INSTITUTIONAL CAPACITY AND DISASTER PREPAREDNESS FOR

PRE-HOSPITAL CARE:

A Study Of Emergency Medical Response to Road Traffic Accidents (RTA's) in Nairobi.

BY

[RUHIU M. NDIRANGU
C/50/P/8957/1999

A PROJECT PAPER SUBMITTED IN PART FULFILMENT FOR THE DEGREE OF MASTER OF ARTS
(SOCIOLOGY: DISASTER MANAGEMENT)
UNIVERSITY OF NAIROBI.

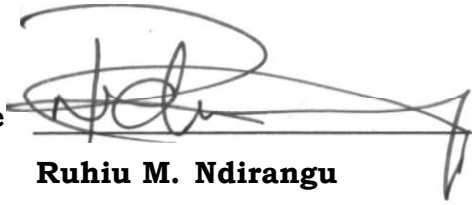
Supervisors:

Dr. R Ocharo

Mr. J Njoka_

DECLARATION

This project paper is my original work and has not been submitted in any other University for the award of a degree.

Signature  **Date**: Q 1 ^ OCT" 3OO3>

Ruhiu M. Ndirangu

C/50/P/8957/1999

This project has been submitted for examination with our approval as University supervisors.

Signature: **Date:**

Dr. Robinson Ocharo

Department of Sociology **University of Nairobi**

P.O. BOX 30197

Nairobi, KENYA

Signature;  **Date:** 30/10/03

Mr. John Njoka

Institute of Development Studies

University of Nairobi

P.O. BOX 30197

Nairobi, KENYA

Dedication

To my mother, Christine Nyakio Ndirangu, whose fortitude I have yet to find an equal.

Acknowledgements

I would like to appreciate the support I have received during the entire duration of my MA programme and particularly in compiling this project paper.

Colonel C Lewela, Base Commander, Moi Air Base, for affording me the opportunity to attend this course while I held the busy office as his principle assistant. Dr R Ocharo and J Njoka for so ably supervising me on this project and offering me invaluable advise throughout. My colleagues in the course, for their constant encouragement and support. Tata B for all the web-based research and literature. Mugure who linked all those miles and made them seem so near. Lt Col S Nyamwaya for having the courage of embarking on the journey with me. J Mwende for the psych.

Lastly but most importantly to Mfalme for giving me the time off and to Waruguru and the rest of my family for the faith and support.

ACRONYMS

AAR - Africa Air Rescue

AMREF - Africa Medical Research Foundation

CISM - Critical Incident Stress Management

CPR - Cardio Pulmonary Resuscitation

DPH - Department of Health

EMS - Emergency Medical Services

EMT - Emergency Medical Technicians

FEMA - Federal Emergency Management Authority

FGD - Focus Group Discussions

FIRESCOPE - Fire-fighting Resources of Southern California Organized For Potential Emergencies

GPS - Global Positioning System

ICRC - International Committee of the Red Cross

ICS - Incident Command System

IMC - International Medical Corps

KNH - Kenyatta National Hospital

MCI - A Multiple Casualty Incident

MoH - Ministry Officer for Health

NCBD - Nairobi Central Business District

NCC - Nairobi City Council

NHTSA - National Highway Transportation Safety Administration

NOC - National Operations Center

OP - Office of the President

PVO- Private Voluntary Organizations

RTA - Road Traffic Accidents

USA - United States of America

TABLE OF CONTENTS

List of tables and charts

CHAPTER ONE

INTRODUCTION

The occurrence of disasters is increasingly drawing attention as the world grapples with the effects that disasters have on the global economy as well as individual countries. The dollar losses of disasters continue to increase annually and minimizing the effects of disasters has become a major objective of most governments. Many governmental and non-governmental organizations are now actively involved in the intervention at the various phases of disaster management, namely, mitigation, response, recovery and reconstruction. Vast resources have been utilized in managing disasters at any one of these levels. Lack of proper disaster management is attributed to having an impact on the development of a nation as a whole.

Disasters vary from small community disasters to large catastrophic cases such as massive earthquakes and hurricanes as recently experienced in Turkey in 1999. The ability of a community to cope with a disaster will have a big effect on the ability of a nation to cope with a catastrophe. It is therefore sensible to start disaster management institutions at the smaller community level before embarking on the more ambitious and complicated national level disaster response plan. The inability of a city to cope effectively with a road traffic accident will reflect negatively on the country's ability to handle bigger disasters.

