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HOW UNINTENTIONAL INJURIES ON THE NATION'S HIGHWAYS CAN BE AVOIDED OR REDUCED TO THE BEAREST MINIMUM

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ABSTRACT

Death and injury on the nation's highways is a public health crisis, especially for youth and members of selected minority groups. The objective of this paper is to review the literature on behavioral and environmental factors that increase risk for traffic morbidity and mortality in populations at high risk. Each of the following is a risky traffic-related behavior : not wearing seat belts , not using child safety seats , not wearing bicycle or motorcycle helmets , driving after drinking , driving while fatigued or distracted , speeding ,running red lights , and aggressive driving . Environmental factors that modify risk include urban sprawl , highway design , public policy , racism and economic inequality .High risk groups include youths , males , pickup truck drivers , urban dwellers , the elderly , African American , American Indians , Alaska Natives, and Nigeria . A comprehensive approach must be developed for reducing traffic related risk of death and injury, especially in high risk populations.

Keywords: Safety, traffic, injury, mortality, environment, behavior, disparities.

INTRODUCTION

In the year 2002, an estimated number of 42,850 people in the United States were killed motor vehicle crashes, an additional number of 2,914,000 people were injured, and a total number of 4,307,000 motor vehicle crashes resulted in property damage with no injury. Also, in Nigeria up to date an estimated number of 32,000 people were killed through motor accident. Likewise, unintentional injury is the leading cause of death for people under age of 45, and motor vehicle crashes represent the most frequent cause of unintentional injury. For all these reasons, reducing traffic-related morbidity and mortality is a national priority. In this paper, an overview of problems associated with motor vehicle morbidity and mortality in the western world like the United States and in Africa like Nigeria with an emphasis on how these problems disproportionately affect minority and disadvantaged populations. These fundamental questions are addressed: 1) what modifiable behaviors contribute to risk? 2) How do social, cultural, economic, and environmental factors influence risky behaviors? 3) What populations or groups have excess risk?

Behavioral Risk Factors for Motor Vehicle Morbidity and Mortality:

Utilization of Seat Belt: Wearing a shoulder and lap restraint can significantly reduce the risk of severe injury and death for drivers, front seat passengers, and rear seat passengers, particularly for children. The National Highway and Traffic Safety Administration (NHTSA) estimates that shoulder and lap belt use in automobiles reduces the risk of death by 45% and the risk of severe injury by 50% while their use in light trucks lowers the risk of death by 60% and severe injury by 65% . In comparison, air bags reduce the risk of death by only

12%. Seat belt use has also been shown to decrease medical costs associated with accident – related injuries. Over 26 billion dollars in costs could be saved each year if seat belt use were universal .Occupants of the front passenger seat have a similar or even higher risk of dying in motor vehicle crashes than drivers have , a risk that is reduced through the use of air bags and seat belts . (The effectiveness of airbags does not supercede the effectiveness of seat belts; using both is the safest practice.) Although the National Occupant Protection Use Survey (NOPUS) data do not include observations of seat belt use for rear seat passengers, these passengers and the front seat passengers are safer when back seat passengers wear restraints. In the United States the use of seat belt has improved dramatically over the past 10 years, but remains below 80%. In the year 2002, the national rate of seat belt use, estimated from observational surveys in all 50 states, reached 75% overall and 80% in states with primary seat belt laws (laws allowing a driver to be stopped for not wearing a seat belt). Increasing seat belt use could save thousands of lives each year.

A picture above depicting the need and utilization of seat belts

A picture below shows how a seat belt can be tight in its normal position

Utilization of Child Restraints: The use of restraints in children should occur in 3 stages that are age and / or height dependent. Infants and children under 4 years of age should be restrained in a child car seat. Children 4-8 years old should graduate to a booster seat that allows shoulder and seat belts to be used more safely. Small children restrained only by shoulder and lap belts designed for adults are at risk for head, face, spinal, and abdominal injuries. After age of 8, or when the child is taller than 145 cm (57 inches), the child should graduate to an adult seat belt .If properly installed safety seats can reduce mortality 70% in infants and 50% in toddlers, while injuries requiring hospitalization are reduced by 69% in children 4 years old and younger.

A 1995 study by NHTSA checked safety seat use and installation in shopping center parking lots in 4 states and showed that the rates of safety seat use were 96% for instants (20 pounds and under) , 68% for toddlers (20-40 pounds) , and 6% for preschoolers (40-60 pounds). When installation and use of the seat were examined, 80% were not being used properly. There was a strong relationship between the driver's use of seat belts and child restraint; if the driver was unrestrained, 47% of the children were unrestrained. Lap and shoulder belts were designed for adults and do not work well when used with young children because they can not be pulled tight , the lap belt hits the child in the abdomen , and the shoulder harness either does not restrain the child at all or crosses the child at the head or neck . A retrospective study of insurance claims showed that children ages of 2-5 were 3.5

times more likely to suffer significant injury and 4.5 times more likely to suffer head injury if they were using a seat belt instead of a car seat .

A case control study compared people who died while riding in the front seat with those who survived and examined the relationship of air bags to survival. Restrained children in the front seat were not at increased risk (compared with children in cars with no air bag) if an air bag was present, but unrestrained children were 37% more likely than children in cars with no air bag to have been killed if an air bag was present.

