

PERIODIC OSCILLATIONS AND CYCLES OF FATALITIES FROM ROAD TRAFFIC ACCIDENTS IN LAGOS, NIGERIA

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Abstract

This study examined the periodic oscillations and cycles of fatalities from road traffic accidents in Lagos State, Nigeria. The variance spectra for Ajeromi/Ifelodun, Ikorodu, Badagry, Epe and Ikeja Local Government Areas showed no regularity in the occurrence of fatalities from road traffic accident patterns, although 32.00 years is the most dominant cycle. However, Local Government Areas, like Lagos Island, Mushin and Lagos Mainland, showed some regularity in the occurrence of fatalities from road traffic accident patterns. Incidentally, these local governments were prone to accidents in Lagos State. The reported fatalities from road traffic accidents in Lagos State were compared using analysis of variance (ANOVA) techniques. The results showed that for the two factors, Local Government Areas and years, the F-calculated values of 19.62 and 9.72 respectively were higher than the F-tabular values of 1.57 and 1.46 respectively at 0.05 level of significance. It then implied that the means for each of the factors were significantly different. Based on the findings, policy recommendations were proffered on how to reduce the ugly incidence of road traffic fatalities in Lagos State and Nigeria in general.

Introduction

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, 1996; 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 organized 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).

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

All over the world the phenomenon of road traffic accident has become the most serious traffic problem in need of a pragmatic solution. In Nigeria this problem has been difficult to address probably because of the country's level of development. At the end of 2011, Nigeria was known to have

topped the list of 155 countries worldwide with the highest records of death by road traffic accidents (WHO, 2012; Atubi, 2012h).

A study of road traffic accident trends in Nigeria between the period 1960 and 2001 revealed a sharp increase in fatal accident occurrence. Between 1960 and 2001, it was observed that over 18,000 deaths occurred as a result of road accidents. 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).

According to Federal Road Safety Corps, between 1970 and 2001, Nigeria recorded a total of 726,383 road traffic accidents resulting in the death of 208,665 persons and injuries to another 596,425. In that period, each succeeding year recorded more accidents, deaths and injuries. Also, between 1997 and 2002, Lagos State alone recorded a total of 17,141 road accidents resulting in the death of 3,132 persons and injuries to 9,972 persons.

Thus, Nigeria's annual 8,000 to 10,000 accident deaths between 1980 and 2003 were a major personal and traffic safety problem as well as a terrible waste of human resources for the country. In terms of the personal safety problem, Nigeria and indeed Lagos State is a high risk region with an average of 32 traffic deaths per 1,000 people (Filani et al, 2007; Atubi, 2012c). This is very high compared with the United States' 1.6 traffic deaths per 1,000 population and with the United Kingdom's 1.4 deaths per 1,000 people (Trinca et al, 1988). In terms of traffic safety, there are on average 23 accidents per 1,000 vehicles in Nigeria (i.e. 230 per 10,000 vehicles) far in excess of the accident rate in the USA (2.7 accidents per 10,000 vehicles) and the UK (3.2 accidents per 10,000 vehicles).

According to data from the Nigerian 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 – vehicles crashes (FRSC, 2006; Obinna, 2007, P. 35). Nigeria is followed by Ethiopia, Malawi, and Ghana with 219,182 and 178 deaths per 10,000 vehicles respectively (Daramola, 2004).

In an effort to check this alarming trend, the Nigerian Federal Government inaugurated the Federal Road Safety Commission (FRSC) in 1988. The commission's functions include, among others, the regular patrol of the highways with the aim of checking reckless driving. But for this function to be performed effectively, the FRSC and the police have to be familiar with the temporal distribution of road traffic accidents in the country i.e., they must know where road traffic accident are most frequent. For instance, in our study area of Lagos State, the most accident fatality prone Local Government Areas (LGAs) are Lagos Island, Ikorodu, Ajeromi/Ifelodun, Badagry, Epe, Ikeja, Mushin and Lagos Mainland. Thus, these are the LGAs that deserve urgent traffic accident mitigation attention e.g. intensified policing by the road safety corps.

Study area

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 (Fig 3.1). It extends approximately from latitude 6⁰2' North to 6⁰4' North and from longitude 2⁰45' East of its total area of 3,577sq.km, about 787sq.km or 22 percent is water. Such an environment is bound to affect settlement in Lagos, and that is why the town is composed of separate sections connected by bridges.