Disasters are generally viewed as low probability events and there is a general apathy towards them. They compete for attention with the priorities of daily living. Getting the public, elected officials and other leaders to support disaster preparedness is just as difficult as developing the disaster counter-measures themselves. This is particularly true in

the case of a country like Kenya where the resources are limited and the general day-to-day problems overwhelm the government. According to Drabek(1987:176), one of the social realities to be faced in disaster planning is that the general attitude towards disaster preparedness is characterized by both official and public apathy. Therefore, a plan must understand the causes of the apathy. In Kenya, public apathy as well as economic constraints is reflected in the lack of political support for disaster preparedness. Programmes have to be mandated by law and funded by the government. "Even when governmental bodies have adopted goals for disaster preparedness, the resources necessary to accomplish the goals have not always been available"(Drabek 1986:386).

A study by Westgate (2000:7) that proposes a programme for the execution of a national disaster management program in Kenya reveals that Kenya has no policy framework, no unifying legislature and no national plan for disaster management. Disaster management provision can be found scattered among a wide range of different statutes and laws. It further states that disasters tend to provoke short-term emergency response that appear to be forgotten until the inevitable next crisis occurs. This fatalistic response to disasters suggests that they are thought to be acts of God or that they arise from "environmental processes too great or too complex to do anything about. Lacking motivation to anticipate and deal with the long term consequences, disasters can steadily degrade a society's stability". Yet, by analyzing the research and study's done on disasters in the past, lessons can be learnt. These comparative studies are important because we are able to determine what disaster characteristics and problems are recurrent regardless of the location, type, size rapidity of onset, and duration of the disaster (Reynolds 1976:2,3,16).

In the case of road traffic accidents (RTAs) in Nairobi, however, their regular occurrence and their seriousness are guaranteed. Therefore the major constraints in planning for emergency medical response such as apathy should not arise and planning for them should not appear far-fetched. The complacency towards preparedness is probably the mistaken belief that the accidents can be managed merely as an extension of routine emergency measures. This is where the government has the false illusion that it does take appropriate action by mobilizing hospitals, the police and the military to respond to mass traffic accident casualties around the country as soon as the community's resources are overwhelmed

This study carried out an analysis of the participation of NCC Ambulance Services in the management of emergencies in Nairobi. It further assessed its role in responding to RTAs within and around Nairobi. This is a government-funded service that should typically be involved in such activities without considering budgetary constraints. The study will also review how victims are triaged so that the most urgent cases are prioritized.

1.1 Problem Statement

In Kenya and Nairobi in particular, the once common sight of ambulances zooming with sirens blaring to an accident site is all but forgotten, except for the occasional private ambulance responding to a distress call by a private subscriber. The terrorist attack in the central business district of Nairobi on August 7th 1998 clearly demonstrated the lack of preparedness of the city ambulance services to handle an emergency situation of that magnitude. Whereas the magnanimous nature of Nairobi residents was evident, possibly many more lives could

have been saved and injuries better attended to had there been a better coordinated emergency medical response in place.

The total confusion and scenes of emergent behavior typical of a disaster scene with good Samaritans doing all they could to tiy and save lives will forever be etched in the minds of all who watched the disaster unfold. The confusion that further ensued at the hospitals with the staff unsure of who to admit and who to lock out added to the confusion and lack of preparedness. While it is safe to say that the devastating effect of the blast and its consequences could have stretched even the most organized city, it was apparent that Nairobi does not have a well coordinated emergency medical response plan and that a similar disaster today could lead to the same consequences. Little has been done to utilize the useful lessons learnt from that experience.

The Kenyan police are able to respond to accidents fairly quickly and are normally the first people at an emergency. However, what procedures are followed after their arrival? Are the victims prioritized according to their injuries and are there qualified people to perform triage? Inadequacy of triage measures on the scene often leads to wrong decisions being made on what to do with the victims, where to take them for further medical attention and what mode of transportation to use. Needless to say, a lot of lives are lost and injuries aggravated by this kind of disorganized approach to emergency medical response (Heide, 2000: online).

