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SCHOOL OF MEDICINE
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**A DESCRIPTIVE EPIDEMIOLOGICAL STUDY OF ROAD TRAFFIC
ACCIDENTS IN LUSAKA (OCTOBER 1996 - JANUARY 1997)**

BY

DR. RODWELL KAFULA

**A dissertation submitted to the University of Zambia in
partial fulfilment of the requirements for
Master of Public Health.**

255675

(School of Medicine)

The University of Zambia

Lusaka

1996/97

1.0 COPYRIGHT DECLARATION

This dissertation represents my own work. It has not previously been submitted for a degree at this or another university.

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2.0 DEDICATION

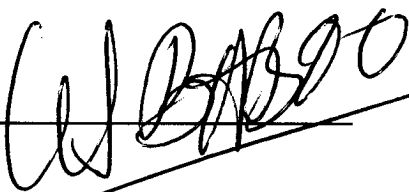
This study is dedicated to my wife Ethel Mukondola Kafula and my children Willie and Mwansa for their understanding, support and tolerance during the time of doing this work.

3.0 EXAMINER'S APPROVAL

This dissertation by Dr. Rodwell Kafula is approved in partial fulfilment of the requirements for the award of the Masters of Public Health by the University of Zambia.

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4.0 **ABSTRACT**

Justification of the Study: Road traffic accidents are a major cause of morbidity and mortality in Zambia.

Objective: The objective of this study was to identify major risk factors in road traffic accidents in Lusaka in the last three months of 1996.

Study Design: The study was conducted in two stages:-

- (i) Stage one was the main study that was conducted between October 12th, 1996 and January 11th, 1997 at the University Teaching Hospital.
- (ii) In stage two the records from Road Safety Council, Zambia State Insurance Corporation, Meteorological Department and Zambia Police Service were analysed to collect necessary information about road traffic accidents. This was supplemented by conducting interviews with key persons from the above mentioned institutions.

Setting: Data was collected by administering a questionnaire to patients at the casualty and surgical wards of the University Teaching Hospital, Lusaka.

Subjects: A total of 385 patients were interviewed and questioned after getting permission from authorised personnel.

Results: There were 385 victims admitted in this time who met the criteria of the investigation. Data was obtained on 371. Most accidents occurred in 21-30 age group for both males and females as shown in Table 2. Younger people were more prone to road traffic accidents than older group. There was an increase of road traffic accidents on Fridays and on weekends, especially Saturdays. This increase was also observed from Mondays to Wednesdays as shown in Figure 5. Twenty-four hour

time frequency (Figure 6) shows majority of accidents occurred between 15.00 hours and 18.00 hours. Table 7 shows a clear role of high excess speed in road traffic accidents. Influence of alcohol and bad roads were some of the other causes of road traffic accidents. The majority of accidents could have been avoided. (Table 8). In three months 1,097 accidents took place in Lusaka, involving nearly 2000 victims, of which 334 were injured. Of the injured victims 143 (42.8 percent) had slight injuries, 134 (40.1 percent) had serious injuries and 57 (17.1 percent) died on the spot. (Table 9). Mortality among those driving cars was higher than other categories of drivers.

Conclusion: There are multiple factors responsible for road traffic accidents. This study confirms some of the known risk factors. Even though road traffic accidents inflict pain and misery on many lives and are responsible for property damage and loss, little has been done by the government or authorities concerned. The country as a whole has yet to compile accurate statistics on road traffic accidents.

5.0 ACKNOWLEDGEMENTS

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Lastly but not the least, I am thankful to Mr G. Mutale of the University Teaching Hospital for his assistance and Ms G. Musonda of Kitwe City Council whose tireless effort in typing this manuscript was of great help. Finally, I thank Kitwe City Council for supporting this study.

DR. R. KAFULA

27/02/97

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6.1 ABBREVIATIONS

1. AIDS Acquired Immune Deficiency Syndrome
2. BID Brought-in-Dead
3. CDC Centres for Disease Control and Prevention
4. HIV Human Immuno-deficiency Virus
7. MPH Master of Public Health
6. OR Odds Ratio
7. UTH University Teaching Hospital
8. UK United Kingdom
9. UNZA University of Zambia
10. WHO World Health Organisation
11. X^2 Chi-square
12. ZP Zambia Police
13. ZSIC Zambia State Insurance Corporation

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6.4 CONTENT OF INSIDE BACK COVER POCKET

Map of Lusaka, showing: main roads, residential areas, freedom statue, etc.

7. INTRODUCTION

7.1 Background Information:

Lusaka is the capital city of Zambia. Its population has gradually increased from 997,107 in 1990 to 1,149,290 in 1996 at a growth rate of 5.09 percent. (Census, 1990). Like any other city in Sub Sahara Africa it is a city under construction. The concrete skeletons of new office blocks and mushrooming of shapeless structures dominate the city. Illegal and legal shanty compounds and unsightly market stands litter every entrance to the city. The national economic decline over the past decade has led to deterioration of infrastructure and services which had been a major concern to the current government. (Strategic Health Plan for Lusaka Urban District, 1995). Natural population increase and in-migration increase has worsened the above scenario. It has resulted in increased demand for a better transport system, good roads, competent and well mannered drivers. Unfortunately though taxis and buses have increased many fold, they are often not roadworthy. Most vehicles are overloaded and traffic is congested through out Lusaka, especially in the town centre. Drivers do not follow traffic rules or maintain their vehicles. These are important contributing factors resulting in loss of lives, property and resources. The services required to care speedily and effectively for accident victims have also deteriorated.

A road map of Lusaka (See map of Lusaka in the back cover folder) shows only three major inlets which intersect at the centre of the city in a road named after the capital city of Egypt - Cairo road. On the southern end of the road is the road called Independence avenue that leads to State House and other government buildings like cabinet and the civic centre. Quite conspicuous is the Freedom statue situated about a kilometre from the Kafue round about showing a male human figure with arms raised and a broken chain around his wrists (See picture of the statue on the map of Lusaka) signalling liberation from colonial rule, but not liberation from road carnage!

The commonest form of mass transport in Lusaka is by motor vehicle. During the rush hours the narrow, few and damaged roads are characterised by long queues of slow moving traffic. At major intersections there are defective traffic robots which often malfunction in the rainy season and are replaced by road traffic police men and women. In the busiest parts of Lusaka congestion of vehicles probably keeps speed down, but on the outskirts of the city and in over crowded residential areas where even the police patrol officers are never seen, vehicles are likely to be heavier and faster. They travel at great speed, and impact with any object like a pedestrian, vehicle, animal or environment is likely to be more devastating.

A review of road safety in Zambia by the director of road safety council (unpublished, Nov. 1994) indicates that the motorisation rate of Zambia is estimated at 50 per 1000 inhabitants far lower than that of developed countries like Sweden which has a motorisation rate of 456 vehicles per 1000 inhabitants. Zambia's fatality rate is estimated at 2.23 per 1000 vehicles far higher than 0.19 killed per 1000 vehicles for Sweden. Is this due to the late introduction of cars in Zambia? Certainly Zambia is passing through a phase which Sweden passed through hundreds of years ago. According to Roberts (1995) there is a link between motorisation and development. Motorisation has important implications for the health of a country. Some effects are beneficial, such as improved access to medical care, employment and recreational opportunities. Others, notably traffic accidents and environmental pollution, are detrimental. Road traffic accidents in Lusaka are a major threat to public health and they are likely to increase with more traffic and higher car ownership. Although most Zambians still dream of owning a car, increasing motorisation will be accompanied by a rise in road traffic death rates.

Whether government has realised the danger on Zambian roads is debatable. The recent purchase of Volvo cars for ministers which have inbuilt impact sensitive air bags, is a clear manifestation that government is wary of the state of road carnage. Road traffic problems

affect everyone. Every one has a right to travel on safe roads. Government must choose interventions that are cost effective, self sustaining, cover a wide area and involving a large number of people.

It is with this background that this study attempted to highlight the burden of road traffic accidents in Lusaka.

7.2 Statement of Problem:

Accidents represent a major public health problem in this era. They occur more frequently in certain age groups, at certain times of the day, week and localities. Some people are more prone to accidents than others.(Park and Park, 1995). It is an undisputed fact that road traffic accidents are a major consumer of health services and a waste of human life. Shanks et al. (1994) established that costing of road traffic accidents is often underestimated because of the need to consider the effects of long term disability, which makes demand on health care resources. In UK the average time off work for those with a disability, attending hospital, was nineteen weeks, and eighteen weeks for those without a disability. In Zambia very little effort is made to reduce the scourge. The title of a feature article in the Times of Zambia - August 24, 1996 - describes road carnage as a worrying issue in Zambia. The article states that “The smell of death has become overwhelming because of the careless driving of taxi and minibus drivers who behave like godfathers. And yet the law is aloof”. The article blames the road traffic commissioner. Even after the death of public figures, entertainers and role models in the carnage there are still few efforts to tackle the problem. The picture in Fig. 1 is one of the many accidents that occur in Lusaka daily.

Research to find answers to many public health problems like Human Immunodeficiency Virus (HIV) infection and Acquired Immunodeficiency Syndrome (AIDS) has shown tremendous progress. Unfortunately, road traffic accidents, are a day to day event, if

properly catalogued and recorded would surpass loss of life due to many major health problems.

Because of poor data on road traffic accidents it is necessary to investigate the problem. This study is mainly focussed on risk factors responsible for road traffic accidents and see if any suggestions could be made to reduce their numbers, prevent loss of life and damage to property.