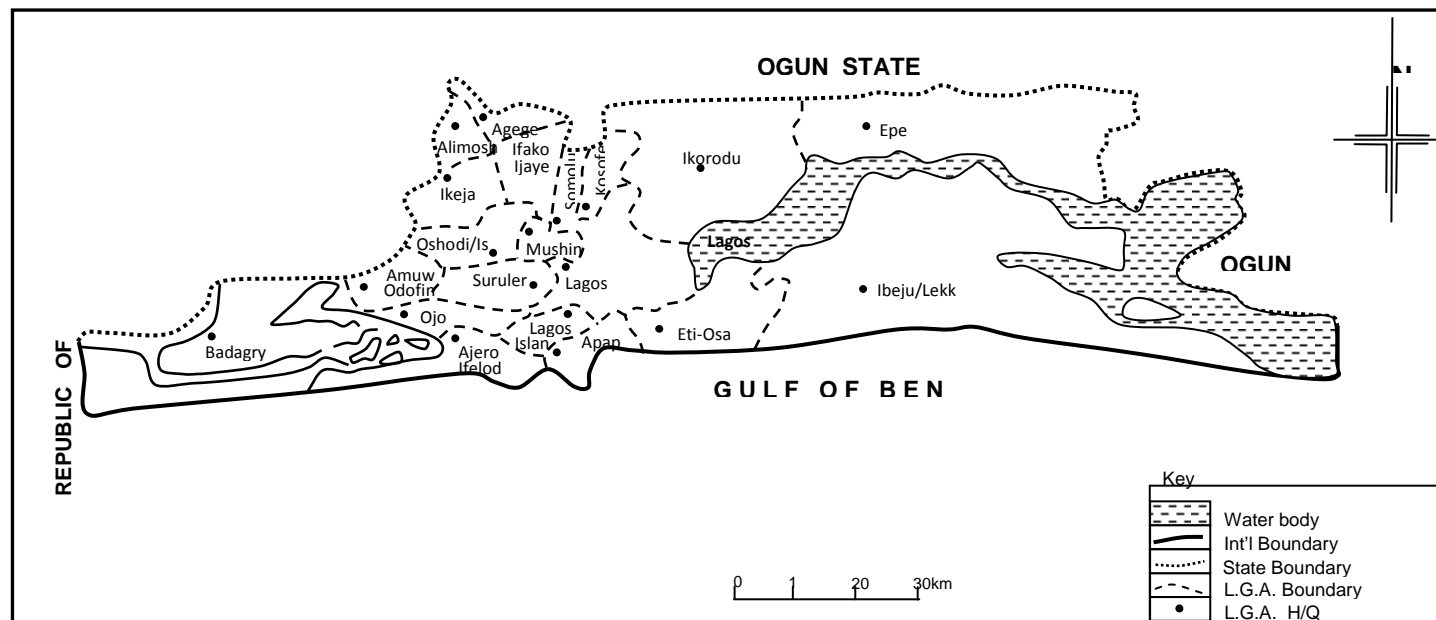


Fig. 3.1: Map of Lagos State showing the 20 LGAs
Source: Lagos State Ministry of Environment and Physical

Methodology

In a broad sense, the study undertook an analysis of cycles and periodicities of fatality from road traffic accidents 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, Federal Ministry of Transport and the Federal Office of Statistics. Data were collected and organized into graphs and tables. Analysis of variance (ANOVA) was used to test for the significance of variability in the fatalities.

Discussion of Results/Findings

Table 3.1 shows periodicities of 32.00, 10.67 and 4.00 years, with the most dominant being 32 years, for dominant cycles of reported number of deaths from road traffic accidents observed for Lagos State as a whole. This means that the dominant and strongest number of fatalities repeats itself every 32 years. This also means that, if the traffic situation is not given attention by the relevant authorities, high rates of reported number of deaths from road traffic accident will repeat itself by the year 2033 in the first instance and the year 2055.

For Local Government Areas, such as Ikorodu, Ajeromi/Ifelodun, Badagry, Epe, Ikeja, Mushin and Lagos Mainland, a dominant cycle of 32 years was observed. Variance spectra for the percentage variance explained by each harmonic have been drawn for Lagos State as a whole (see Fig. 3.2) as well as each Local Government Area (Figs. 3.2-3.10).

An inspection of the power spectra for Ajeromi/Ifelodun, Ikorodu, Badagry, Epe and Ikeja Local Government Areas (Figs. 3.4 -3.8) showed no regularity in the occurrence of deaths from road traffic accident patterns, although 32.00 years was the most dominant cycle.

Also, an inspection of the power spectra for Lagos Island, Mushin and Lagos Mainland Local Government Areas

(Figs. 3.3, 3.9 and 3.10) shows some regularity in the occurrence of deaths road traffic accident patterns. The reported number of fatalities from road traffic accidents in the local government areas of Lagos state from 1970-2001 were compared using analysis of variance (ANOVA) (see Table 3.2).

Table 3.1: Dominant Deaths from Road Traffic Accident in Lagos State

Location		Cycles (Years)	% Variance	Amplitudes
Lagos State	1 st	32.00	27.81	73.50
	2 nd	10.67	32.13	65.59
	3 rd	4.00	9.57	43.12
Lagos Island	1 st	4.00	9.17	32.44
	2 nd	5.33	8.71	31.62
	3 rd	2.29	8.38	31.01
Ikorodu	1 st	32.00	50.27	8.20
	2 nd	3.56	10.82	3.80
	3 rd	5.33	9.15	3.50
Ajeromi/Ifelodun	1 st	32.00	57.26	1.78
	2 nd	6.40	6.08	7.10
	3 rd	4.00	4.92	6.38
Badagry	1 st	32.00	50.21	8.10
	2 nd	2.91	9.55	3.53
	3 rd	10.67	9.41	3.51
Epe	1 st	32.00	59.03	5.00
	2 nd	10.67	7.30	1.76
	3 rd	8.00	7.27	1.75
Ikeja	1 st	32.00	58.75	29.98
	2 nd	10.67	12.39	13.77
	3 rd	5.33	4.28	8.09
Mushin	1 st	32.00	53.21	16.92
	2 nd	4.00	5.81	5.59
	3 rd	5.33	5.71	5.54
Lagos Mainland	1 st	32.00	47.14	19.10
	2 nd	2.91	7.60	7.67
	3 rd	4.00	6.66	7.06

The result shows that for the two factors, Local Government Areas and years, the f-calculated 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 value at 0.05, it then implies that the means for reported fatalities from road traffic accidents for each of the two factors were significantly different (see Appendices 1 and 2) for result of the mean comparisons for different Local Government Areas and for different years in Lagos State from 1970-2001.

