 4: Means of Reported Number of Injured from Reported Road Traffic Accidents from 1970 to 2001

S/N	Years	N	Mean
1	1980	8	75.75a
2	1985	8	72.50ab
3	1979	8	70.13ab
4	1981	8	67.63abc
5	1973	8	66.38abcd
6	1978	8	66.25abcd
7	1976	8	64.50abcd
8	1988	12	60.50abcd
9	1977	8	60.00abcd
10	1975	8	58.50f
11	1982	8	57.50f
12	1986	12	52.17fg
13	1984	8	5188fg
14	1983	8	50.13fgh
15	1974	8	48.25fghi
16	1987	12	46.42fghij
17	1989	20	38.80ghlij
18	1994	20	37.65ghij
19	1993	20	34.60hijk
20	1990	20	34.45hijk
21	1971	8	34.13hijk
22	1970	8	32.38ijk
23	1991	20	32.25ijk
24	1997	20	32.15ijk
25	1972	8	32.00ijk
26	1996	20	31.75ijk
27	1995	20	31.70ijk
28	2001	20	31.60ijk
29	1998	20	31.30jkl
30	1999	20	29.85kl
31	1992	20	29.60ki
32	2000	20	29.10m

5. Policy Implications/Recommendations

By the serious road traffic accident situation in the study area, Local Government Areas like Lagos Island, Lagos Mainland, Ajeromi/Ifelodun, Ikeja, Alimosho, Apapa, Badagry, Surulere and Oshodi/Isolo Local Government Areas can be described as accident prone areas because they are all associated with high accident rate, high number of death, high number of injuries and so on(Fig. 11). This trend therefore, suggest that these Local Government Areas of Lagos State are associated with the menace of road traffic accidents and these deserves urgent attention and appropriate policy intervention.

There should be measures aimed at children, particularly through schools and parents to in-still ideas of good road behaviour. The educationist should be responsible for incorporating traffic education into the curricular of primary and secondary school systems as well as seeing to the establishment, accreditation and supervision of driving schools, and nation wide organisation of defensive driving courses, which had been found most useful in reducing accident rate among all classes of drivers.

Preventive measures should also 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.

Public awareness is also important for the successful implementation of a comprehensive road traffic crash reduction programme. To that end, all stakeholders, such as schools, media, the private sector, the general public and civil society, including religious groups, can join hands in the fight against road traffic injures.

6. 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 motorization. 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.

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