Fig. 1: Pedestrian crushed to death by a truck along Great East Road in Lusaka



Source: *Times of Zambia* 24 August, 1996.

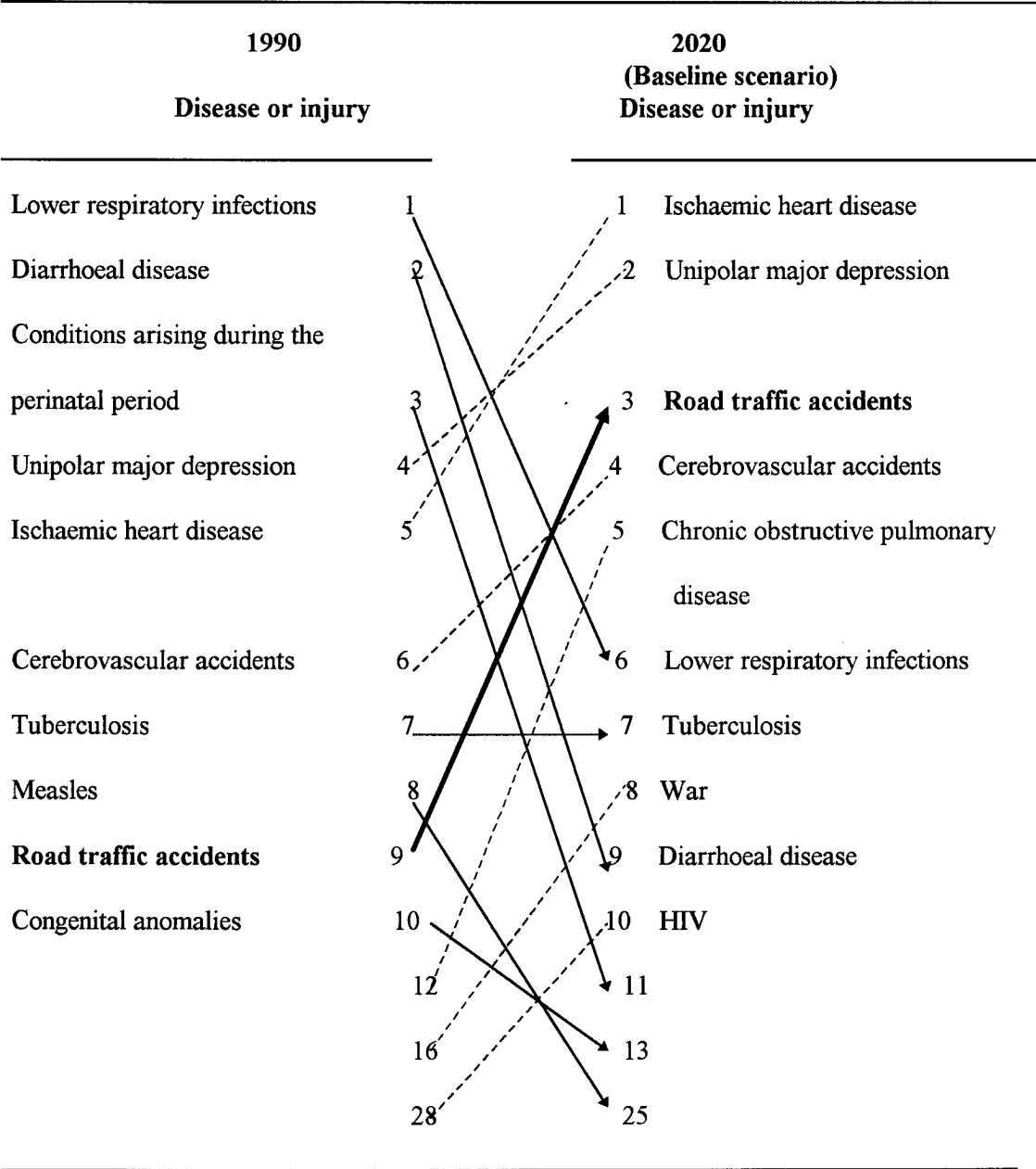
7.3 LITERATURE REVIEW

In 1990, WHO rated accidents as one of the chief causes of death among persons 10 - 24 years. They are responsible for approximately 10 percent of deaths in developing countries. (WHO, 1980). Approximately 3.5 million people die yearly from injuries. Almost one million people die of intentional injury and 2.5 million from unintentional injury including those resulting from accidents on roads, domestic accidents, from fires, drowning, poisoning, falls and from natural disasters. (Health Education in South-east Asia, 1993)

Murray and Lopez (1996) have predicted that the next two decades will see dramatic changes in the health needs of the world's populations. In the developing regions where four-fifths of the planet's people live, noncommunicable diseases are fast replacing infectious diseases and malnutrition as the leading causes of disability and premature death. By the year 2020, noncommunicable diseases are expected to account for seven out of every ten deaths in the developing regions, compared with less than half today. Injuries, both unintentional and intentional, are also growing in importance, and by 2020 could rival infectious diseases world wide as a source of ill health. Road traffic accidents are expected to rank third (from current ninth) among the leading deaths in the developing world. (Fig 2).

Global studies have shown that road traffic accidents are associated with several varieties i.e. age, sex, race, alcohol consumption, time of day and type of vehicle. The trends of road traffic accidents in New Papua Guinea as shown by Jayasuriya (1991) demonstrates road traffic accidents as a rapid emerging problem of developing countries. Data of a time series for twenty years were analysed to ascertain the trends in man indicators and injury rate. The relationship of injuries to road users and type of vehicle highlighted the problems of passengers of utility vehicles and buses.

Fig 2. Change in the rank order of disease burden for 10 leading causes, world, 1990 - 2020



Source: Disease burden measured in Disability-Adjusted Life Years (DALYs), Vol I p 375

In North Carolina, Stutts and Martell (1992) studied motor vehicle crash data for even numbered years (1974 - 1988) inclusive. They examined trends in motor vehicle crash involvement by driver's age, sex and race. They showed that older drivers representation in the licensed driver population had increased at a greater rate than their representation in

either census or crash involvement populations. These trends were partially strong for non-white women. Crash rates had declined more for drivers aged 55 and older than for younger drivers. Males shared a higher overall crash rates per kilometre. But a study by Harris, et al. (1992) showed that the rate of decline in hospitalisation was similar for fatalities and was not generally related to age or sex. There was evidence of a more rapid decline in the rate of severe injuries than in minor ones. Lessard and Dooval (1993) showed victims of 65 years of age and over to have a high degree of vulnerability.

Road conditions are also important. Williams, et al. (1991) demonstrated in Scotland that a road's gradient, curvature, width, lighting, road markings and the presence or absence of hard shoulders and crash barriers contribute to the likelihood of accidents. Although these valuables are important, an additional failure which was probably of more significance than in England and Wales is a rural population relying on unsuitable roads.

In his paper on road traffic accidents in Lusaka, Baboo (unpublished, Oct. 1988) highlighted that one of the major reasons for the increase in road traffic accidents is attributed to drivers who do not follow the traffic rules. He concludes that unruly passengers, drivers under the influence of alcohol, cigarette smoking and mannerisms, all increase the risk of accident.

In Zambia few studies have been done on road traffic accidents. Sharma (1980) reported that 7,879 accidents occurred in Zambia out of which 680 people died, 2,773 were seriously injured and 1,714 slightly injured. The high risk groups were drivers and passengers. It was reported that twenty five per cent of all accidents in Zambia occurred in Lusaka and yet no specific study has been done to this effect.

Park and Park (1995) support the concept that the future of accidents prevention is in research. Such research ought to be concerned with gathering information about the extent, type and other characteristics of accidents, correlating accidents experience with personal

attributes and environments in which accidents occur, investigating new and better methods of altering human behaviour; and seeking ways to make environment safer and evaluating more precisely the efficiency of control measures.

It is clear that there are multiple factors responsible for causation of road traffic accidents. There is great need to carry out research to assess the magnitude of road traffic accidents. The proposed study is one that hopes to make an audit of road accidents in Zambia. However, due to time and resource limitations the study was confined to Lusaka. Lusaka had been purposely chosen because of the high number of accidents reported by the police, proximity to institutions like insurance offices, meteorological and road safety council. A descriptive epidemiological study was chosen because it requires a good source of data which Lusaka - the base needed for this study - has.

7.4 AIM:

The principal aim of the study was to identify the risk factors influencing the occurrence of road traffic accidents in Lusaka.

7.5 Specific objectives:

1. To determine the magnitude of road traffic accidents.
2. To make recommendations to relevant authorities as to how road traffic accidents could be minimised.

7.6 STUDY HYPOTHESIS:

The aim was to test the null hypothesis that information on road traffic accidents is not adequate due to inadequate recording system. The alternative hypothesis was that information on road traffic accidents is adequate.

8.0 METHODOLOGY

8.1 Study Design and Setting:

The study was conducted in two parts. **Part I was a prospective** study which was conducted in the casualty wing and surgical wings of UTH. **Part II was a retrospective** situation where data was collected from records of Road Safety Council, Meteorological department, ZSIC, UTH and Zambia Police Service.

8.2 Study Population:

The study population was road traffic accident victims seen at UTH between 12th October, 1996 and 11th January, 1997. During this time a total of 10,633 persons with surgical problems visited the casualty wing of the hospital out of which 993 were road traffic accidents. A total of 385 accident victims fulfilled the selection criteria and gave consent to participate in this study. The rest did not qualify. Either they did not give consent or were rejected.