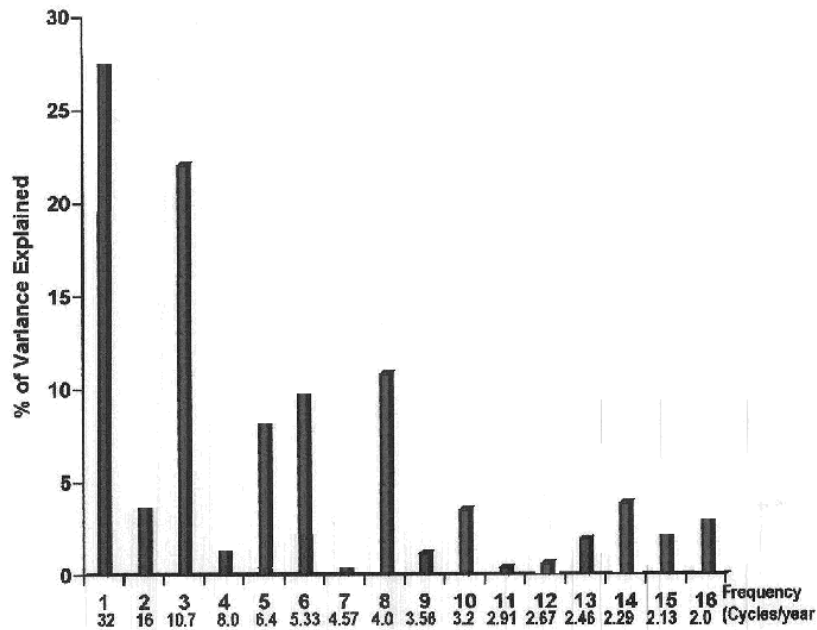


Fig. 3.2: Variance Spectrum for Lagos State on the number of Deaths from road traffic accidents.

POLICY RECOMMENDATIONS/IMPLICATIONS

By the serious fatalities from road traffic accident situation in the study area, Local Government Areas like Lagos Island, Ikorodu, Ajeromi/Ifelodun, Badagry, Epe, Ikeja, Mushin and Lagos Mainland can be described as accident prone areas, because they are all associated with high accident rate, high number of fatalities and so on (see Fig. 3.11). This trend

therefore, suggest that these Local Government Areas of Lagos State are associated with the menace of fatalities from road traffic accidents and these deserves urgent attention and appropriate policy intervention.

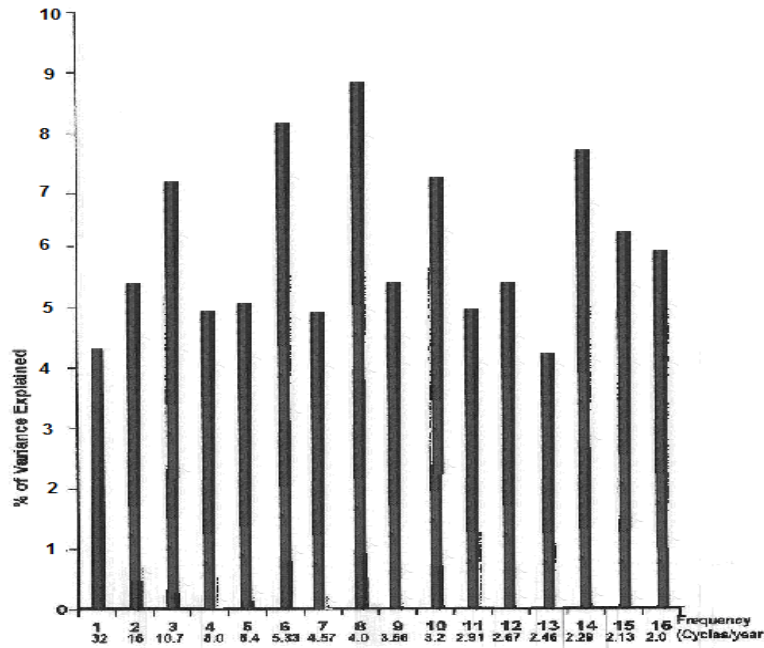


Fig. 3.3: *Variance Spectrum for Ikeja Local Government Area on the number of Deaths from road traffic accidents.*