Research has shown that majority of victims arrive at the hospitals by means other than ambulances and rescue vehicles. According to Quarantelli, the researchers noticed a strong tendency for police officers to load victims into whatever vehicles were handy and to send them off to the hospitals. " In one disaster, for example, police loaded 26 injured

persons into three non-ambulance vehicles, and these were the first to arrive at the hospitals. Some disaster plans call for a delay in evacuation of the victims from the scene so they can be triaged for orderly and rational field stabilization and transport. Other plans called for the use of field first-aid stations to alleviate the burdens of the hospitals (Quarantelli, 1983:170).

This research aimed at studying and reviewing the considerations needed for the creation of an emergency medical response service as well as analyze any existing emergency medical response plan, if any, in relation to a major multiple casualty incidence, specific to Road Traffic Accidents (RTAs) of a serious nature in the city of Nairobi. As comparators, other disasters have been cited as a reference point with the aim of justifying the study. The study undertook an exploratory nature and focused on assessing the NCC's capacity to cope with responding to RTAs in Nairobi. In the final analysis, the study attempted to establish the deficiencies of the response system in place and highlight areas where efficiency can be enhanced to ensure its sustainability.

The study was therefore guided by the following questions:

1. What is the role of Nairobi City Council (NCC) to the government and the residents of Nairobi as far as emergency medical response is concerned?
2. Does NCC have the institutional capacity to respond to RTA victims, flood victims or other disasters?
3. Does the public have sufficient knowledge and information on services provided by NCC?

1.2 Objectives

1.2.1 Broad objectives

The overall aim was to review the institutional capacity and disaster preparedness of the Nairobi City Council Ambulance Services to provide pre-hospital care within Nairobi city. Specifically, the study assessed the capacity of NCC Ambulance Services as a health service provider mandated with the responsibility of responding to medical emergencies in relation to multiple casualty traffic accidents in Nairobi and its environs.

1.2.2 Specific Objectives

The study attempted to address the following specific objectives:

=> To establish the number of road traffic accidents in Kenya in general and Nairobi in particular where life and limb were lost in 1999-2002

=> To establish the role played by the NCC Ambulance Services in responding to the traffic accidents in Nairobi

=> To review the institutional capacity both human and capital at Nairobi City Council Ambulance Services

1.3 Scope and Limitations

This study was limited to the Emergency Medical Service of the NCC Ambulance Service. The council is responsible for providing the residents of Nairobi with emergency services in the cases of accidents, fire and general health requests and has the mandate to provide adequate and effective services to all the residents needs.

The study was conducted in Nairobi due to the fact that the city is more prone to disasters as compared to any other town in the country. It is also due to time and financial constraints that the study only focused on the NCC Ambulance service. However, the data available was adequate to facilitate the study.

The study was limited to the institutional capacity of the NCC Ambulance service to offer emergency medical response services whenever there is a disaster or related mass casualty accident, specifically road traffic accidents in Nairobi and the surrounding areas. It concentrated at the NCC Fire Station where the ambulance services are co-located. It is a public funded facility whose primary objective is to provide fast and efficient response to all casualty related incidences in Nairobi.

1.4 Rationale

Concern about disasters is becoming increasingly relevant as increases in population density; population shifts and technology make it likely that disasters are encountered more frequently. The terrorist bomb-blast in Nairobi in 1998 raised questions as to how the city would cope with a disaster of such a magnitude should it occur again in the future.

The 1998 case placed the NCC Ambulance and medical services in the spotlight as a service that is expected to lead medical emergency operations in the city whenever a disaster occurs. It showed how ineffective such a facility was in handling large-scale casualty accidents and disasters. The sight of victims lying everywhere and volunteers doing all that they could without any professional direction, exposed the lack of planning for disasters in the city. These are issues that need to

come to light whether they were due to human negligence or the incapacity of the institution in terms of lack of resources and personnel.

The government has a direct responsibility to ensure the safety of its citizens. The citizens also have delegated to their government the trusteeship of their safety among other social contracts. The question of not having some basic services rendered should therefore not arise and a government's success or failure should be measured using this yardstick. All government policy should be weighed by the effect the policy has on the citizens. This study highlights the state of the city's emergency medical response service and will make recommendations in the establishment of an effective program to handle RTAs in the future. It also attempts to shed some truth on the actual capacity of the NCC and this will go a long way in improving the services rendered once the situation has been established.