8.3 Data Collection:

Data collection tools were:-

- a) Police routine statistics
- b) Insurance company reports
- c) Hospital records
- d) Meteorological rainfall records
- e) Personal interviews with key persons representing Zambia Police, insurance and road safety council.
- f) Questionnaire for road traffic accident victims at UTH.

A questionnaire was designed to elicit risk factors and get patients' first hand information on the cause of accidents and how they could be avoided. A pilot study of 8 cases was conducted on 11th October, 1996 at casualty wing of the hospital. The main study lasted from October

12th, 1996 to January 11th, 1997. It was not possible to interview all the patients who were eligible for the study at the casualty wing. Some patients reported at the hospital at early or late hours of the day and were discharged before they were recruited. Before conducting any interview a consent was obtained.

An effort was made to visit casualty every day. Patients who were not recruited on admission were later followed up in the wards. Some patients opted to keep the questionnaire and fill it in at their own convenience. Deceased victims of accidents, children below 16 years, referred patients and those accidents that took place in unclassified areas were not recruited. Very sick patients were later followed up in the wards to find out if they were capable of participating in the study. No relative of a patient was interviewed. Patients were at liberty to withdraw from the study.

Interviews were held with representatives of the Public Relations Officer of Zambia Police Service, Zambia Police Lusaka Urban Commanding Officer, Managing Director of Zambia State Insurance Corporation and the Director of Meteorological Department to determine the extent of the road traffic accident. The Road Traffic Commissioner referred all queries to the Director of Road Safety Council. A checklist was prepared and was given to heads of institutions two weeks prior to an interview.

8.4 Statistical Analysis:

All data collected from Part I and Part II were as subjected to computer analysis using Epi-Info version 6.02 statistical package.

8.5 Ethical Consideration:

The proposal was first submitted to the research and ethics committee of the University of Zambia. The study proceeded after its approval. Then, permission was obtained from the heads of several institutions to collect data e.g. UTH executive director, ZSIC managing director,

Road Traffic Counsel director, Meteorological department director, ZP commanding officer for Lusaka Urban and Inspector General of Police. Consent was also obtained from road traffic accidents victims before proceeding with an interview. Strict confidentiality was exercised during the process of data collection. Data obtained from the respondents was not availed to the insurance firm or the police.

9.0 **DEFINITIONS**

For the purpose of this study an accident was defined as an event that happens unexpectedly and causes damage or injury. There should be sudden unexpected series of undesired occurrences in interplay between individual objects and the environment which leads to damage or personal injury.

A road traffic accident is an event, therefore, which has occurred on a road in which at least one vehicle (car, bus, lorry, motor bike, bicycle) had been involved and in which personal injury had been inflicted. Accidents which occurred within fenced-in areas such as barracks, yards, industrial sites, hospital grounds, sports grounds or other similar areas were excluded, Schelp and Ekman (1990).

Classified as roads were:-

=> road, street, square and other thoroughfare generally used for traffic

=> passage devised for bicycle traffic

=> footpath

According to Form ZP123, Register of Road Traffic Accidents, injury at site of injury is categorised into slight or serious injury and death. The following injuries are classified as serious:

- i) fractures, concussions, internal injuries, crushings, severe cuts, lacerations, severe general shock requiring medical treatment and other injuries involving removal from the scene of accident to and detention in hospital as “in-patient”.

Classified as minor injuries are:

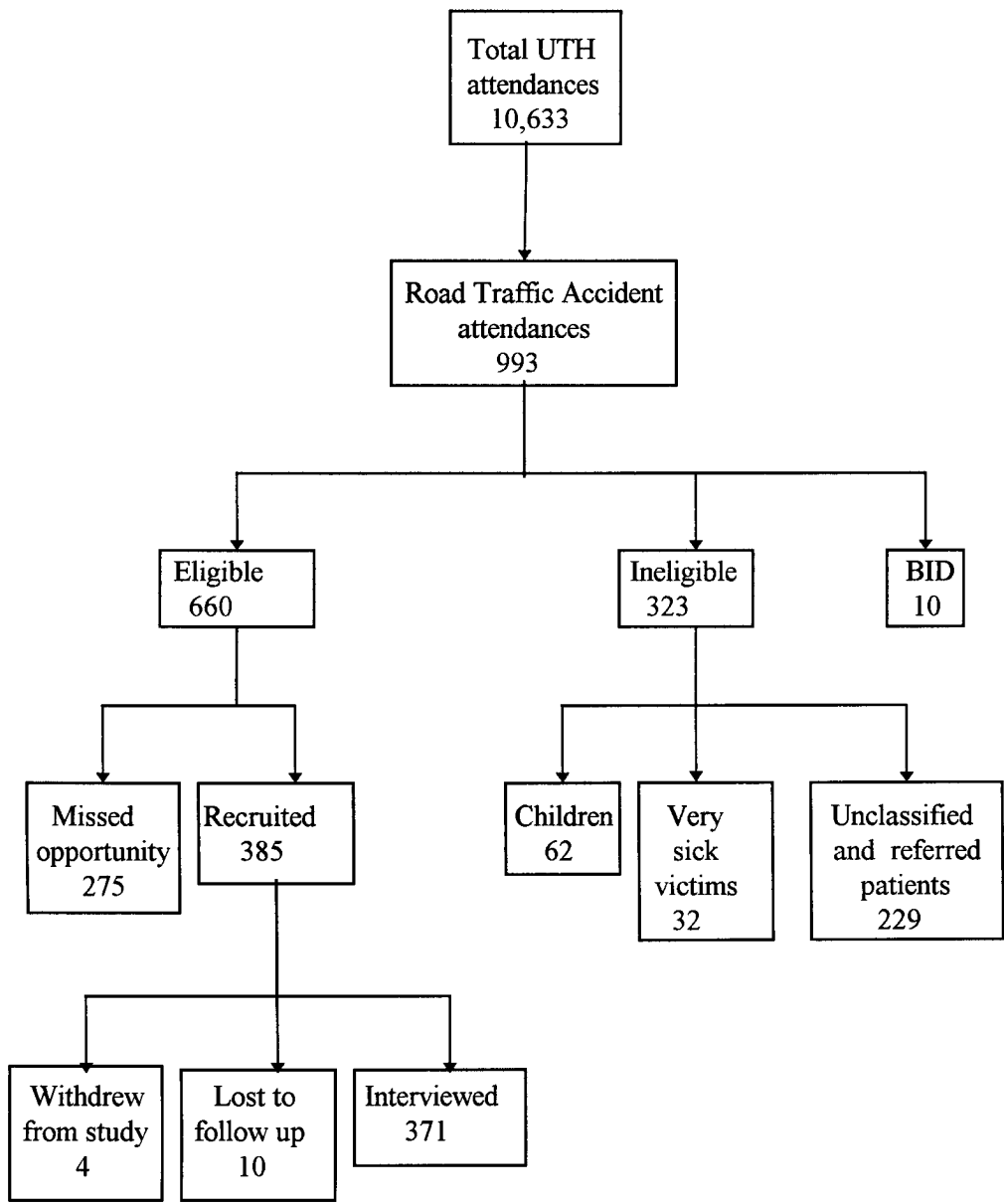
- (ii) injuries of a minor nature such as sprains and bruises, persons who complain of shock but who sustain no other injury are not included in this category unless they exhibit some clear symptoms of shock, receive, or appear to need medical treatment.

10.0 RESULTS

10.1 PART I

There were 10,633 attendances at the University Teaching Hospital out of which 993 (9.3 percent) were due to road traffic accidents. 333 of the 993 patients were not eligible for the study. These included referred patients, children, very sick patients, deceased and

Figure 3: Selection of Candidates for Interviews.



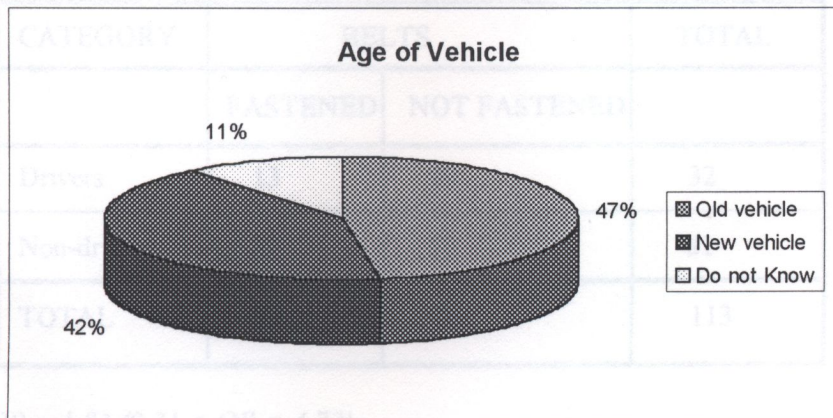
patients whose accidents occurred in unclassified areas. There were 10 victims of road traffic accidents who were brought-in-dead. 275 missed an opportunity to be interviewed. 385 were recruited for the study and 10 were lost during follow up; four withdrew from the study resulting in 96 percent response rate. (Fig.3).

Table 1: Percentage of Accidents in Lusaka in Relation to Sites

| SITE | NUMBER | PERCENTAGE |
|-------------|--------|------------|
| Residential | 297 | 80 |
| Town centre | 74 | 20 |
| Total | 371 | 100 |

297 (80 percent) of the of the respondents indicated that the accidents in which they had been involved took place in residential area and 74 (20 percent) in the town centre, resulting in residential/town centre accident scene ratio of 4:1.