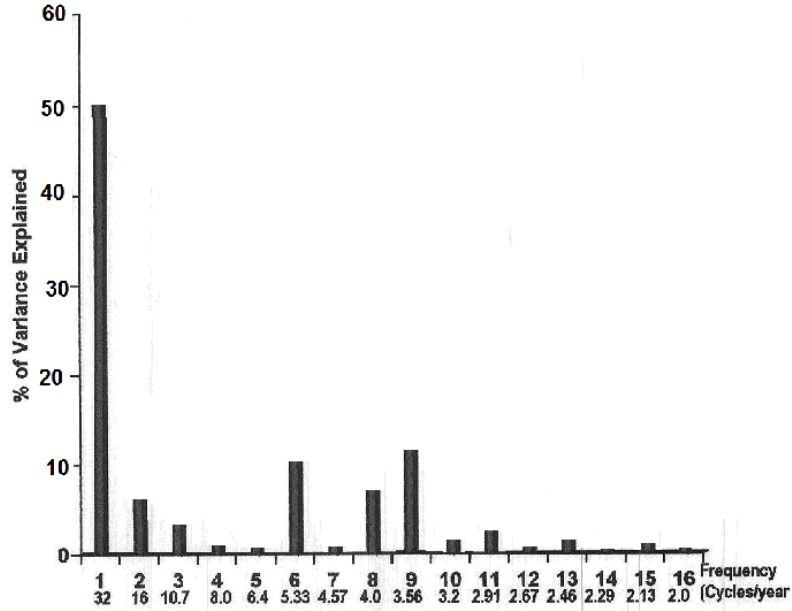


Fig. 3.4: *Variance Spectrum for Ikorodu Local Government Area on the number of Deaths from road traffic accidents.*

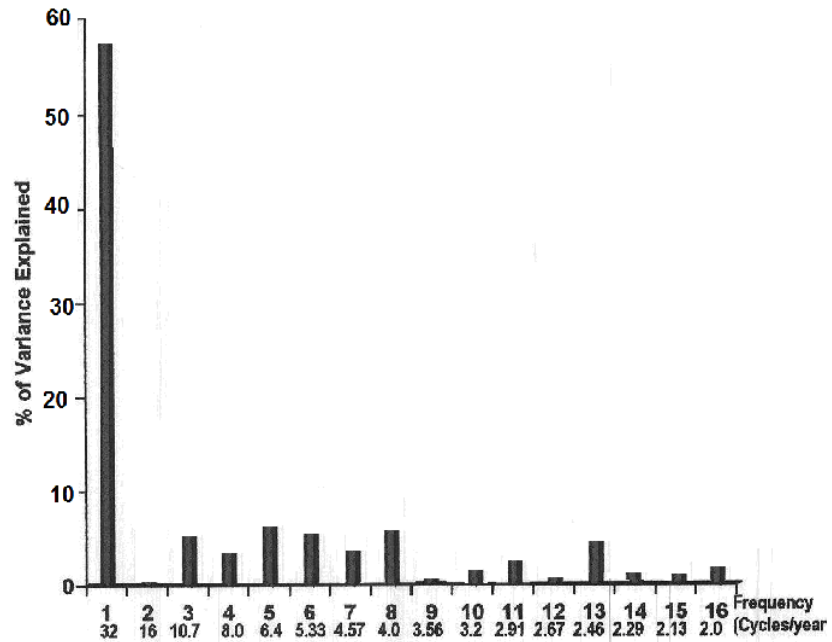


Fig. 3.5: *Variance Spectrum for Ajeromi/Ifelodun Local Government Area on the number of Deaths from road traffic accidents.*

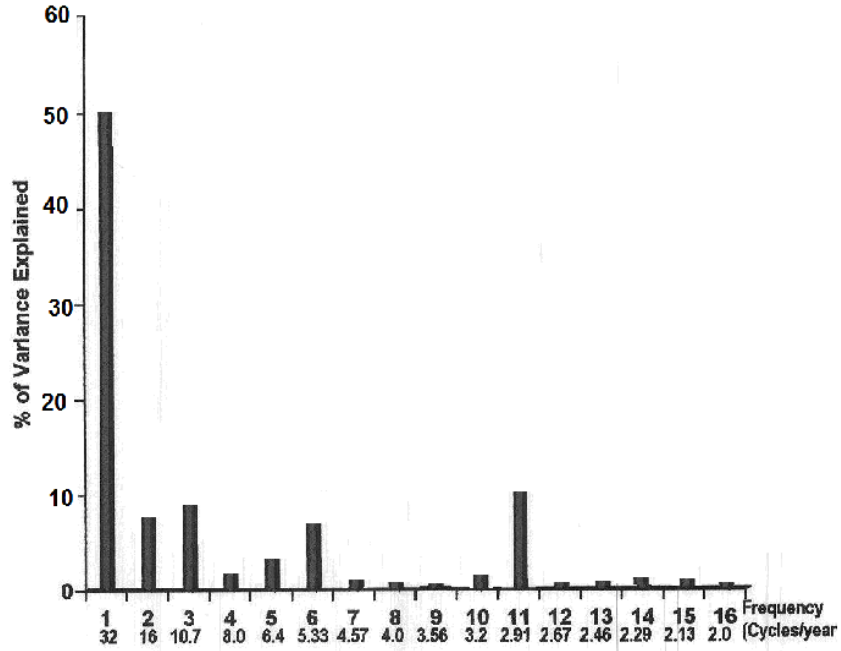


Fig. 3.6: Variance Spectrum for Badagry Local Government Area on the number of Deaths from road traffic accidents.