Motorcycle and Bicycle Helmets: Motor cycles are a more dangerous mode of transportation than automobiles because there is no structure to protect the driver during a crash. Per mile traveled, drivers are 21 times more likely to be killed on a motorcycle than in an automobile. Helmets offer important protection from fatal and non-fatal head injury when a motorcyclist is involved in an accident. An unprotected rider is 40% more likely to die in an accident than a rider wearing a helmet. In states with mandatory motorcycle helmet laws, compliance with helmet use is nearly 100%. In states without these laws, less than half of all motorcyclists wear a helmet. Mandatory helmet laws have been weakened in several states in recent years with a corresponding increase in rates of motorcycle fatalities in these states. While this is rare compared with motor vehicle deaths, bicyclists are sometimes killed on the nation's roads and highways. In the year 2001, about 728 bicyclists were killed and over 400,000 children are treated in emergency rooms for bicycle-related injuries. Bicycle helmets

are estimated to reduce head injuries by 88% in bicycle accidents. Universal use of bicycle helmets among children 4-15 years old could prevent over 40,000 head injuries each year.

Drinking and Driving: Driving after consuming alcohol long has been a problem in the United States and continues to be a serious public health issue .In the year 2000 , there were over 2 million alcohol-related vehicle crashes killing 16,792 people , injuring over 500,000 , and costing over 114 billion dollars in direct and indirect costs . It is estimated that alcohol use when the driver's blood alcohol level (BAL) is above 0.10% contributed to the cause of 91% of these alcohol-related crashes . Alcohol use ranks as a contributing factor in only 24% of crashes when BAL is below o.o8%. Alcohol-related crashes are a bigger problem with younger drivers; one third of all fatal crashes involving alcohol also involved 21-24 year old drivers. In 2001, 25% of drivers 16-20 years old involved in fatal crashes were intoxicated. Alcohol involvement in fatal and non fatal crashes is more common among young males than young females. Alcohol use is also associated with lower rates of seat belt use in youth involved in motor vehicle crashes. The National Highway Traffic and Safety Administration conducted a nationally representative telephone survey of 6,002 individuals aged 16 and older, examining attitudes, beliefs, and behaviors associated with drinking driving. Although 77% of respondents viewed drinking and driving as a threat to their personal safety, 23% of respondents admitted to driving within 2 hours of consuming alcohol during the previous year, with more males (32%) admitting to drinking and driving than females (13%). Rates of drinking and driving are higher among young adults (21-29), with 37% of males and 20% of females admitting to drinking and driving. While 37% of males in the 20-45 age groups continue to drink and drive, the rate drops to 16% for females in this age group. The National Highway Traffic Safety Administration estimates that about 11% of the time individuals who drive after drinking have blood alcohol levels above 0.08% , resulting in over 94 million episodes of driving while intoxicated per year in the United States . Approximately one of every three drivers arrested for intoxication is a repeat offender. Repeat offenders are more likely than others to be involved in motor vehicle crashes and, in particular in fatal crashes.

Driver Fatique: While it is difficult to obtain precise prevalence estimates, falling asleep while driving is the cause of as many as 50,000 motor vehicle crashes and 1,500 fatalities per year representing about 3% of all fatalities. Driving between midnight and 6 a.m., driving long distances, consumption of alcohol, and use of certain medications are risk-factors for falling asleep behind the wheel. Three groups are at highest risk: males between ages of 16 and 29, people working night shifts or whose work schedule varies from day to day, and people with undiagnosed sleeping disorders. About 1 of every 3 drivers reports falling asleep at the wheel at least once , and about 4% of drivers report an episode of falling asleep while driving during the previous month . Most drivers, especially those who have fallen asleep behind the wheel, view driving while sleepy as a major public safety hazard.

Driver Distraction: A recent survey by the Gallup Organization examined the prevalence of driver distractions, finding that the most common distractions were the use of electronic devices such as cell phones (60%) , electronic papers (12%) , wireless internet (15%) , and

electronic navigation devices (5%) . O f those with cell phones, about 40% reported either making or taking phone calls while driving, with phone use higher among younger drivers. About 20% of all driving trips involved either taking or making a cellular phone call. Only about 2% of drivers reported using personal digital assistants (PDA) or wireless internet devices while driving and 3% of drivers used a paper while driving. Drivers are 4 times as likely to have a motor vehicle accident while using a cell phone as when they are driving without using the phone. However, some authors suggest that the regulation of cell phone use may not be a cost-effective way to reduce motor vehicle crashes. Other driver distractions and their rate of occurrence included talking to passengers (83%) , attending to children in the backseat (24%) , eating or drinking while driving (49%) , personal grooming(8%) , looking at maps (12%) , and reading (4%) . About 29% of all driving trips involved eating ,18% dealing with children , 10% reading maps , 8% grooming, ,and 7% reading books or newspapers . It is not entirely clear how each of these behaviors contributes to crash risk, but a number of studies clearly show that distraction cell phones, attention to electronic devices, and verbal exchanges interfere with a driver's ability to respond quickly to road hazards.

Risky Driving Behaviors: At least 3 sets of driving behaviors can increase the risk of motor vehicle crashes: 1) running red lights, 2) exceeding the posted speed limit, and 3) aggressive driving. About 40% of all crashes occur at intersections. Entering the intersection on the red light either inattentively or deliberately is a major risk factor for intersection crashes. There are over 260,000 crashes associated with running red lights each year , resulting in 750 fatalities Red light running crashes are more dangerous than other types of urban crashes because drivers are often exceeding the speed limit as they enter the intersection . Forty-five percent of red light running crashes are associated with occupant injury. Drivers involved in crashes who run red lights were more likely to be younger, male, using alcohol,, and have a record of previous traffic violations than the other drivers involved in the same crash who did not run the red light . A national survey of drivers showing that 20% of drivers admitted to running red lights on occasion, also found that being in a hurry was the main reason given for running a red light, with very few drivers believing there were any negative consequences for doing so. The likelihood of injury and death in an automobile crash is associated with vehicle speed, especially when a vehicle collides with a pedestrian or bicycle. The cost of motor vehicle crashes in which driver speeding was implicated exceeds 40 billion dollars per year. In the year 1987, U.S. law was changed to allow states to increase speed limits from 55 to 65 miles per hour and several studies demonstrated a corresponding increase in motor vehicle deaths. The problem of speed is compounded by the fact that many drivers, especially teenagers, routinely exceed the posted speed limits. In urban areas , between 40 and 80% of drivers on express ways exceed the speed limit by 10 miles an hour or more .The National Highway Traffic Safety Administration estimates that in the year 2000 , speeding was associated with 30% of all fatal crashes and that speeding-related crashes , on and off interstate highways , cost over 27 billion dollars a year .