Figure 4: Percentage of Vehicles by Age Involved in Accidents in Lusaka



165 (47 percent) of the vehicles were classified as old by respondents; 155 (42 percent) were classified as new and 40 (11 percent) of the respondents could not determine the age of the vehicle.(Fig. 4)

Table 2: Distribution of Accident Victims in Lusaka by Sex and Age

| AGE GROUP (YEARS) | MALES (%) | FEMALES (%) | TOTAL (%) |
|-------------------|-------------|-------------|-------------|
| 16 - 20 | 42 (14.79) | 17 (19.54) | 59 (15.90) |
| 21 - 30 | 117 (41.20) | 33 (37.93) | 150 (40.43) |
| 31 - 40 | 70 (24.65) | 21 (24.14) | 91 (24.53) |
| > 40 | 55 (19.37) | 16 (18.39) | 71 (19.14) |
| Total | 284 (100) | 87 (100) | 371 (100) |

284 (76.5 percent) of the respondents were male and 87 (23.5 percent) were female. This provides a male/female ratio of 3:1. In total 59 (15.9 percent) were between 16 - 20 years, 150 (40.4 percent) between the ages of 21 - 30, 91 (24.5 percent) between 31 - 40 years and 71 (19.4 percent) over 40 years old. (Table 2).

Table 3: Distribution of Motor Vehicle Users Who Fasten Seat Belts in Vehicles

Fitted With Seat Belts

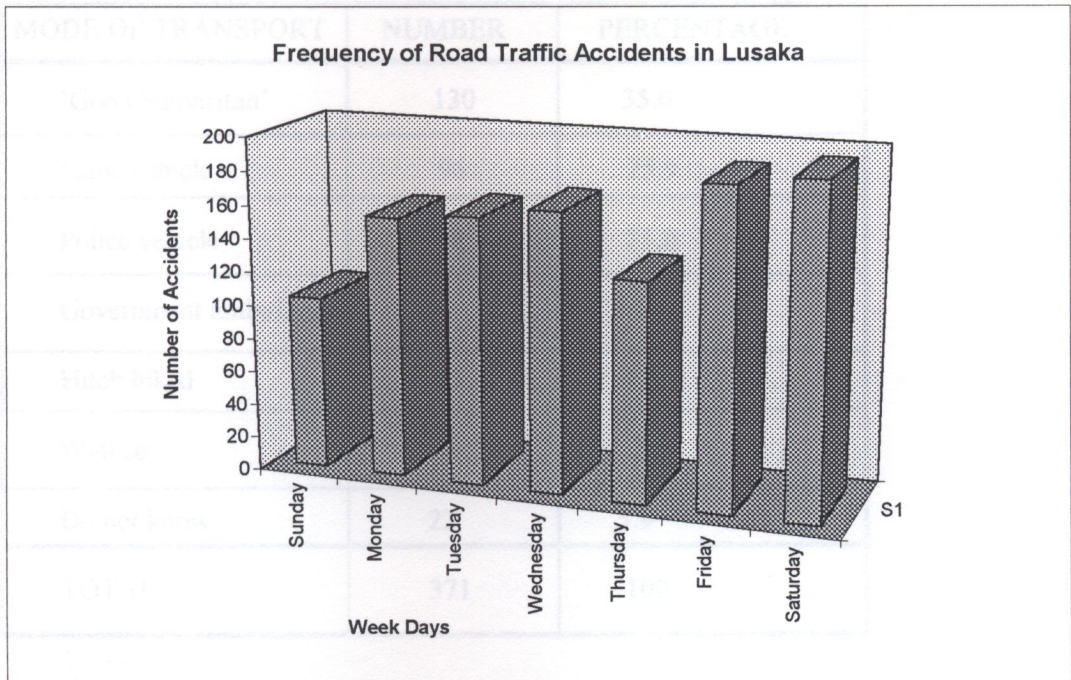
| CATEGORY | BELTS | | TOTAL |
|-------------|----------|--------------|-------|
| | FASTENED | NOT FASTENED | |
| Drivers | 13 | 19 | 32 |
| Non-drivers | 22 | 59 | 81 |
| TOTAL | 35 | 78 | 113 |

$OR = 1.83 \ (0.71 < OR < 4.72)$

$X^2 = 1.95, \ p\text{-value} = 0.1631 \text{ at } 1 \text{ degree of freedom.}$

Table 3 shows drivers and passengers in vehicles with the provision of seat belts who had or had not fastened at the time of the accident. There was no significant statistical difference between the two groups.

Figure 5: Frequency of Accidents in Lusaka in Relation to Week Days



The frequency of road traffic accidents on days of the week runs a gradual increase from Mondays to Wednesdays followed by a fall on Thursdays. It was observed that this was followed by a sharp increase on Fridays and the highest was recorded on Saturdays. (Fig 5.)

Table 5: Percentage of Accident Victims by Marital Status

| MARITAL STATUS | NUMBER | PERCENTAGE |
|----------------|--------|------------|
| Married | 209 | 56 |
| Single | 140 | 38 |
| Divorced | 12 | 3 |
| Widowed | 10 | 3 |
| TOTAL | 371 | 100 |

Table 4: Percentage of Type of Transport for Accident Victims in Lusaka

| MODE OF TRANSPORT | NUMBER | PERCENTAGE |
|----------------------|--------|------------|
| ‘Good Samaritan’ | 130 | 35.0 |
| Same vehicle | 96 | 25.9 |
| Police vehicle | 78 | 21.0 |
| Government ambulance | 19 | 5.1 |
| Hitch hiked | 17 | 4.6 |
| Walked | 9 | 2.4 |
| Do not know | 22 | 5.9 |
| TOTAL | 371 | 100 |

Table 4 shows distribution of modes of transport for patients. 35.0 percent of victims were assisted by “good Samaritans”; 25.9 percent mostly pedestrians were assisted by the same drivers who hit them; 21.0 percent used police vehicles.

Table 5: Percentage of Accident Victims by Marital Status

| MARITAL STATUS | NUMBER | PERCENTAGE |
|----------------|--------|------------|
| Married | 209 | 56 |
| Single | 140 | 38 |
| Divorced | 12 | 3 |
| Widowed | 10 | 3 |
| TOTAL | 371 | 100 |

76 percent of single status victims were students. Out of those who were married, divorced or widowed 84 percent were either in formal or informal employment. Table 4 shows distribution of accident victims by marital status.

Figure 6: Twenty Four Hour Time Frequency of Accidents in Lusaka

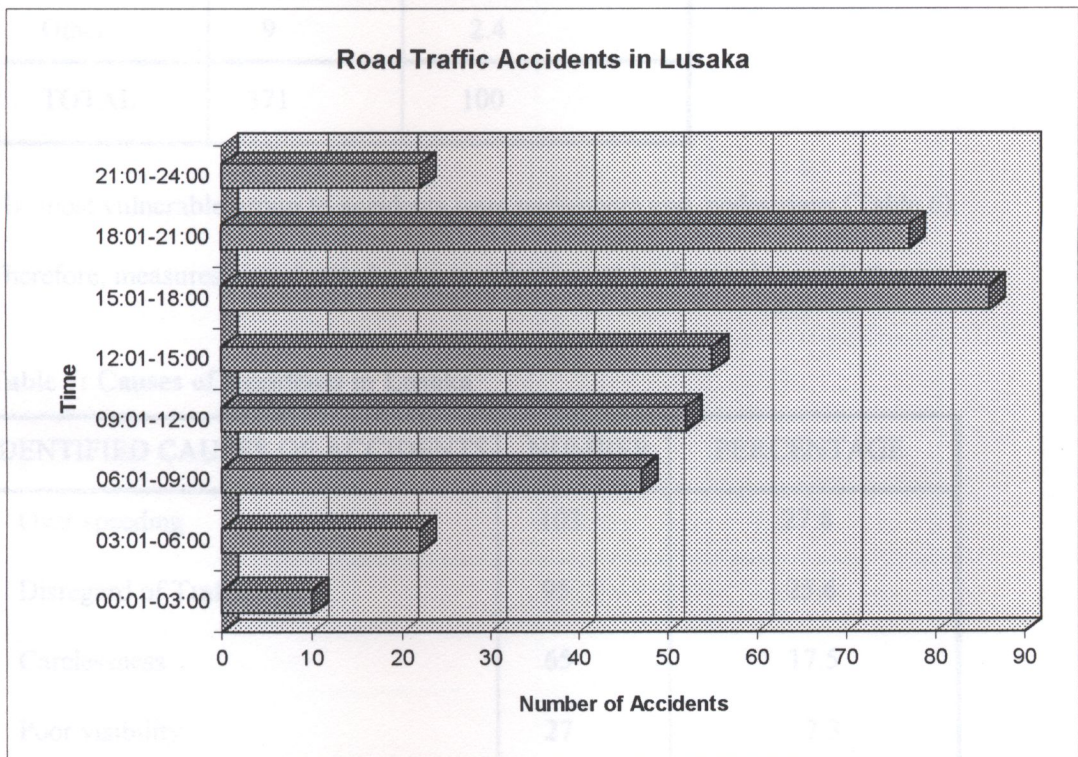


Fig. 6 above shows a preponderance of more accidents between 15:00 - 18:00 hours.

Studies done before have shown that there are usually two peaks viz-a-viz morning and evening rush hours. This was not elicited from the sample interviewed.

Table 6: Percentage of Road Users Involved in Accidents in Lusaka

| CAPACITY | NUMBER | PERCENTAGE |
|--------------|------------|------------|
| Passenger | 160 | 43.1 |
| Pedestrian | 149 | 40.2 |
| Driver | 53 | 14.3 |
| Other | 9 | 2.4 |
| TOTAL | 371 | 100 |

The most vulnerable group to accidents were passengers and pedestrians.(Table 6).