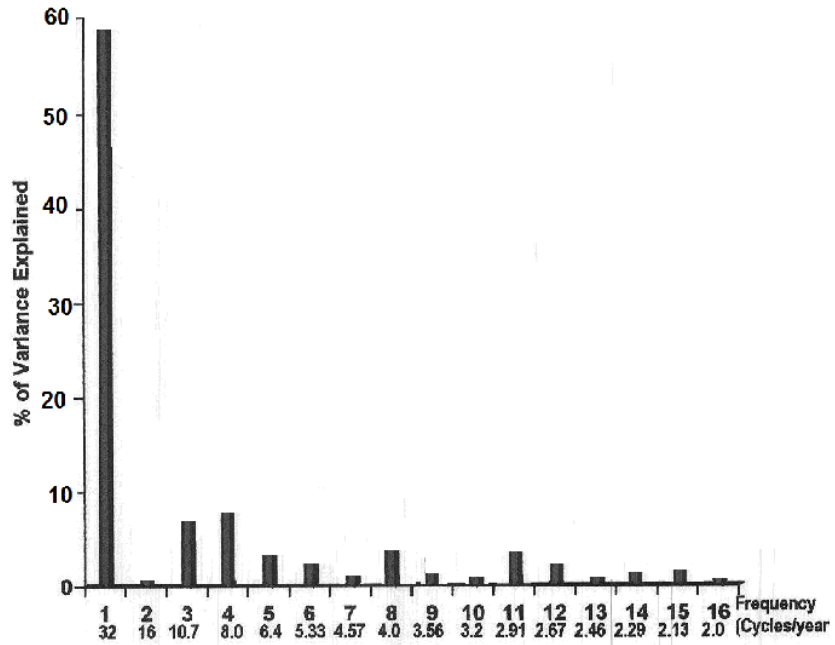


Fig. 3.7: *Variance Spectrum for Epe Local Government Area on the number of Deaths from road traffic accidents.*

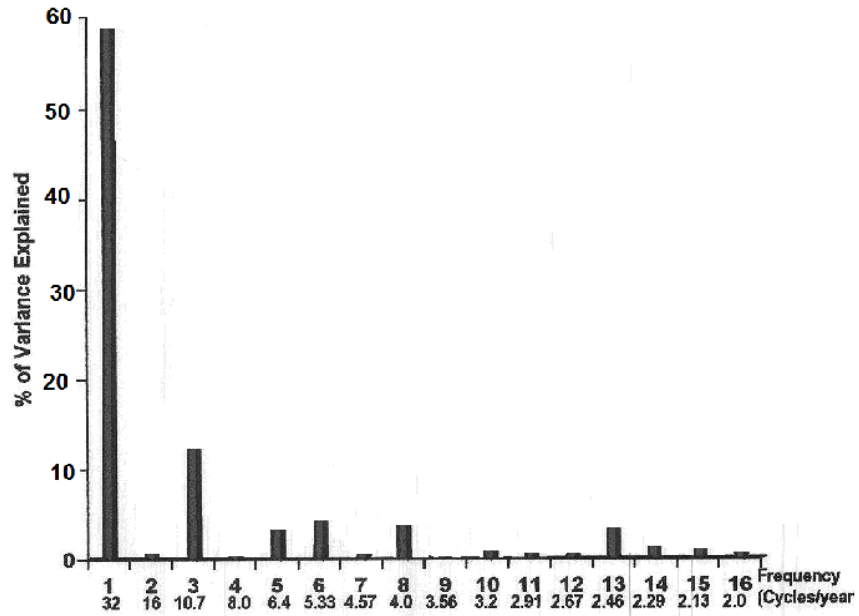


Fig.3. 8: Variance Spectrum for Ikeja Local Government Area on the number of Deaths from road traffic accidents.

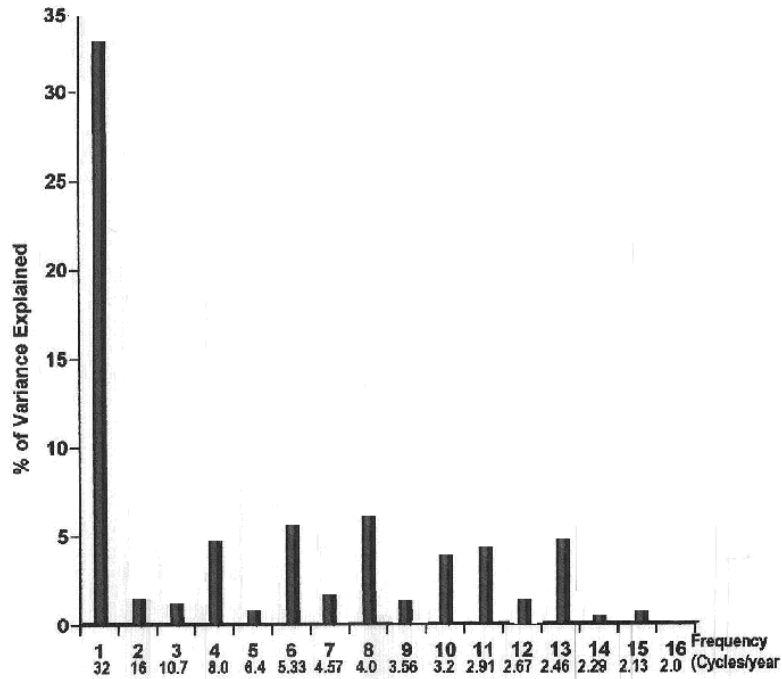


Fig. 3.9: *Variance Spectrum for Ikeja Local Government Area on the number of Deaths from road traffic accidents.*