Aggressive driving comprises a constellation of behaviors that includes speeding, tailgating, verbally abusive speech, obscene gestures, dangerous maneuvers, and, in rare instances, physical violence. Deffenbacher , et al , identified three clusters of aggressive driving behaviors : 1) verbal expressive aggression , including yelling and cursing at other drivers ; 2) personal physical aggression , including getting out of the car and threatening or fighting another driver , and 3) use of the vehicle to express anger , such as flashing lights or cutting in front of another driver . The base rate of some of the behaviors (such as speeding, running red lights and stop signs, and tailgating) is high in urban areas. A small number of drivers engage invery risky aggressive behaviors and may do violence to other motorists when anger is combined with a desire for vengeance. Aggressive driving and other risky driving behaviors may be associated with personality characteristics such as sensation-seeking that might motivate risk-taking behind the wheel. More research is needed to determine the extent to which aggressive driving influences the risk of motor vehicle accidents.

FATALITIES IN NIGERIA

The distribution of total Road Traffic Accident Casualties by states in Nigeria is as shown in table 1.0. The distribution of the accident casualties has been divided into 3 groups based on the percentage of total casualties recorded by each state. The groupings are as shown on table 2.0. Group A comprise of states with percentage score of Road Traffic Accident Casualties ranging from 0, 00-2.99 per cent. Group B comprises of states with percentage score of between 3.00-5.99 per cent while group C comprises of states with percentage score of between 6.00-8.99 per cent. The states that fall within group A are Abia , Adamawa , Akwa Ibom ,Anambra , Bayelsa , Borno , Delta , Ebonyi , Edo , Ekiti , Enugu , Gombe , Imo , Jigawa , Kebbi , Kogi ,Kwara , Federal Capital-Abuja . These states can be ranked as comparatively recording low level of total Road Traffic Accident Casualties in the country. Group B comprises of Bauchi, Cross River, Kano, Katsina, Lagos, Ondo ,Osun ,Oyo , and Plateau States . These states could be ranked as recording a relatively medium level of Road Traffic Accident Casualties. Group C comprises of Benue, Kaduna and Ogun states. These states standout as recording high level of Road Traffic Accident Casualties in Nigeria.

Figure 1 shows the distribution of Road Traffic Accident casualties by states

TABLE 1.0: Statistics on Road Accident casualties in Nigeria (2004 - 2007)

State	Total Population in Millions	Total No. of Accidents	Casualties						Length of Roads in Kms	Total No. of Registered Vehicles
			Total No. of Casualties	%	No. of Deaths	%	No. Injured	%		
Abia	2.83	689	1056	0.96	394	1.10	662	0.89	607	156,779
Adamawa	3.17	2,215	2875	2.61	782	2.19	2,093	2.81	1,316	
Akwa Ibom	3.92	2,323	3077	2.79	1145	3.21	1,932	2.60	601.9	62,317
Anambra	4.38	947	905	0.90	361	1.01	634	0.85	554.4	74,770
Bauchi	4.68	1,687	3691	3.35	1235	3.36	2,456	3.30	1,280	
Bayelsa	1.70	755	794	0.72	199	0.56	595	0.80	167.8	10,783
Benue	4.22	4,119	6765	6.14	1864	5.23	4,901	6.53	1,611	
Borno	4.85	1,267	1980	1.80	518	1.45	1,462	1.92	2,207	
Cross River	2.89	2,487	3886	3.62	1140	3.20	2,746	3.33	1,075.19	19,505
Delta	4.10	2,225	2819	2.56	855	2.40	1,964	2.64	732.5	
Ebonyi	2.17	1,196	2060	1.87	480	1.35	1,580	2.12	502.8	23,516
Edo	3.22	2,892	2674	2.43	687	1.93	1,987	2.67	916.5	34,729
Ekiti	2.38	977	1355	1.23	304	0.85	1,051	1.41	367	12,963
Enugu	3.26	2,673	2179	1.98	821	2.30	1,358	1.82	858	
Gombe	2.35	1,057	2201	2.00	965	2.71	1,236	1.66	499	2,500
Imo	3.98	1,197	1589	1.44	634	1.79	955	1.28	599.5	28,043
Jigawa	4.35	764	1114	1.06	355	1.01	759	1.02	751	