Therefore, measures aimed at reducing accidents must be directed towards this group.

Table 7: Causes of Accidents in Lusaka

| IDENTIFIED CAUSES OF ACCIDENTS | NUMBER | PERCENTAGE |
|--------------------------------|------------|------------|
| Over speeding | 103 | 27.8 |
| Disregard of Traffic rules | 95 | 25.6 |
| Carelessness | 65 | 17.5 |
| Poor visibility | 27 | 7.3 |
| Slippery Roads | 24 | 6.5 |
| Alcohol | 12 | 3.2 |
| Pot holes | 10 | 2.7 |
| Mechanical faults | 8 | 2.2 |
| Tire burst | 8 | 2.2 |
| Stress | 7 | 1.9 |
| Misjudgement of distance | 6 | 1.6 |
| Others | 6 | 1.6 |
| Total | 371 | 100 |

The commonest cause of accidents was overspeeding (27.8 percent) followed by disregard of traffic rules and carelessness. Alcohol (3.2 percent) and potholes (2.7 percent) followed in that order.(Table 7).

Table 8: How Accidents Could Have Been Prevented in Lusaka

| PREVENTIVE MEASURE | NUMBER | PERCENTAGE |
|--|------------|------------|
| Reducing speed | 56 | 15.1 |
| Enforcing the law | 43 | 11.6 |
| Patience | 42 | 11.3 |
| Obedying traffic rules | 39 | 10.5 |
| Roughening the road surface | 21 | 5.7 |
| Speed humps/traps | 20 | 5.4 |
| Nothing (accident was inevitable) | 26 | 7.0 |
| Do not know | 18 | 4.9 |
| Road signs should be clear | 17 | 4.6 |
| Other party was at fault | 16 | 4.3 |
| Vehicles should be serviced | 13 | 3.5 |
| Conduct refresher cources for drivers | 11 | 3.0 |
| Avoid boarding unregistered public transport | 14 | 3.8 |
| No comment | 35 | 9.4 |
| TOTAL | 371 | 100 |

Table 8 summarises the responses submitted by road traffic victims. Overall it was found that 79.3 percent of the respondents felt that the accidents were caused by human error or negligence and that the accident could have been avoided by taking precautions or by being careful; 7.0 percent justified the occurence of the accidents by claiming that there was

nothing that they could do; 9.4 declined to offer solutions of how the accidents could have been avoided; where as 4.3 blamed the other party. (Table 8)

10.2 PART II

Table 9: Morbidity Pattern of Road Traffic Victims in Lusaka

| MORBIDITY | NUMBER | PERCENTAGE |
|----------------|--------|------------|
| Minor Injury | 143 | 42.8 |
| Serious Injury | 134 | 40.1 |
| Death | 57 | 17.1* |
| Total | 334 | 100 |

**Case fatality = 17.1 percent*

During October 12th, 1996 to January 11th, 1997 there were 1,097 accidents in Lusaka involving 1,967 victims. 334 persons were injured (including death) in road traffic accidents out of which 143 (42.8 per cent) of them received slight injuries; 134 (40.1 per cent) received serious injuries and 57 (17.1 per cent) of them died on the spot. The case fatality rate was 17.1 percent. Table 9 above shows morbidity pattern of road traffic accident victims.

Table 10: Distribution of Road Traffic Accident Fatalities

| STATUS | NUMBER | PERCENTAGE |
|------------|--------|------------|
| Pedestrian | 47 | 82.4 |
| Passenger | 5 | 8.8 |
| Driver | 3 | 5.3 |
| Cyclist | 2 | 3.5 |
| Total | 57 | 100 |

Table 10 shows the distribution of road traffic accident fatalities. It is evident that a high proportion of pedestrians was found among all deaths (82.4 percent). Passengers (8.8 percent), drivers (5.3 percent) and cyclists (3.5 percent) were found to be next in order of frequency of deaths. The 47 pedestrians who died on the spot were part of 247 pedestrians hit by vehicles.

Table 11: Distribution of Road Traffic Fatalities Due to Cars by Category of Road User

| CATEGORY | NUMBER | PERCENTAGE |
|------------|--------|------------|
| Pedestrian | 24 | 85.7 |
| Passenger | 2 | 7.1 |
| Driver | 1 | 3.6 |
| Cyclist | 1 | 3.6 |
| Total | 28 | 100 |

Out of the total 57 road traffic accidents fatalities shown in Table 10, Twenty eight were caused by cars. 85.7 percent of all victims who were killed by cars were pedestrians. 7.1 percent passengers, 3.6 percent cyclist and another 3.6 per driver as shown in Table 11.

Table 12: Percentage of Motor Vehicles Involved in Accidents in Lusaka

| VEHICLE | NUMBER | PERCENTAGE |
|-------------|--------|------------|
| Car | 1,367* | 75.57 |
| Bus | 290 | 16.03 |
| Lorry | 128 | 7.08 |
| Bicycle | 18 | 0.99 |
| Motor Cycle | 4 | 0.22 |
| Taxi | 2 | 0.11 |
| Total | 1,809* | 100 |

**Footnote: Some accidents involved multiple vehicles and hence evidence of more vehicles (1,809) than actual number of accidents (1,097).*

There were 1,809 vehicles involved in accidents out of which 1,367 were cars. Table 12 shows the distribution of vehicles involved in accidents during the three month period.

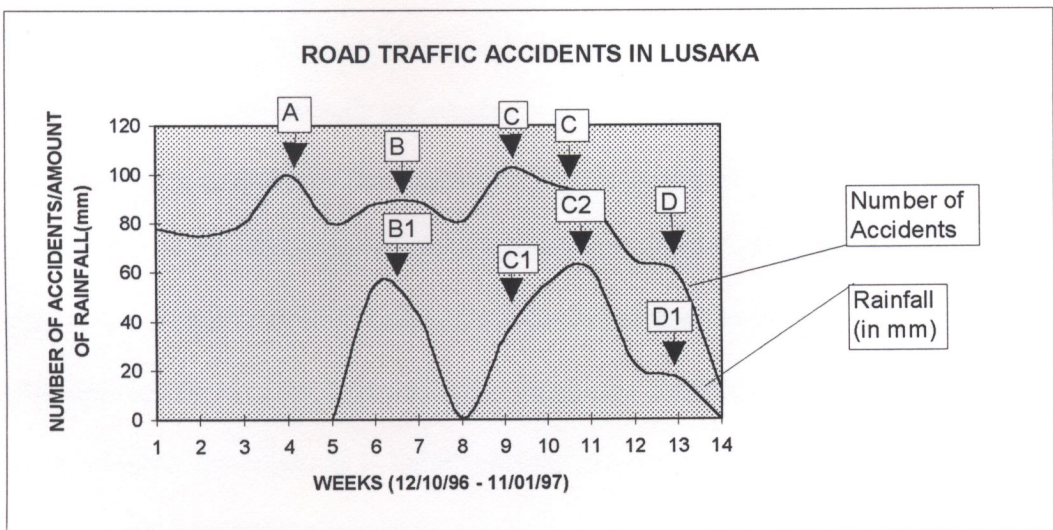
Figure 7: Trend of Road Traffic Accidents in Lusaka in Relation to Rainfall

Fig. 7 above graph shows the relationship between road traffic accidents and rainfall Pattern.

There was a rise in the number of accidents (Peaks A, B, C and D) which corresponds to the rise in the rainfall pattern (Peaks B₁ C₁ and D₁). There was no obvious explanation for the peak A. The fall after peak A could be attributed to the road safety education campaign.

A total of 103 own damage valued at ZK279,434,660.00, were paid out in the period under review. 23 claims were paid out in third party property damage whose total cost was ZK63,384,563. 328 (76.1 percent) claims were made by male drivers and 103 (23.9 percent) were made by female drivers resulting in male/female ratio of 3:1.

11.0 **DISCUSSION**

The study analysis of Road Traffic Accidents during October 1996 and January 1997 has clearly reflected the steady increase of accidents in Lusaka. 1996 Ministry of Health Annual Report has shown accidents to be featuring among the 10 most important causes of admissions and ninth important causes of death both in Lusaka and other big cities of Zambia. The factors were mainly attributed to bad roads, lack of proper maintenance of vehicles and violation of traffic rules. This study looked at the actual scenario revolving around road traffic accidents in Lusaka. Care was taken to look into the records and admissions in the casualty and surgical wings of UTH.

Records of the Ministry of Health have shown (since 1982) that road traffic accidents are very high in Lusaka because of sudden increase in population, number of vehicles and emergency of many illegal and legal settlements. The settlement areas are highly congested and infested with indiscriminate movement of the people and traffic. If people and traffic are separated chances of such accidents would be minimised.

Stage I of the study shows the analysis of road traffic accidents among individuals and car drivers who attended the casualty and surgical wards of UTH for treatment and management of their injuries. The results of 371 cases are analysed and discussed in this section of the report. The study shows that 80 percent of all accidents occurred in residential areas.(Table 1). In this context, it is important to remember that in the absence of an established road network and high population density the chances of collisions are very high. In the town centre the proximity to the hospital and passers-by is advantageous since most of the patients reach the hospital within the 'golden hour'.