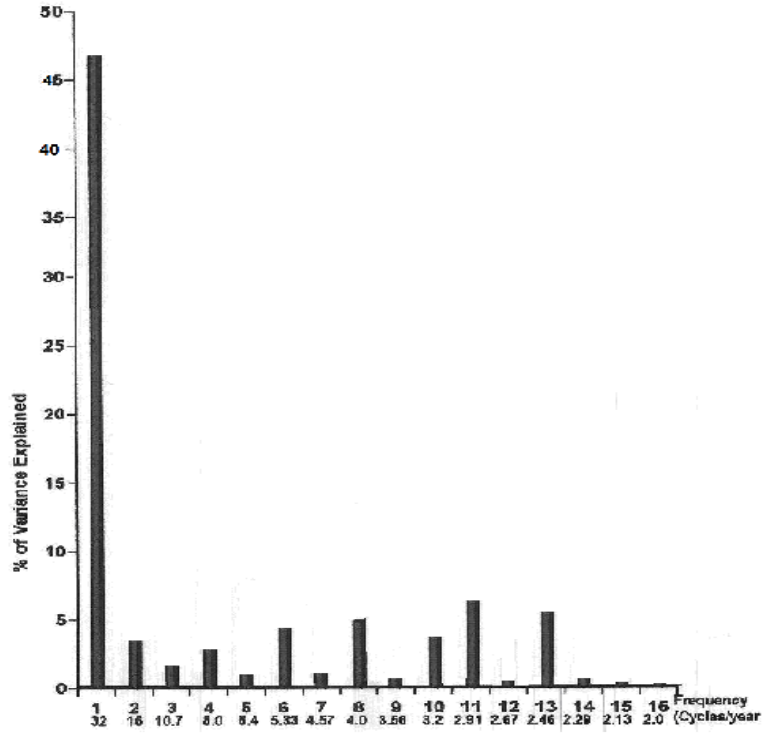


Fig. 3.10: Variance Spectrum for Ikeja Local Government Area on the number of Deaths from road traffic accidents.

Table 3.2: Analysis of variance for reported number of fatalities from road traffic accidents in Lagos state.

Factor	Sources of variation	Sum of squares	Degree of freedom	Mean square	F.Cal.	F.Tab
LGAs	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			

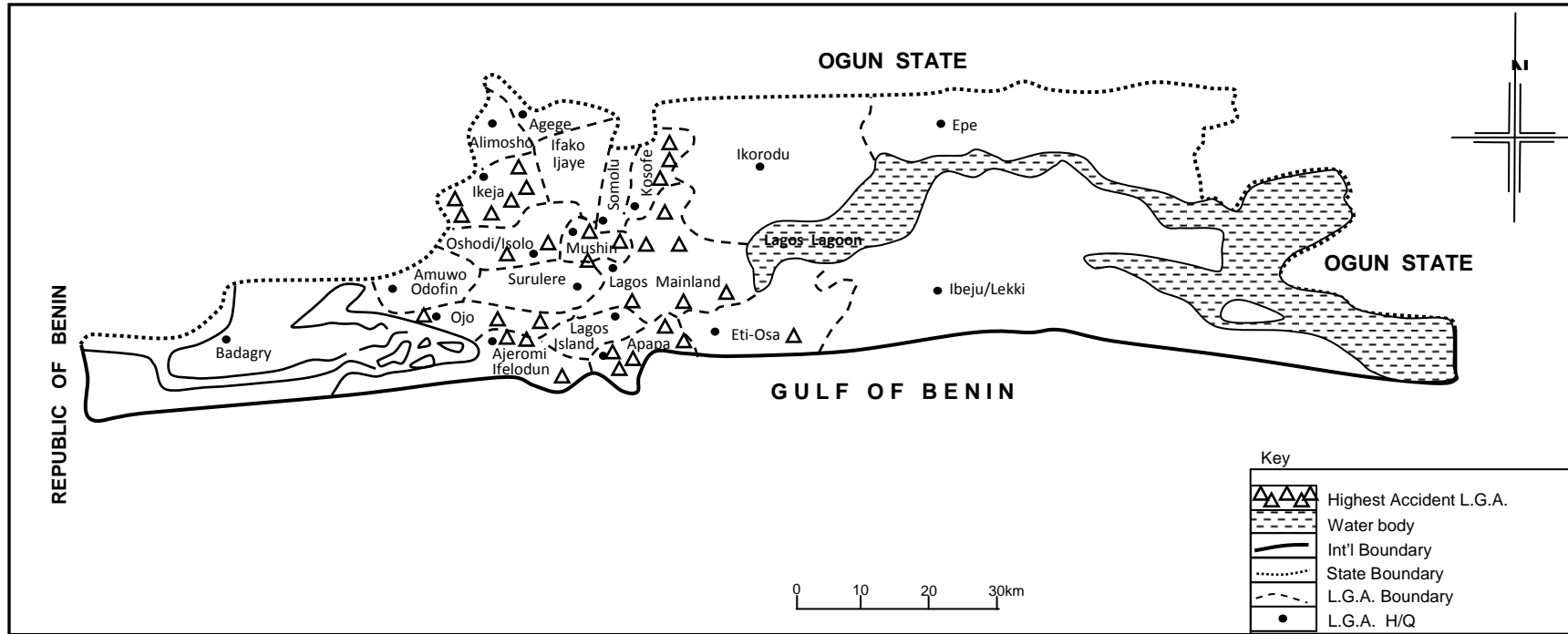


Fig. 3.11: Spatial distribution of highest accident LGAs in Lagos State

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.