Kaduna	6.09	3,210	9643	8.75	3,763	10.55	5,880	7.65	1,688	31,585
Kano	9.38	4,031	4008	3.64	1,237	3.47	2,771	3.72	908.5	52,515
Katsina	5.79	1,668	3819	3.46	1,204	3.84	2,615	3.51	842	27,415
Kebbi	3.24	847	1081	0.98	280	0.79	801	1.08	862.4	119,607
Kogi	3.28	1,137	1670	1.51	693	1.74	977	1.31	1,133	
Kwara	2.37	876	1761	1.60	507	1.42	1,254	1.68	1,044	47,212
Lagos	9.01	4,540	5120	4.64	1,807	5.07	3,313	4.45	675.9	527,484
Nassarawa	1.86	733	1823	1.65	602	1.59	1,221	1.64	887	
Niger	3.95	1,023	1954	1.77	739	2.07	1,215	1.63	2,177.2	27,689
Ogun	3.73	5,964	9622	8.73	2,975	8.35	6,647	8.93	1,071.8	7,906
Ondo	3.44	2,047	3377	3.06	999	2.80	2,378	3.20	724.4	14,364
Osun	3.42	3,414	5558	5.04	1,431	4.01	4,127	5.55	628.5	30,071
Oyo	5.59	4,740	5046	4.58	1,532	4.30	3,514	4.72	1,060.5	14,232
Plateau	3.18	2,905	4059	3.68	1,420	3.98	2,639	3.55	979.3	43,799
Rivers	5.16	2,666	2438	2.21	674	1.55	1,764	2.37	657	
Sokoto	3.70	668	844	0.77	549	1.34	295	0.40	582	40,440
Taraba	3.02	908	1264	1.15	322	0.90	942	1.27	1,624	7,201
Yobe	2.32	1,011	2410	2.19	797	2.20	1,613	2.17	877.4	57,334
Zamfara	3.26	451	723	0.66	151	0.42	572	0.77	1,035	26,702
FCT	1.47	2,506	2930	2.66	1,041	2.92	1,889	3.54	236.6	
Total	141.71	74,815	110170		35,462		74,798		34,341.05	1,501,461

Sources: Nigerian Police Force Headquarters; Federal Road Safety Commission; National Population Commission; National Bureau of Statistics; Federal Ministry

Table 2: Summary Grouping of States on Road Traffic Accident Casualties

Group	**Rank**	**States**
A	Low (0.00-2.99%)	**Abia,Adamawa, Akwa Ibom, Anambra,Bayelsa, Borno, Delta, Ebonyi, Edo, Enugu, Gombe, Imo, Jigawa, Kebbi, Kogi, Kwara, Nasarawa, Niger, Rivers, Sokoto, Taraba, Yobe, Zamfara, Federal Capital Territory**
B	Medum **(3.00-.995%)**	Bauchi,CrossRiver,Kano,Katsina,Lagos, Ondo, Osun, Oyo,Plateau
C	High (6.00-8.99)	Benue, Kaduna, Ogun

Source: Author's Analysis of Table 1.0

Pattern of Motor Vehicle Deaths

The distribution of motor vehicle deaths by states in Nigeria is also shown on table 1 . The distribution has been divided into 4 groups based also on the severity of total deaths recorded by the states. The groupings are as shown on table 3.0. Group A comprises of Abia, Adamawa, Anambra, Bayelsa, Borno, Delta, Ebonyi, Edo, Ekiti, Enugu, Gombe, Imo, Jigawa, Kebbi, Kogi, Kwara, Nasarawa, Nger, Ondo, Rivers, Sokoto, Taraba, Yobe, Zamfara States and Federal Capital Territory . These states can be ranked as recording relatively low level of motor vehicle deaths in the country. Group B comprises of Akwa Ibom, Bauchi, Benue, Cross River, Kano, Katsina, Lagos,Osun, Oyo and Plateau States . The states can be ranked as recording relatively medium level of motor vehicle deaths in the country. Group C comprises of Benue and Ogun States and these states can be ranked as recording relatively high level of motorvehicle deaths in the country. The fourth group is Group D comprising only of

Kaduna state which can singularly be ranked as the only state with relatively very high level of motor vehicle deaths in the country. Figure 3.0 shows the spatial distribution of motor vehicle deaths by states in the country.