Table 2 shows 300 (81 percent) of the victims of road traffic accidents to be below the age of 40 and 71 (19 percent) cases were above the age of 40. This can be attributed to greater

exposure and risk taking behaviour in young people. Table 5 has shown accidents increased from Friday and reached the peak on Saturday and were much less on Sunday. Accidents again increased on Monday giving a second peak on Wednesday with a fall on Thursday. This clearly demonstrates a correlation of accidents during working hours and weekends. Assistance to the victims (Table 4) was mainly provided by “good Samaritans”, the vehicle and driver involved and police vehicles in that order. It is important to note that assistance given by government ambulances was surprisingly low, 5.1 percent, and yet there are many ambulances in Lusaka. One wonders if government could redress the problem and provide a proper ambulance service to come to the assistance of the accident victims.

The majority of the victims were married. In the review of literature there was no study which attributed marriage as a contributing factor of road traffic accidents even though Table 5 of the study is showing 209 of the 371 victims were married people. Those who were single were 140 and most were students. Observations have shown single and young drivers to be reckless. Zambian community by tradition is of an outgoing type. People enjoy their recreation and are often a happy-go-lucky type. Visiting pubs, bars, and night clubs is one of the major contributing factors, only possible in evenings and late hours. The return journey from these places is often found to be hazardous and dangerous because they often fall victims to accidents under the influence of alcohol and reckless behaviour. The 24 hour time frequency of road traffic accidents is shown in Figure 6. Accidents are common between 06.00 and 09.00 hours when majority of people rush to work. There are only three flyover bridges for people to cross from one end of the city to the other end by government transport, public transport, personal cars or on foot. As a result of this in the morning from 08.00 to 09.00 hours and in the evening from 16.00 to 17.00 hours there is heavy traffic and often traffic jam, resulting in intervention of traffic police to ease the traffic jam and allow people access to their destinations. It is at this time people lose patience and drive recklessly.

The increase of accidents at night has many reasons. Not all the streets and roads are lit properly. Traffic signs are not visible or functional and the majority of the roads are poor, they are full of potholes, broken, narrow and unrepaired. Travelling on these roads becomes dangerous especially at night. These factors are very clearly demonstrated in Table 7 which shows factors responsible for accidents. Alcohol at night is an extra and major hazard increasing risk, resulting in reduced concentration and skill.

While road safety, vehicle road worthiness, legislation and its enforcement are probably the major factors in ensuring safer transport, this study has indicated several areas where more work would be available. Old vehicles are often involved in road traffic accidents. Penalty, inspection and certification of road worthiness should be considered. The fact that seventy nine percent of the respondents indicated that the accidents could have been avoided if police could play a greater role in enforcing the law. Patrol cars or police motor bikes are never seen in residential areas where most of the drivers cruise recklessly, were passengers after taking alcohol do not anticipate fast moving vehicles. Speed humps are not adequate and speed traps not enforced. The road safety council and the police have operational constraints, but even so seem to take little interest and even their statistics on main road traffic accidents are unreliable. The fact that the local authority, which is the only body that is empowered to look after the highways and other roads, seems not to be concerned with road safety, heightens the need for lobby groups. In the absence of public interest the road carnage picture is gloomy for the future of road users in Zambia. It is gratifying that the World Bank will be funding the improvement of blind spots in Zambia. How long is an innocent road user going to wait for a donor to come and improve road safety? Some of the interventions involve behavioural change that can start now.

The present study has tried to analyse the true picture of road traffic accidents, timing of such accidents, factors responsible for loss of life and damage to property. The data

collected from records of road traffic office, insurance agency and meteorological department have revealed that in three months there were 1,967 victims in Lusaka. Among the injured were 57 deaths, a case fatality rate of 17.1 percent. Road traffic accidents are a major health problem and cause of disability and death as indicated by the Ministry of Health 1996.(Table 9).

Table 10 shows that most victims were pedestrians (85.7 percent). This was an unusual finding since most studies have revealed that passengers are more at risk than any other road users. This finding is peculiar to Zambia and was supported by the director of road safety. It is attributed to over population and over crowding in the City of Lusaka. The People at risk are mostly uneducated settlers, who have migrated from rural areas with little traffic sense and are at risk.

Among the various types of vehicles used in the City of Lusaka, cars were found to be involved in most road traffic accidents as shown in Table 12. These were mainly car drivers who belonged to the younger generation. This concurs with views expressed by the Lusaka Division Commanding Officer and the Editor of Times of Zambia. It was surprising to note that very few taxis (0.11 percent) were involved in accidents and yet the public blames taxi drivers. It was, however, difficult to distinguish pirate taxis from registered taxis. Probably a big proportion of cars could have been non registered pirate vehicles. In the absence of evidence one can only attribute 23 percent of the total accidents to be due to buses and lorries or trucks compared with 76 percent due to cars alone.

Increased rainfall is another contributing factor which is reflected on the seasonality of road traffic accidents. 1996/97 Meteorology Department report has related increased rainfall to be contributing to high number of car accidents as shown in Fig 2. Roads become slippery when it rains. Drivers lose control easily. This puts the pedestrians and street vendors, who spend most of their times on the road sides, at a very high risk of being knocked down.

Road traffic accidents are costly. The economic impact is catastrophic in a poverty stricken community with an average income of K60,000 to K100,000 per month, an accident can prove to be a life long economic and social instability. Loss of life and injuries inflicted on other people are often found to be very expensive in terms of compensations to the victims, loss of working hours and death contributed by traffic accidents. The unexpected lack of Plaster of Paris (POP) in the hospital was the starting point of the long term incapacitating effects of road trauma for most patients. Those who could not afford to buy POP were asked to persuade the ones who hit them or relatives or take the chance of waiting for the hospital supplies which were very irregular. Patients with long bone fractures were found to be on the floor literally lying on bed sheets. Such patients were very demoralised and disappointed with the quality of health services.

It should be noted that only 25 percent of Zambia's population is in employment. If this productive population is reduced further by the toll of accidents the dependency ratio will increase. According to the managing director of ZSIC, an expenditure of K340 million was given to the victims of road traffic accidents in terms of compensation between 12th October, 1996 and 11th January, 1997. This is a colossal loss of revenue to the country which could have been used for constructive purposes such as improvement of blind spots, building new roads, establishing proper and effective channels of communication rather than spending money on treating injuries, repairing or replacing of vehicles and paying compensation to the victims of road traffic accidents, some such claims are fraudulent.

12.0 CONCLUSION

The result of this study demonstrates road traffic accidents to be a public health problem in Lusaka. Accidents are common among adolescent drivers who are often under the influence of alcohol. There is an indulgence of younger adolescents of either sex in adventurous driving, most of whom are unlicensed and inexperienced. Bad roads and rainfall are associated with a rise in road traffic accidents.

It is very difficult to maintain order among people who lack experience and knowledge of road safety. For safe and defensive driving one needs to have a lot of patience for control of ones behaviour. Knowledge of the vehicle and the roads is equally important for safe driving as echoed by Williams (1991) in his study on Deaths from Road Traffic Accidents in Scotland.

This study confirms that high speed, disregard of traffic rules and carelessness are some of the known risk factors associated with road traffic accidents. Pedestrians are the most risk category of road users and hence preventive interventions should be directed at this group.

The country as a whole is yet to compile complete statistics on road traffic accidents.

13.0 RECOMMENDATIONS

This section discusses in some detail some of the measures that can be adopted with the aim of raising the quality of drivers and improving the behaviour of pedestrians and passengers.

Information is cardinal to the whole question of scientific approach to the problems of road safety. There is a need to establish basic **reporting** system of all accidents. The national data should be supplemented by special surveys and in depth studies of all road traffic accidents throughout the country. The present reporting system is very poor. Often accidents are under reported because of fear, malpractice and lack of facilities. Detailed environmental data relating to roads, vehicles and weather must be collected all the time for future reference.

The road traffic council, police and insurance companies play a very important role in investigating accidents for legal and preventive purposes. These institutions need to be **co-ordinated**. They need to be familiarised with what other institutions are doing and disseminate the information to relevant organisations urgently. Without an effective data collecting system, analysis, interpretation and reporting there would be no counter measures and evaluation of intervention. Since causes of accidents are multi-factorial prevention must be multi-sectoral. Therefore measures should include the following:

a) **Primary prevention:**

There is a wide spread belief that accidents are inevitable and unavoidable. This is a dangerous attitude which must be curbed at all respects. Road safety and health promotion about traffic rules should start at School.

Before issuing a driving licence care should be taken to investigate whether the recipient of the driving licence is of age, has proper knowledge of driving, its laws and implications. Under age licensing and fictitious certifications should be investigated. Drivers must be trained on

proper maintenance of vehicles and safe driving. Young people should be educated about risk factors, traffic rules and safety precautions. They should also be trained on the maintenance of first aid kits in their vehicles and applying first aid to road traffic accident victims.

The legislature in Zambia on seat belts is not clear. For instance, it is not clear whether passengers at the back seat are supposed to fasten seat belts. Seat belt use should be encouraged although some vehicles in the country do not have seat belts, hence making enforcement difficult.

Legislation concerning road safety is very weak and has fallen behind development of motorisation in Lusaka. Legislation should be revised, enacted and enforced by the state. Careless drivers should be punished and sometimes their licences revoked. For instance if a driver makes many mistakes which are recorded by using a scoring system the driving licence should be withdrawn. Very serious offences involving loss of life calls for prosecution. Blind spots should also be improved. The revelation by the Director of Road Safety that reports reach the council five months late should be addressed urgently.

b) Secondary Prevention:

The aim of seeking treatment is to save loss of life. Management of road traffic accident victims should be a fundamental element of any health care system. Hospitals and concerned authorities should set up specialised and well equipped rapid response teams.

c) Tertiary Prevention:

The aim of tertiary prevention is to reduce or limit impairments and disabilities, and to promote accident victim's adjustment to irremediable conditions. For example, treatment of injuries even if undertaken very late may prevent sequelae and limit disability due to road traffic accidents.

d) Accident Research:

Authorities should carry out regular evaluations using **appropriate technology** to check the effectiveness of control measures. A major study should be conducted. The future of accident prevention is in the **application of research findings**.