One area where stakeholders could focus on to work with government, would be the improvement of the roads and adjacent road space. The general condition of roads is poor, with potholes and all sorts of obstacles in the way. It is common to see animals on the rural roads, as well as children using them as play grounds. In the urban setting there is a general misuse of the roads. Vehicles are often inadequately parked. In some places, sidewalks do not exist, forcing people to walk on the road. Root causes of the problem are the general lack of education about safe driving and walking, and the inadequate road infrastructure.

Conclusion

Improvement of injury surveillance systems is needed to help make road traffic safety a national development agenda priority and for developing and implementing road safety polices. For road safety programmes to be effective, government must facilitate stakeholders involvement and the clear definition of government activities, civil society activities and public – private partnerships need to be established.

References

- Afukaar, F.K. (2003), "Speed Control in developing countries: Issues, challenges and opportunities in reducing road traffic injuries," *Injury Control and Safety Promotion*, 10: 77-81.
- Atubi, A.O. (2006), "Road Traffic Accident Patterns in Lagos State from 1970-2001," Unpublished Ph.D. Thesis Submitted to the Department of Geography, University of Nigeria, Nsukka.
- Atubi, A.O. (2010a), "Road Transport System management and traffic in Lagos, South Western Nigeria," *Journal of African Research Review*, 4(4): 459-470.
- Atubi, A.O. (2011a), "Road Traffic Accident Patterns in selected Local Government Areas in Lagos State, Nigeria," *Technoscience Review*, 2(1&2): 17-38.
- Atubi, A.O. (2011b), "Contemporary Developments in Road traffic accidents: A Synopsis of Nigeria," *Technoscience Review*, 2(1&2): 39-49.
- Atubi, A.O. (2012c), "Epidemiology of injuries from road traffic accidents in Lagos State, Nigeria," *International Journal of Science and Technology*, 1(2): 56-75.
- Atubi, A.O. (2012d), "Determinants of road traffic accident occurrences in Lagos State: Some Lessons for Nigeria," *International Journal of Humanities and Social Science*, 2(5): 252-259.
- Atubi, A.O. (2012g), "A Fourty-One year review of deaths from road traffic accidents in Lagos State, Nigeria," *Mediterranean Journal of Social Sciences*, 3(3) (In press).
- Atubi, A.O. (2012h), "Variations of Injuries from road traffic accidents in Lagos State; An Analysis of Variance Spectra," *Journal of Alternative Perspective in the Social Sciences* (In press).

- Atubi, A.O. and Onokala, P.C. (2009), "Contemporary Analysis of Variability in Road Traffic Accidents in Lagos State, Nigeria," *Journal of African Geographical Review*, 28: 11-41.
- Daramola, A.Y. (2004, December), "Innovative Options for financing transport infrastructure in Nigeria," In Nisereel, *The Magazine of the Nigerian Institute of Social and Economic Research*, 485, Ibadan.
- Downing, A.J. (1991), "Pedestrian Safety in Developing Countries," *The Vulnerable road user - Proceedings of International Conference on traffic safety*, New Delhi: Macmillan India.
- Filani, M.O. and Gbadamosi, K.T. (2007), "Spatial and Temporal Pattern of Road Traffic Accident Occurrences in Nigeria: 1970-1995," *Nigerian Geographical Journal*, 5 (1): 55-70.
- Jacobs, G.D. Arron-Thomas, A. and Astrop, A. (2000), "Estimating global road fatalities. *TRRL Report 445*. London: Transport Research laboratory.
- Krug, E. (2003), *Injury: A Leading Cause of the global burden of disease*, Geneva: WHO.
- Mock, C. Nil-Amon-Kotey, D. Forjough, S. Rivera, R. (1998), "Epidemiology of transportation related injuries in a sub-Saharan African City," *40th Annual Proceedings of the Association for the Advancement of Automotive Medicines*, 7-9: 171-185.
- Murray, C.J. and Lopez, A. (1996), *The global Burden of diseases, Vol. 1: A Comprehensive assessment of mortality and disability from diseases, injuries and risk factors in 1990 and projected to 2010*, Cambridge: Harvard University Press.
- Nantulya, V. and Reich, M. (2003), "Equity Dimensions of road traffic injuries in low and middle-income countries," *Injury Control and Safety Promotion*; 10(1-2): 13-20.

- Obinna, C. (2007, April 24), "Road traffic crashes kill 0.4 million youths every year, *Vanguard*, A Nigerian daily newspaper, p. 35.
- Omojola, A.S. (2004), "Transport and Communication," in Kayode, M.O. and Usman, Y.B. (eds) *Nigeria Since Independence*, Vol. 2, Ibadan: Heinemann, Pp. 132-152.
- Ross, A. Bagunley, C. Hills, B. McDonald, M. and Silcock, D. (1991), *Towards safer roads in developing countries – A guide for planners and engineers*, IRL, Crowthorne, U.K: Transport Research Laboratories.
- Trinca, G.W. Johnson, L.R. Campbell, B.J. (1988), *Reducing Traffic Injury- A Global Challenge*, Canberra: Royal Australian College of Surgeons.