CHAPTER TWO

LITERATURE REVIEW AND THEORY

2.1 Background

Throughout history disasters have inflicted a heavy cost in human, material and physical resources as well as damage to the environment. They represent a potentially significant obstacle to economic growth and development. A community can achieve no meaningful development if it is vulnerable to disasters.

According to the Green Paper of South Africa, adequate procedures to deal with disaster situations and relief measures must be planned prior to an event, with strong legislation to empower those responsible to carry out the tasks. It is not enough to assume that a hospital is well equipped to handle casualties if no plan is in place to cover all aspects of disaster management from the scene of the disaster to the hospital itself.

Regular training must be conducted and careful planning must be in place to co-ordinate the effective use of resources, both human and physical, for the saving of lives and property, limiting damage to the environment, and the return to a normal life as soon as possible (p3).

Fundamental developments have taken place in disaster management. Disasters are no longer considered as fatalistic, unavoidable 'acts of God' but rather as foreseeable and preventable events. Those who provide assistance today do not do it as a gesture of sympathy or charity but as providing a right to the affected persons. Health is no longer perceived as a luxury but as a basic human right. The community no longer views

disaster aid as an *ad-koc* repair act but as an essential factor in long term development of any nation.

According to Heide (1996: 61), "The history of disasters is rife with unsung heroes, sacrifice and remarkable improvisation under conditions of extreme duress and uncertainty. In many cases the difficulties are "system problems" not problems with individual behavior or effectiveness. They reflect the fact that organizations evolve to take care of common community problems. Disasters, however, pose unique problems often different even from the more routine emergencies that police fire, medical, and other emergency organizations face on a day-to-day basis. Accordingly, the everyday emergency systems are not always well adapted to tackle disaster problems".

Drabek(1968: 121), further illustrates that there is a marked difference in organizational planning for day-to-day emergencies and planning for post disaster community responses. Because many organizations handle miniature emergencies daily, they believe they are prepared for large-scale events. If more personnel are needed, they can be obtained. This view fails to recognize important qualitative distinctions and changes in the task environment associated with large- scale disasters. Disasters do not constitute a simple straight-line extension of an auto accident or house fire.

2.2 Polish Medical Rescue Systems. Pre-hospital and Disaster Medicine

The Polish example is very similar to the Kenyan situation and a study conducted there brings out glaring comparisons that can help in the analysis of the Kenyan situation. Mortality due to acute, life threatening conditions is very high in Poland. In a study conducted at Wroclaw

University of medicine, trauma was found to be the leading cause of death for people under the age of 44 years. Per trauma mobility rate from road accidents is 14%. In the older generation, coronary heart disease is a major cause of death. The average length of life in Poland is 67.5 years for men and 76 years for women. The study found that one of the main reasons for these unfortunate circumstances is the lack of a properly organized emergency medicine system. In Poland, the emergency medicine system is monopolized by provincial primary care stations, which are working without structural and administrative co-operation with hospitals. The hospitals do not have regular emergency departments with dedicated and specialized personnel.

The emergency structure for Wroclaw city and province is based on one Provincial Primary Care Station with seven local first aid stations, fire rescue ambulances, three pediatric ambulances and nineteen general ambulances. None of the local hospitals possess an emergency department with specialized emergency nurses and doctors. As a result, overall mortality in emergency cases is very high in this region.

A quick assessment of the medical system in Nairobi revealed that it is ill- prepared to a much greater extent than the Wroclaw situation and that the lack of a local, regional or provincial programme of disaster preparedness would easily overwhelm the city and force people to self-defense and imposition of all types of rescue activities as is seen today.

According to the **Daily Nation(March 8 2001),** an analysis by the government, local and international agencies and the medical community have shown that there is limited know how and capacity for authorities to respond to major disasters in Kenya. This was obvious during the August 7, 1998 bomb blast, where the quality of pre-hospital care provided by the first responders (public and police force) and ambulance

services was found to be lacking and inappropriate. This had serious impact on the general outline of injuries.