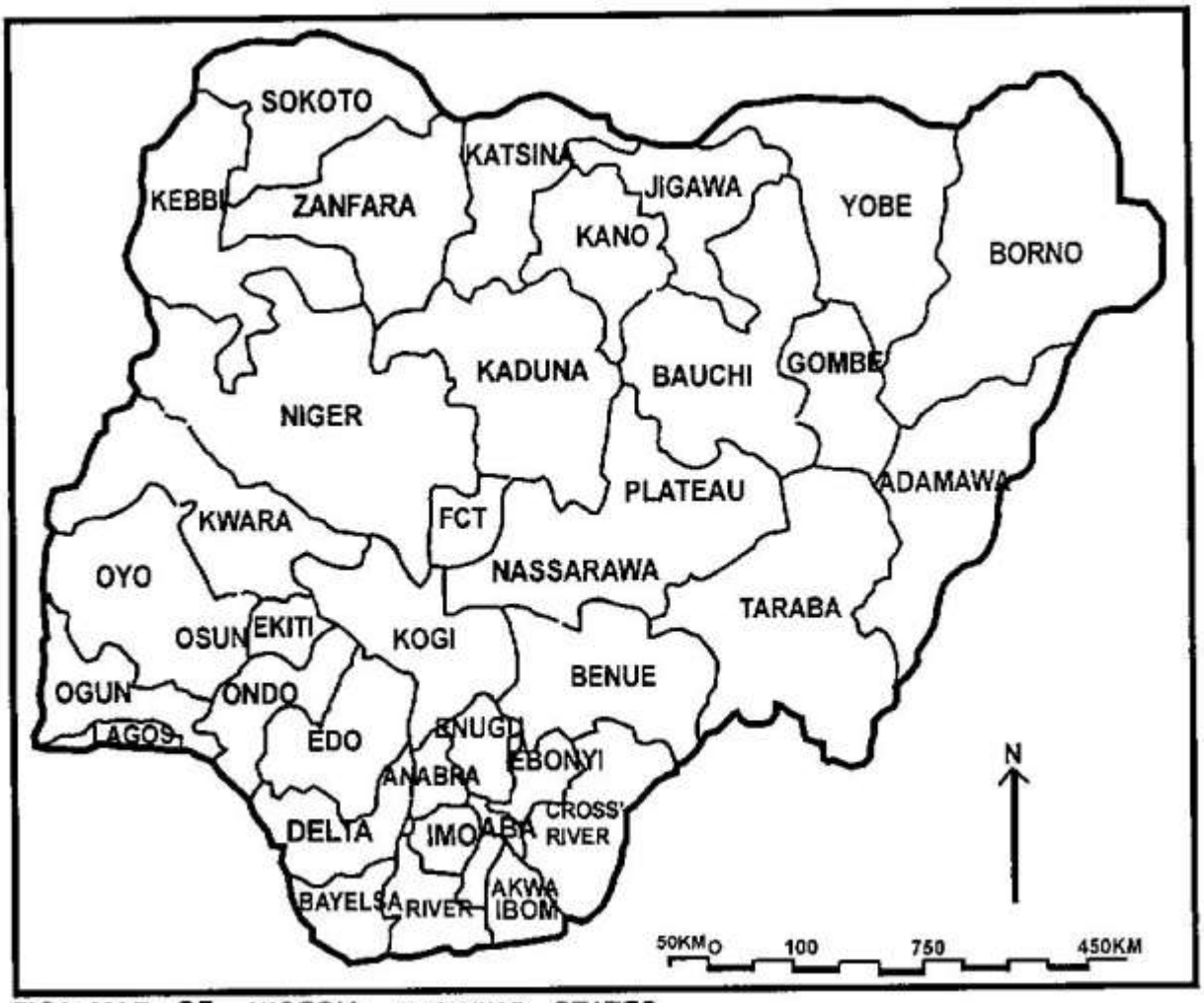

FIG1: MAP OF NIGERIA SHOWING STATES

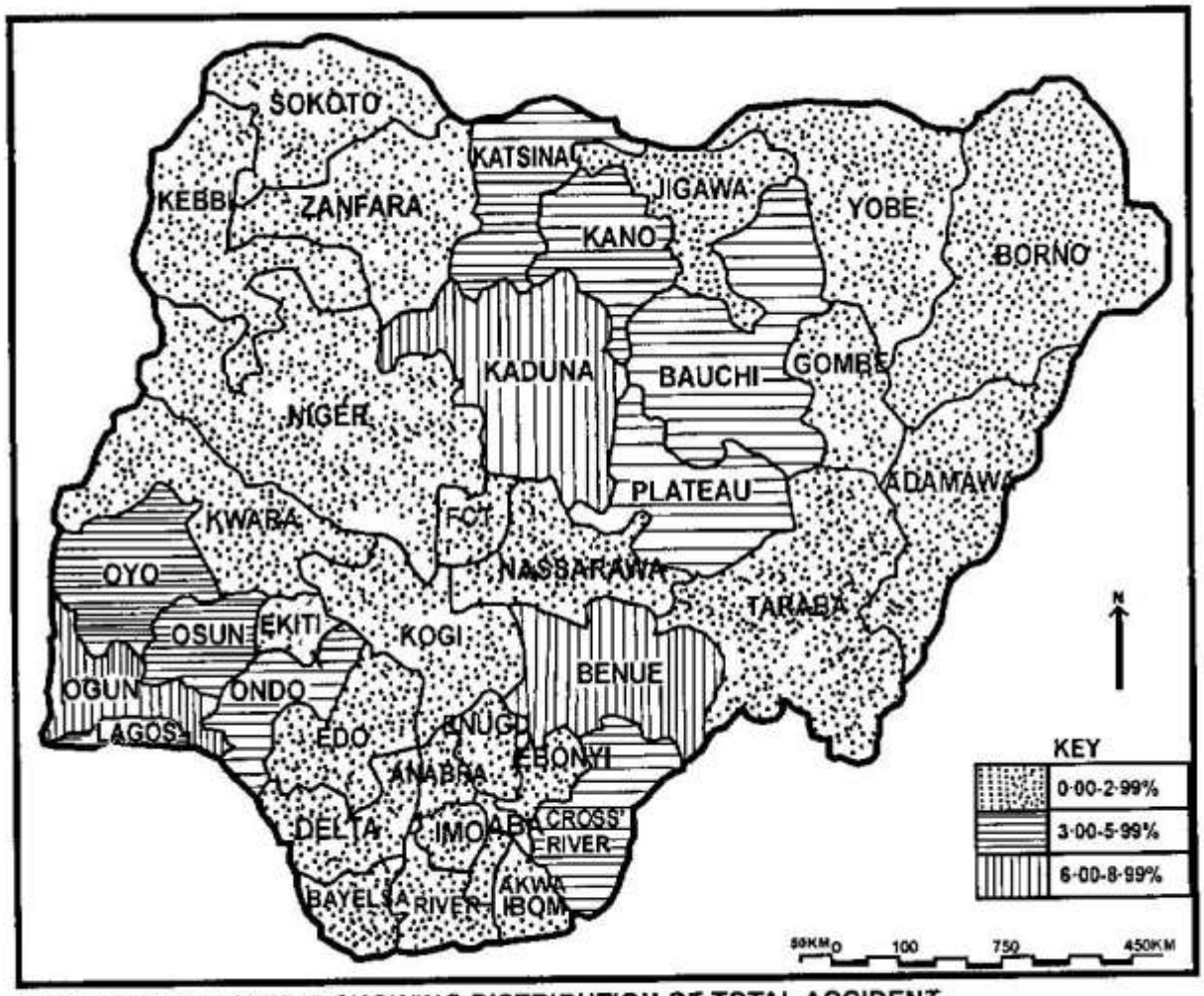

FIG2: MAP OF NIGERIA SHOWING DISTRIBUTION OF TOTAL ACCIDENT CASUALTIES BY STATES (2004-2007)