APPENDIX 1
Reported Number of Deaths

	N	Mean	Std. Dev.	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-Odofin	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

	Min.	Max.
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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-Odofin	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	19.621	.000
Within groups	88227.274	404	218.384		
Total	169639.75	423			

Post Hoc Tests

Homogeneous Subsets

Reported Number of Deaths

Duncan^{a,b}

LGA	N	Subset for alpha = .05				
		1	2	3	4	5
Amuwo-Odofin	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

Reported Number of Deaths
Duncan^{a,b}

LGA	n	Subset for alpha = .05		
		6	7	8
Amuwo-Odofin	13			
Eti-Osa	13			
Kosofe	13			
Ibeju-Lekki	13			
Epe	32			
Alimosho	13			
Ikorodu	32			
Ifako-Ijaye	13			
Badagry	32			
Shomolu	16			
Agege	13			
Ojo	13			
Surulere	16	23.8125		
Osodi/Isolo	16	24.1875		
Apapa	16	27.1250	27.1250	
Mushin	32	30.4375	30.4375	
Lagos Mainland	32	34.5938	34.5938	
Ajeromi	32		35.8750	
Lagos Island	32			52.9063
Ikeja	32			57.0313
Sig.		0.05	0.1060	0.403

Means for groups in homogeneous subsets are displayed.
Uses Harmonic mean sample size = 17.931.

The group sizes are unequal. The harmonic mean of the group sizes is used. Type 1 error levels are not guaranteed.

APPENDIX 2

Reported Number of Fatalities

Year	n	Mean	Std. Dev.	Std. Error	Lower Bound	Upper Bound	Min.	Max.
1970	8	16.7500	6.0651	2.1443	11.6794	21.8206	9.00	26.00
1971	8	16.2500	4.8033	1.6982	12.2344	20.2656	10.00	22.00
1972	8	19.3750	5.7554	2.0349	14.5633	24.1867	11.00	28.00
1973	8	47.2500	24.5575	8.6824	26.7194	67.7806	13.00	78.00
1974	8	30.7500	16.3947	5.7964	17.0437	44.4563	14.00	60.00
1975	8	42.6250	22.9779	8.1239	23.4150	61.8350	13.00	78.00
1976	8	47.2500	22.9953	8.1301	28.0254	66.4746	14.00	80.00
1977	8	40.2500	19.9625	7.0578	23.5610	56.9390	15.00	69.00
1978	8	52.1250	31.9439	11.2939	25.4193	78.8307	19.00	100.00
1979	8	54.8750	25.2668	8.9332	33.7514	75.9986	18.00	89.00
1980	8	60.3750	31.7757	11.2344	33.8098	86.9402	20.00	102.00
1981	8	51.7500	30.5789	10.8113	26.1854	77.3146	19.00	94.00
1982	8	37.1250	13.7989	4.8787	25.5888	48.6612	19.00	53.00
1983	8	32.0000	18.9661	6.7055	16.1439	47.8561	12.00	62.00
1984	8	37.0000	17.1214	6.0533	22.6861	51.3139	16.00	63.00
1985	8	65.3750	38.3813	13.5698	33.2874	97.4626	18.00	105.00
1986	12	38.0833	20.6638	5.9651	24.9542	51.2125	15.00	74.00
1987	12	36.3333	16.2611	4.6942	26.0015	46.6652	20.00	68.00
1988	12	42.0833	24.8284	7.1673	26.3082	57.8585	20.00	91.00
1989	20	24.1000	15.5797	3.4837	16.8085	31.3915	8.00	63.00
1990	20	21.6000	14.5291	3.2488	14.8002	28.3998	6.00	60.00
1991	20	17.2500	5.8298	1.3036	14.5216	19.9784	10.00	32.00
1992	20	16.2500	6.0946	1.3628	13.3976	19.1024	10.00	30.00
1993	20	18.6500	6.8000	1.5205	15.4675	21.8325	8.00	33.00
1994	20	19.4500	8.8703	1.9835	15.2986	23.6014	7.00	36.00
1995	20	18.5500	8.4447	1.8883	14.5978	22.5022	8.00	32.00
1996	20	19.7000	7.0345	1.5730	16.4078	22.9922	10.00	30.00
1997	20	19.4500	8.8999	1.9901	15.2847	23.6153	6.00	34.00
1998	20	17.3000	7.6509	1.7108	13.7193	20.8807	6.00	38.00
1999	20	17.0500	7.2219	1.6149	13.6701	20.4299	8.00	40.00
2000	20	16.5500	9.6925	2.1673	12.0138	21.0862	8.00	50.00
2001	20	22.6000	12.8161	2.8658	16.6019	28.5981	5.00	60.00
Total	424	27.3042	20.0260	0.9725	25.3926	29.2159	5.00	105.00

ANOVA

Reported number of deaths

	Sum of Sq.	Df	Mean Sq.	F	Sign.
Between groups	73716.027	31	2377.936	9.718	.000
Within groups	95923.725	392	244.703		
Total	169639.75	423			

Post Hoc Tests

Homogeneous Subsets