14.0 LIMITATIONS

This was a difficult study. It had no control group. Not all patients were interviewed. Some patients went away with questionnaires. Ten patients were lost to follow up and 4 declined to be recruited. The study commenced late because of the nurses' strike at UTH. The cost of treating patients at the hospital could not be determined. Costing for health services rendered to road traffic victims should have been planned well before starting the study to reflect individual cost of treatment for patients seen at UTH.

The results of this study can not be generalised. However, the findings are worth considering in order to improve road safety. The authenticity of data can only be justified if a twenty-four hour circle of accidents followed by daily, monthly and yearly record keeping of all road traffic accident victims is determined. Though a much cheaper study would involve following up accidents on the first four days of every month for a period of one year. The study should include a methodology of quantifying the burden of road traffic accidents. A multi-centred study in different localities and geolocations of the country could focus on the validity and accuracy of data collected.

This being a short study can not fulfil these desired results. However, the data and necessary information acquired from this study is of vital importance, for it is unique. It is the starting point for a major multi-centred study.

15.0 LESSONS LEARNT FROM THIS STUDY

1. Accidents are more likely to occur during weekends.
2. Pedestrians are more prone to accidents than passengers.
3. Bad roads and rainfall are associated with a rise in road traffic accidents.
4. There are far much more male victims of road traffic accidents than females.
5. Unskilled drivers are more likely to cause accidents than skilled drivers.
6. There is under reporting of road traffic accidents.
7. Road traffic accident victims are at the mercy of “good Samaritans” for evacuation to the hospital.
8. Most accidents could have been avoided
9. The country as a whole is yet to cost the burden of road trauma
10. There is need to improve law enforcement of road traffic rules, its importance and public sensitivity.

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ANNEX 1: CONSENT FORM**THE UNIVERSITY OF ZAMBIA****SCHOOL OF MEDICINE****STUDY ON THE EPIDEMIOLOGY OF ROAD TRAFFIC ACCIDENTS IN****LUSAKA - 1996****CONSENT FORM**

I am aware that this study is a research being conducted by Dr R Kafula who is a Masters of Public Health student at the University of Zambia and that it will form the basis of his dissertation. The main objectives of this study are to identify risk factors influencing the occurrence of road traffic accidents in Lusaka and to make recommendations to relevant authorities on how best to prevent accidents.

I have been reliably assured by the researcher that my answers will be considered strictly confidential. I have also been informed that it will not be possible to identify any one filling in the questionnaire and that my views will not be exposed to either anyone or to any institution.

My participation in this study is voluntary. Withdrawal from the study or refusal to participate in this study will not in any way deprive me of the health care generally rendered to a patient in this institution.

ANNEX 2: QUESTIONNAIRE

THE UNIVERSITY OF ZAMBIA

SCHOOL OF MEDICINE

QUESTIONNAIRE : BY DR R KAFULA { BScHB, MBCHB }

STUDY ON EPIDEMIOLOGY OF ROAD TRAFFIC ACCIDENTS IN LUSAKA

QUESTIONNAIRE FOR ACCIDENT CASUALTIES

Serial no. _____

Since it is hoped to find factual evidence from these questions about road traffic accidents please answer the questions as honestly as you can, and add any ideas or suggestions for improvements. The answers are strictly confidential. It will not be possible to identify any individual filling in one of these forms. Please express your own views and be honest. Your ideas are very important.

Please tick/fill-in where appropriate

1. Sex 1.1. Male

1.2. Female

2. Age (in years).....

3. Marital status 3.1 Single

3.2 Married

3.3 Divorced

3.4 Widowed

4. Occupation:.....

5. When did the accident occur?.../.../96

6. What time did the accident happen?

6.1. 00:01 - 03:00

6.2. 03:01 - 06:00

6.3. 06:01 - 09:00

6.4. 09:01 - 12:00

6.5. 12:01 - 15:00

6.6. 15:01 - 18:00

6.7. 18:01 - 21:00

6.8. 21:01 - 24:00

7. Where did the accident take place?

7.1. Residential

7.2. Town centre

8. Do you know the name of the road where the accident occurred?

8.1. Yes

8.2. No

9. If yes write the name of the road. Also mention such important scenes like buildings, junction, robots, etc. in order to specify the spot where the accident occurred.

.....

10. In what capacity were you involved in the accident?

10.1. Pedestrian

10.2. Passenger

10.3. Driver

10.4. Other

11. What kind of vehicle hit you or were you using?

11.1. Car

11.2. Taxi

11.3. Van

11.4. Bus

11.5. Other

12. If there was a provision for seat belts in your vehicle did you fasten your seat belt at the time of the accident?

12.1. Yes

12.2. No

12.3. Not applicable

13. How would you grade the age of the vehicle.

13.1. New

13.2. Old

14. If the answer to question 11 above is 11.5 what were you using?

14.1. Bicycle

14.2. Motor bike

14.3. Oxy cat

14.4. Not applicable

15. How did you get to the hospital?

15.1. Helped by "Good Samaritan"

15.2. Hitch hiked

15.3 Used police vehicle

15.4 Used government ambulance

15.5 Used public transport

15.6 Walked

15.7 Other (Specify).....

16. What do you think caused the accident?

16.1 Stress of the driver

16.2 Disregard of traffic rules

16.3 Visibility was poor

16.4 Slippery road as a result of rainfall

16.5 Pot holes

16.6 Over loading

16.7 Over speeding

16.8 Not applicable

17. If the answer to the above question is 16.8 specify in your opinion what you think caused the accident:.....
.....

18. In your own words how do you think the accident could have been avoided?
.....
.....

Thank you for participating

ANNEX 3: LETTERS

ANNEX 3a: UTH

26th September 1996

The Executive Director

University Teaching Hospital

P. O. Box RW 1000

Lusaka.

u.f.s.: The Head of Department, Community Medicine

Dear sir,

Re: Request to Conduct a Study on Epidemiology of Road Traffic Accidents in

Lusaka

I am a student at the University of Zambia currently pursuing a Masters degree in Public Health (MPH). I am required to carry out a research project as partial fulfilment of the course.

The main objectives of this study are to identify risk factors influencing the occurrences of accidents and to make recommendations to relevant authorities on how best accidents can be prevented. In order to collect data I need to administer a questionnaire to victims of road traffic accidents who will be attended to at this hospital. The research which will be a prospective study is expected to start in October and last for three months. During that period, a questionnaire will be administered to eligible road traffic victims. The sample size is 450 persons. I would also like to be given authority to look at the patients' files and records to enable me complete data collection. I have attached a copy of my proposal for your information. Any assistance rendered will be greatly appreciated.

Yours faithfully,

Dr R Kafula

MPH Student

ANNEX 3b: ZSIC

4th December 1996

The Managing Director

Zambia State Insurance Corporation

Lusaka.

u.f.s.: MPH coordinator

Dear sir,

Re: Study on Epidemiology of Road Traffic Accidents in Lusaka

I am a student at the University of Zambia currently pursuing a Masters degree in Public Health (MPH). I am required to carry out a research project as partial fulfilment of the course. The main objectives of this study are to identify risk factors influencing the occurrences of accidents and to make recommendations to relevant authorities on how best accidents can be prevented.

In order to collect data I need to conduct an interview. I would also like to be given an opportunity to examine the reporting system to enable me capture data for computer analysis. Information obtained from your office will be considered strictly confidential.

I have attached a copy of my proposal for your information. Any assistance rendered will be greatly appreciated.

Yours faithfully.

Dr R Kafula

MPH Student

ANNEX 3c: Road Traffic Commissioner

4th December 1996

The Commissioner

Road Traffic Commission

Lusaka.

u.f.s.: MPH coordinator

Dear sir,

Re: Study on Epidemiology of Road Traffic Accidents in Lusaka

I am a student at the University of Zambia currently pursuing a Masters degree in Public Health (MPH). I am required to carry out a research project as partial fulfilment of the course. The main objectives of this study are to identify risk factors influencing the occurrences of accidents and to make recommendations to relevant authorities on how best accidents can be prevented.

In order to collect data I need to conduct an interview. I would also like to be given an opportunity to examine the reporting system to enable me capture data for computer analysis.

Information obtained from your office will be considered strictly confidential. I have attached a copy of my proposal for your information. Any assistance rendered will be greatly appreciated

Yours faithfully,

Dr R Kafula

MPH Student

ANNEX 3d: Meteorological Department

2nd January 1997

The Director

Meteorological Department

Lusaka.

Dear sir,

RE: REQUEST FOR DAILY RAINFALL RECORD FOR LUSAKA

I am a student at the School of Medicine currently pursuing a masters degree in public health. I am required to carry out research project as partial fulfilment of the course.

The title of my research is "Epidemiology of Road Traffic Accidents in Lusaka". The main objectives of this study are to identify risk factors influencing the occurrences of accidents and make recommendations on how best accidents can be prevented. In order to collect data

I need to inquire from your office daily rainfall recordings, for a period of three months starting from 12th October 1996 to 11th January, 1997 for Lusaka.

I am scheduled to be in Lusaka from 13th to 16th January 1997. The purpose of this mail therefore is to notify you about my intended visit to your office and seek authority to obtain the said statistics. I have appended a copy of the study protocol for your perusal.