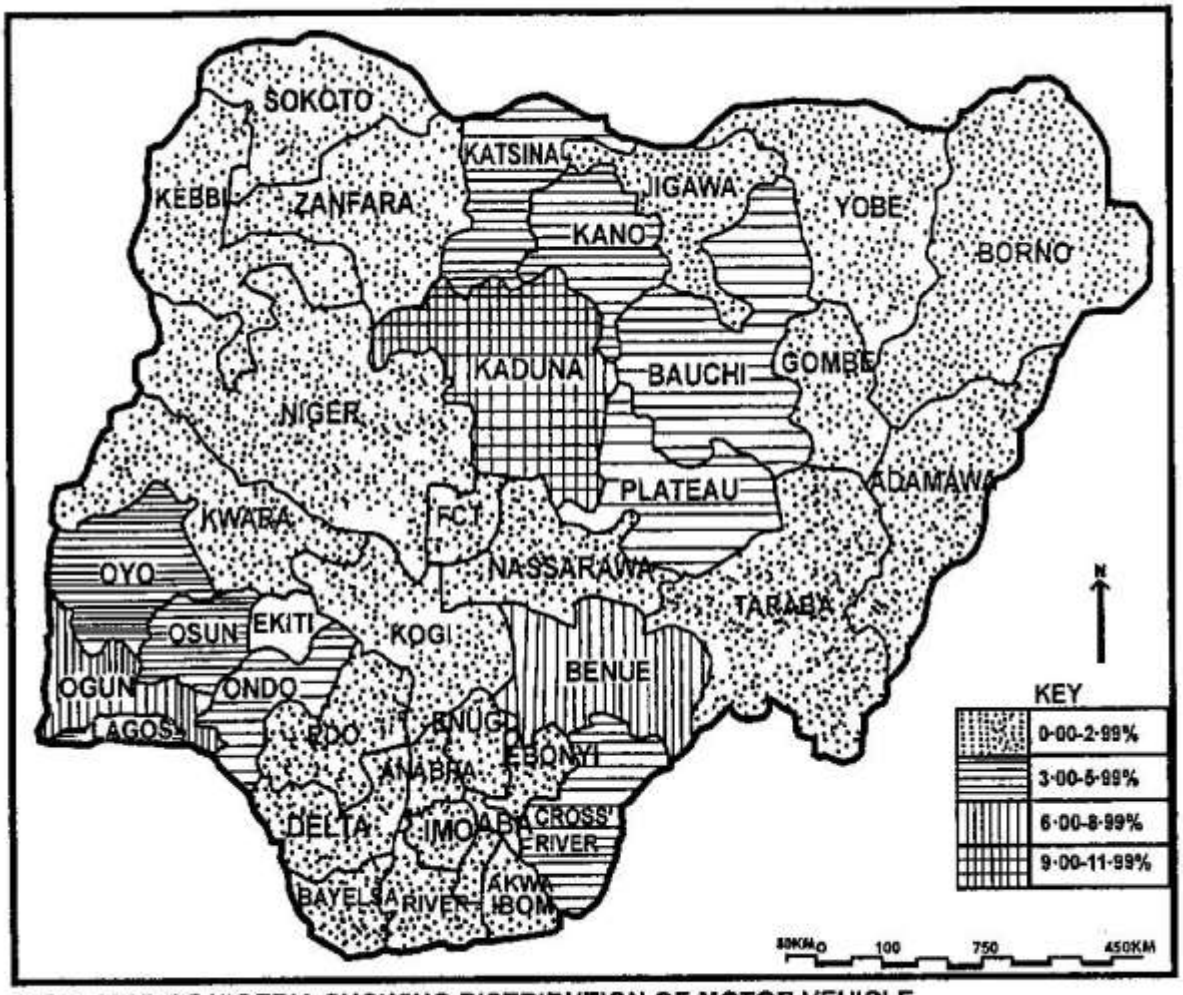

FIG3: MAP OF NIGERIA SHOWING DISTRIBUTION OF MOTOR VEHICLE DEATHS BY STATES (2004-2007)