Any assistance rendered will be greatly appreciated.

Yours faithfully,

Dr R Kafula

MPH Student

ANNEX 3e: ZP

10th January 1997

Inspector General of Police

Zambia Police Service

Lusaka.

Att: Mr F Musonda (Service Spokesman)

Dear sir,

Re: Epidemiology of Road Traffic Accidents in Lusaka

I am a student at the University of Zambia currently pursuing a Masters degree in Public Health (MPH). I am required to carry out a research project as partial fulfilment of the course. The main objectives of this study are to identify risk factors influencing the occurrences of accidents and to make recommendations to relevant authorities on how best accidents can be prevented.

The study period is from October 12th, 1996 to January 11th, 1997 (tomorrow). I have had opportunities to interview Mr L. Ngoma and the commanding officer for Lusaka. I was advised to find out from your office what proportion of accidents occur in Lusaka in relation to the national levels and whether you have observed any increase or not. I will (in person) re-confirm my appointment with you on Monday next week. Any assistance rendered will be greatly appreciated.

Yours faithfully,

Dr R Kafula

MPH Student

ANNEX 3f: UTH

21st February 1997

The Executive Director

University Teaching Hospital

P. O. Box 50001

Lusaka.

Dear sir,

Re: Cost of Treating Road Traffic Accident Victims

I wish to thank you for allowing me to conduct the study at the hospital. I am finalising my dissertation in a couple of days. I would like to be assisted with an estimated total cost in Zambian Kwacha of treating the following number of victims of road traffic accidents who were seen at the hospital:

During the study period from 12th October, 1996 to January 11th, 1997, there were 993 patients seen at the casualty wing. 158 were admitted; 39 were discharged and only 10 were recorded as brought-in-dead (BID). At the moment I am interested in the total cost of providing such a service to road traffic accident victims at UTH.

Sir, I will pass through your office on Monday to formally conclude the study at UTH.

Thanking you in anticipation.

Yours faithfully,

Dr R Kafula

MPH Student

ANNEX 4: CHECKLIST

ANNEX 4a: INTERVIEWEE: ZSIC

1. How many Road Traffic Accidents were recorded between October 12th 1996 to January 11th, 1997 (3 Months)?

NB: Subjects should include: Sex, Age, Time of Accidents, Location, Capacity of Victim (driver, Passenger, Pedestrian)
2. How many accidents were reported as:
 - a) No injury at all;
 - b) Slight/serious injury;
 - c) Death.
3. How is the reporting done e.g. How are you notified that there is an accident?
4. Does the reporting form indicate cause of accident?
5. Why do people opt for either third party policy or comprehensive policy?

Have you seen any trend in the preference of one form of policy to the other?
6. How many claims were paid on own damage to insured vehicles in the said three month period.
7. How many claims were paid to third party property damage as a result of road traffic accidents.
8. What was the value of third party property damage claims in the said period.
9. What was the value of damage of own insured claims from October 12th 1996 to January 11th, 1997?
10. In your own vast experience with the insurance corporation what do you think are the main causes of accidents?
11. How can these accidents be minimised?
12. Does the corporation invest anything in prevention of accidents? If so, what is it?

ANNEX 4b: INTERVIEWEE: ZAMBIA POLICE

1. How many Road Traffic Accidents were recorded (day by day) between October 12th, 1996 to January 11th, 1997 (3 months)?

NB: Subjects should include: sex, age, time of accidents, location, capacity of victims (driver, passenger, pedestrian, cyclist)
2. What proportion of accidents occur in Lusaka out of the national total? It was reported in 1985 that it was 25%. Has it changed?
3. How many reported accidents were reported as:
 - a) No injury at all
 - b) Slight/serious injury
 - c) Death (or BID)
4. Of the drivers who were involved in the accident how many were male or female?
5. What was the age distribution?
6. What was the sex ratio of the drivers?
7. If there was an accident anywhere in Lusaka whose responsibility is it to ferry the sick/dead to the hospital/mortuary.
8. Is there any law to support this (Question 7)? Who is empowered by law to evacuate the victims?
9. How is reporting of accidents done. How are you informed that there is an accident?
10. In the past we used to see patrol traffic officers (on motor bikes), why have they stopped?
11. Since the fines were imposed, has there been any effect on the pattern of accidents? I think the fees are too high e.g. seat belt - K180,000. Don't you think if it was K10,000, and the police were allowed to charge and collect cash from drivers, the culprits would comply?
12. Who is the beneficiary of the fines (fees)? Don't you think if collection and utilisation

of monies, and introduction of a commission (or bonus) like is the case with medical fees in the health sector, would encourage your men and motivate them to arrest the situation?

13. What proportion of drivers (culprits) were pardoned or warned, fined (note: total number in October, November 1996 and January 1997), referred to the magistrate court or where hit and run.
14. In your own experience what do you think are the main causes of accidents and how can they be minimised?
15. What sort of activities or resources does the police force invest in accident prevention?

ANNEX 4c: INTERVIEWEE: ROAD SAFETY COUNCIL

1. What is the role of the Road Traffic Safety Council?
2. Which acts empower the police to enforce the law?
3. When I was going to Zimbabwe by road I was warned that I should observe the speed limits. Why there? Why is this not the case in Zambia?

Why is the drivers' attitude so "I don't care" when the law is very clear?
4. Why can't we have road signs warning drivers in highways or intercity to reduce speed?
5. If there is an accident whose responsibility by law is it to evacuate the injured or remove wrecks?
6. It is generally reported that wrongly parked vehicles are a some of main objects where on coming vehicles ram into. Whose responsibility is it to remove those vehicles?
7. Is there any way in which you are notified that an accident has occurred? If so how?

What are some weaknesses and strengths of the system?
8. Do you receive any statistics on the occurrence of accidents? If so, what is the pattern like in terms of age, sex, location, capacity(driver, passenger, pedestrian), hit and run, cause of accident?
9. What was the outcome of the accidents:
 - Total accidents
 - Injured persons (Slightly, Serious, Deaths - BID)
10. What proportion of these where hit and run?
11. What proportion of the total accidents in Zambia occurred in Lusaka?
12. Why don't we see traffic wardens these days?
13. From your experience what do you think are the major causes of accidents? How can they be minimised?
14. What is the police doing to try and minimise accidents?

ANNEX 5: SELECTED INTERVIEWS

a. Zambia Police Service

The commanding officer was interviewed to find out more details on road traffic accidents. He conceded that the fines imposed by the road traffic commission had no impact on the reduction of accidents in Lusaka and agreed that if the money collected from motorists was utilised or channelled back to the Police Service, it would go a long way in motivating the police patrol officers and overcoming some of the problems faced by the Ministry. In his view the problems faced by the Police are universal to every government institution. They lack basic logistics to conduct routine patrols in highways and residential areas.

There is no law in Zambia that compels any institution or statutory body to evacuate the victims of road traffic accidents. By convention the public has come to accept that it is the job of the police. He, however, pointed out that anyone has the responsibility to offer assistance to the injured.

Contributing factors to the high rise in number of accidents nowadays are:

- a. congestion of roads caused by a high number of vehicles
- b. poor road network
- c. narrow roads and
- d. incompetent drivers.

He concluded by recommending that the only cost effective preventive measure to address the current road carnage was through health promotion.

b. ZSIC

There are 6 insurance companies in Lusaka. Sixty percent of the total clientele are registered with ZSIC. The managing director was interviewed to find out more information on road traffic accidents. According to the records at the corporation, causes of accidents were:

- a. carelessness
- b. drunken driving
- c. vehicles which were not road-worthy
- d. inexperienced drivers
- e. misjudgement of distances
- f. slippery roads and
- g. over speeding.

In his view the managing director proposed the following to minimise road traffic accidents:

- a. stiffer penalties for culprits
- b. public awareness campaigns on safe driving and
- c. enforcement of regulations.

He agreed that it would be in the nation's interest to channel the money paid in form of claims to primary prevention.

c. **Road Safety Council**

The commissioner of road patrol referred all queries to the director of road safety council whose major task is to promote road safety. What came to light was that they are facing similar problems as the police. He pointed out that it is time something was done to change the behaviour of road users in Zambia. The director revealed that it has been very difficult to implement the regulation of inspecting vehicles for fitness at regular intervals. Ideally a new vehicle is supposed to be inspected after five years.

In his view the problem of accidents should be approached in two phases namely short and long term measures.

Short term measures would include the following:

- re-introduction of traffic wardens for school children.
- certain percentage of the coverage in all print media and electronic media should be dedicated to road accidents.
- encouragement of a wide range of public and private sector institutions to get involved in road safety programmes especially through community radios.
- awareness campaigns on the financial and social implications of accidents especially motorists.

He reiterated the sentiments expressed by the police commanding officer that there is no legislature in Zambia which compels any one to ferry the injured. He conceded that the legislation concerning road safety is weak and has fallen behind development in the motorisation of Lusaka. This has been due to lack of appreciation of the negative effects of accidents on the socio-economic development of the country. In order to redress this problem, the director recommended the following **long term** measures (over a period of 10 years):

- revision of legislation to suit current trends in motorisation with stiffer penalties;

- fines should be collected and re-channelled to the police services;
- develop a well equipped and efficient enforcement structure to ensure users adherence to traffic laws;
- set up cost effective and efficient methods of data collection in road accidents;
- carry out regular evaluation to check the effectiveness of control measures;
- reconstruct black spots;
- set up a research unit on road safety;
- develop road safety measures and exchange experiences with local and regional or international authorities.