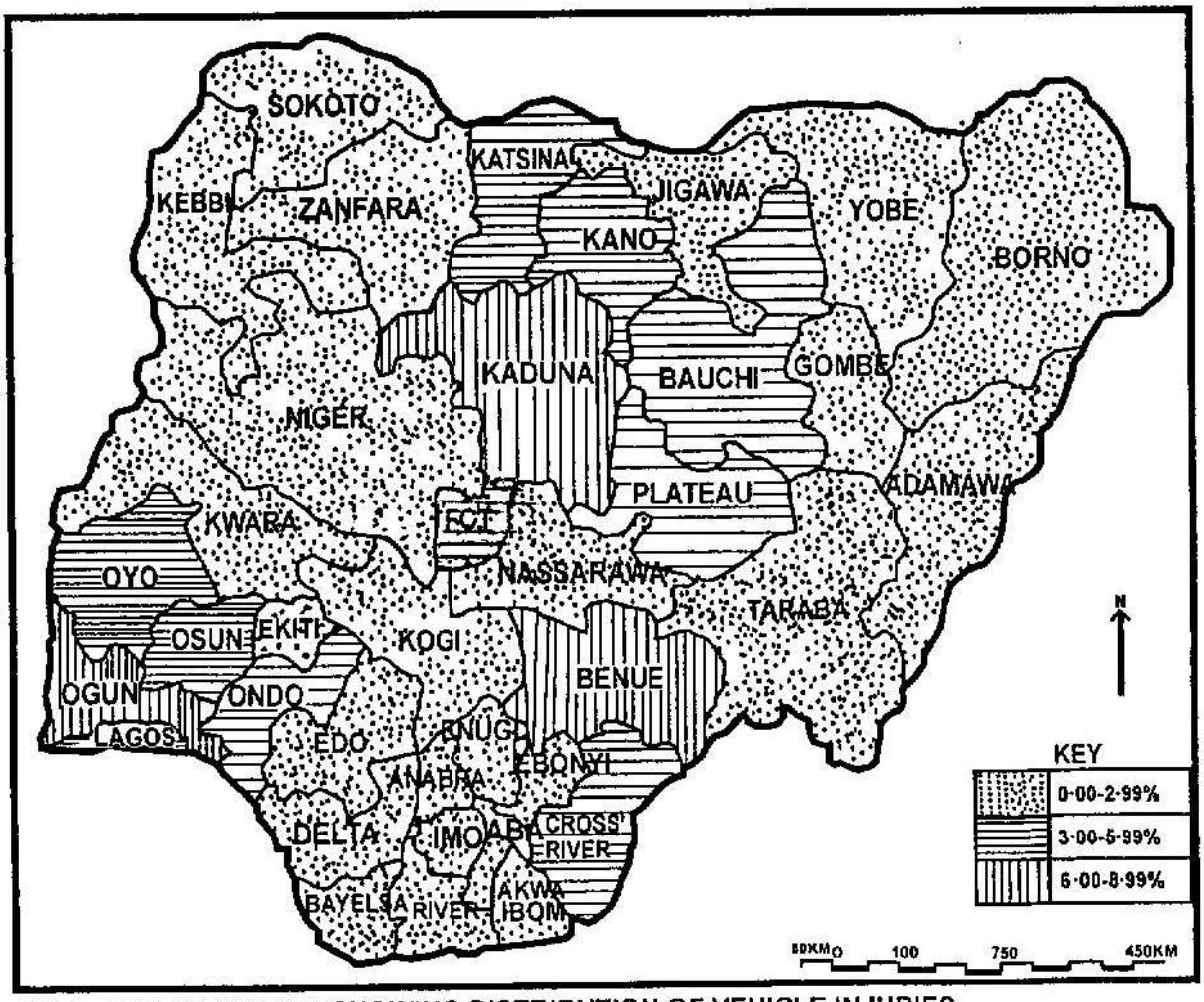

FIG4: MAP OF NIGERIA SHOWING DISTRIBUTION OF VEHICLE INJURIES BY STATES (2004-2007)

Table 3 : Summary Grouping of States on Severity of Motor Vehicle Deaths

Group	Rank	States
A	Low (0.00-2.99%)	Abia, Adamawa, Anambra, Bayelsa, Borno, Delta, Ebonyi, Edo,Ekiti,Enugu,Gombe, Imo,Jigawa,Kebbi,Kogi,Kwara,Nasarawa,Niger,Ondo,Rivers,Sokoto,Taraba,Yobe ,Zamfara,Federal Capital Territory .
B	Medium (3.00-5.99%)	Akwa Ibom,Bauchi,Cross River, Kano, Katsina, Lagos, Osun,Oyo,Plateau.
C	High (6.00-8.99%)	Benue,Ogun .
D	VeryHigh(9.00-11.99%)	Kaduna

For Table 3 obtain Source Author's Analysis of Table 1.0

Pattern of Motor Vehicle Injuries

The pattern of distribution of motor vehicle injuries by states in the country is also as shown on table 1.0. The distribution can be grouped into 3 categories based on the severity of motor vehicle injuries recorded by the states. Group A comprises of Abia , Adamawa, Akwa Ibom, Anambra, Bayelsa, Borno, Delta, Ebonyi, Edo, Ekiti, Enugu, Gombe, Imo, Jigawa, Kebbi, Kogi, Kwara, Nasarawa, Niger, Rivers, Sokoto, Taraba, Yobe, and Zamfara States . These states can be ranked as recording relatively low level of motor vehicle injuries in the country. Group B comprises of Bauchi, Cross River, Kano, Katsina, Lagos, Ondo, Osun, Oyo, Plateau States and the Federal Capital Territory. They can be ranked as recording relatively medium level of motor vehicle injuries in the country. Group C comprises of Benue, Kaduna, and Ogun States and can be ranked as recording relatively high level of motor vehicle injuries in the country. Table 4.0 shows the summary groupings of the severity of motor vehicle injuries by states while figure 4.0 shows the spatial pattern of the distribution.

Environmental Factors Associated with Traffic Morbidity and Mortality

Highway infrastructure, Urban Sprawl, and the design of transportation systems. Specific design features of the transportation infrastructure in the united states and elsewhere are associated with risk of motor vehicle accidents .Urban Sprawl, the trend of the past 50 years for urban centres to expand out from the central city to encompass several rings of suburban development all interconnected by roads and expressways, has reshaped the American landscape in the second half of the 20^{th} century. A recent study showed a direct association between urban sprawl and the likelihood of fatal motor vehicle crashes. About one third of all motor vehicle deaths are associated with crashing into roadside hazards such as trees, utility poles, bridges, and other objects that are fixed in place.

State Traffic Laws and Law Enforcement

The two most effective strategies for increasing seat belt use have been the passage of primary seat belt Laws and campaigns to enforce these laws and publicize their enforcement. Primary seat belt laws allows a law enforcement officer to stop and ticket a driver for not wearing a seat belt. Secondary seat belt laws allows drivers to be ticked for not wearing a seat belt, but only if they were stooped for some other reason. In states with primary seat belt laws, rates of seat belt use among African Americans are equal to those among non-Hispanic whites. However, the introduction of a primary seat belt law does not necessarily mean that rates of seat belt use will rise. State and local law enforcement agencies differ in the degree to which they are willing and able to allocate resources to enforcing seat belt and car safety seat belt laws.

African Americans, American Indians, and Alaska Natives

An analysis of mortality data from 1993-1995 suggested that African Americans involved in fatal traffic crashes were more likely than non- Hispanic whites to be restrained . Another recent study compared rates of seat belt use among motor vehicle crash victims and showed that differences in rates of seat belt use between African Americans and non-Hispanic whites were greater in states with secondary seat belt laws. In a secondary seat belt law state, only

21% of Arican Americans were wearing aseat belt at the time of the accident (compared with 42% of non-Hispanic whites). American Indians have higher mortality rates and injury rates in motor vehicle crashes then do non-Hispanic whites living in the same state. Similar findings have been reported for pedestrians, with death rates among American Indian pedestrians being 3to 4 times higher than among white pedestrians in Arizona. American Indian and Alaska Native youth also are at higher risk than non- Hispanic whites for unintentional injury and death from other causes besides motor vehicles. Motor vehicle crashes are the 3rd leading cause of death for American Indian males (compared with 7th for non-Hispanic white males) and the 5th leading cause of death for American Indian women (compared with 10th for white women) .

There are racial and ethnic disparities within some of the other identified high-risk subgroups. The CDC reports that African American students are more likely than Caucasian students to report not using a seat belt, with African American females reporting lowest rates of seat belt use. Secondly, urban areas are where racial/ethnic minority groups, especially African Americans, live in the greatest concentrations. An analysis of the 2002 NOPUS observations of African Americans in urban areas showed that only 63% were wearing seat belts compared with an overall U.S. rate of 77% for African Americans. Using parking lot observations of a convenience sample of African Americans visiting community health centers in four communities, driver rates of seat belt use were 57% and passenger rates were 52%. Finally, rates of dying in motor vehicle crashes among the elderly in the U.S. are higher in minority populations. Among pedestrians, death rates by ethnic group differ depending upon whether or not the population is urban or rural, with minorities at higher risk in urban areas. Little information is available about racial and ethnic differences in drinking and driving. Among college students, non-Hispanic whites are 2.1 times more likely to report drinking and driving than none—Hispanic blacks. Patterns of alcohol use in the United States are a complex function of age, gender, and ethnicity. Heavy alcohol use is more common among young non-Hispanic white males than other racial/ethnic groups, while problem drinking patterns emerge in the 25-45 age groups more often among Hispanic and African American males than among non-Hispanic white males.

SUMMARY

Scientific research has identified a number of behaviors that increase one's risk for being injured or killed in a motor vehicle . Specific behaviors such as using seat belts and child car seats , wearing helmets , avoiding drinking and driving , minimizing driver fatigue and distraction, and obeying traffic laws and driving courteously have already been adopted by large segments of the population . If adopted by even more people , these behaviors could greatly reduce the human and economic toll of motor vehicle crashes . The risk of injury and death in vehicle crashes are not uniformly distributed across the population . Young people , pickup tuck drivers , inner city residents , the elderly , African Americans , and Native Americans are groups at particularly high risk .

In some cases , the association between high-risk groups and risky behaviors (e.g. ,inner city African Americans having lower rates of seat belt use ; young males driving more

aggressively) is known , while in other instances more research is needed . In addition, specific environmental factors such as urban sprawl, highway design, public policy, and laws contribute to risk. Disparities in risk between racial/ethnic groups are complex and dealing with them must involve consideration of the deeper underlying causes (including segregation, racism, discrimination, and unequal access to social and economic resources). The field of traffic safety has an impressive infrastructure to monitor morbidity and mortality associated with seat belt use. Surveillance systems are in place tracking all traffic fatalities , sampling non- fatal traffic accidents , and monitoring seatbelt use nationwide by means of observational and self- report methodologies . In addition, other large data sets such as the hospital discharge data base and other sources of data on injury such as the CDC's web-based Injury Statistics Query and Reporting System (WISQARS) give scientists the ability to track changes and trends. While surveillance systems could be improved by tracking additional risky behaviors such as not earing helmets while biking and using cell phones while driving, a large amount of useful data is being regularly collected and analyzed. There is clearly a commitment at the National Highway Traffic Safety Administration and among non-governmental groups to find ways to make it safer to drive, walk, and cycle on or next to the roads in the U.S.

The study of fatalities spatial distribution in Nigeria shows of road traffic accident casualties in the country within the study period of 2004-2007. The results show that total road traffic accidents, population estimate, road lengths and number of registered vehicles are important variables to take into consideration in examining road traffic accident casualties in the country

In order to curtail road traffic accidents on Nigerian roads, the following recommendations are pertinent:

1. Drivers should be trained and retrained as a means of effectively dealing with road traffic accident reduction.
2. Motorists should drive within speed limits and with a speed consistent with road conditions.
3. Motorists should not drink and drive and should comply with the legislation on speed limits.
4. Seat belts should be worn by motorists for both short and long trips.
5. First aid kit should be provided in every vehicle and emergency first aid facilities should be made available for accident casualties.
6. Road safety education should be part of the curriculum in our educational institutions.
7. Traffic laws must be judiciously enforced by the various law enforcement agencies in the country.

Advancing our understanding of risky behaviors and how psychosocial and environmental factors influence these behaviors is the most urgent priority. Better models integrating theory and data from the environmental and social sciences are needed to further our understanding of risk and of why some populations are at higher risk than others. Finally, an enhanced understanding of risky behavior must be translated into strategies for individual,

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