A report by the International Medical Corps (IMC), who later embarked on a major program to provide Kenya with the necessary capacity to effectively deal with disasters, (the success of the programme is yet to be seen), first responders had limited training if any, in basic first aid, Cardio Pulmonary Resuscitation (CPR), extrication and stabilization techniques, incident command system and mass handling casualties. Further, nursing and medical schools in Kenya do not fully address resuscitation, trauma or basic first aid. Most civil and medical authorities lack disaster preparedness programs or contingency plans for in-house response to mass casualty incidents.

When a disaster strikes, the general population expects public service agencies and other branches of the local, state or federal government to rapidly mobilize to help the community cope. Preservation of life and health are of paramount importance to those individuals affected by these disasters. For this reason, medical professionals must be included in all phases of disaster planning as well as in the immediate response to these events.

The typical response of the government after a major disaster has occurred and has overwhelmed the community's' response resources, is to declare a disaster and instruct government hospitals, police and the military to use all the resources at their disposal to assist the affected people. This response is normally started when the situation has got hopelessly out of hand and a lot of time has been wasted. Needless to say, the rescue operation also ends up using more resources than would have been necessary had there been a plan in the first place. The many organizations involved in the response effort have no familiarity of

working together and it is difficult to form a well-coordinated response. It is clear that the police are able to respond to accidents fairly quickly and are normally the first people at the site.

In the case of RTAs, efficient response requires procedures for triage and casualty distribution. According to Bowers (I960), triage has been called the keystone to mass casualty management. Triage comes from the French word *trier* which means "to sort". It evolved perhaps as early as Napoleons' time, as a technique for assigning priorities for treatment of the injured when resources were limited. The basic concept is to do the greatest good for the greatest number of casualties. Generally, attention is given first to those with the most urgent conditions and to those who are the most salvageable. (Rund 1981:3). This technique is essential for good disaster medical care. It works well when practiced on a regular basis in the daily routines that the emergency medical responders go through.

A good example is the emergency medical services system in Sacramento County, California. The standard practice there is for emergency medical technicians on the ambulance to assign a triage category for every emergency patient transported on a daily basis. This becomes a part of the radio report to the hospital. The result is that both the emergency medical technicians and hospital personnel become familiar with the triage system. In essence, they have a daily triage drill (Lowry, 1983).

The study reviewed in relation to the typical Kenyan scenario, how, if any tnage is carried out and whether prioritizations of the victims' needs are done. Lack of triage often leads to wrong decisions being made on what to do with the victims, where to take them for further medical attention, and by what mode to take them by. Needless to say, a lot of lives are lost and mjuries aggravated by this kind of disorganized approach to

emergency medical response. According to Drabek's (1995:3) disaster on aisle 13. where an explosion took place in a crowded coliseum in Indianapolis, "victim dispersal from the explosion site was a key task that was not well coordinated. Some key tasks were duplicated needlessly, while others were neglected. Personnel tended to rely heavily on internal resources rather than seeking assistance from other organizations. These observations underscored the importance of preparedness planning rooted within a community wide perspective. They illustrated a fundamental axiom: the emergency response effectiveness of any single agency is directly dependent on the level of coordination within the emergent multi-agency network."

2.3 How to Maintain Preparedness

Successful medical management of major accidents or disasters requires adequate and efficient preparedness. Assessment of risks in relation to material and personnel resources, efficient planning, medical response tacdcs and continuous training of the staff including a sufficient amount of field exercise involving various rescue teams can maintain preparedness. Risk assessment is necessary to identify types of accidents that may take place within the area where the medical services are provided. Traffic accidents happen most commonly on the road but may also occur on the railway, boats and during air travel. Industries that use hazardous materials as well as in their transportation within the area may create risks that need to be taken into account in advance. Also, fires in densely populated housing areas or in large building like hotels and office blocks must be considered.

The personnel and the materials that are available for medical rescue and management of accidents need to be assessed regularly. According to Heide (2000), prompt response to a call for help can be made when the

lists of both official and volunteer rescue teams and the means to activate them are well maintained. The vehicles available for transportation of the medical personal to the scene as well as of the patients to the medical facilities must be recorded. First Aid and various medical materials that can be delivered readily to an accident scene must be identified.

Concise and coordinated advance planning makes it possible to activate rapidly all available medical staff independent of what time of day or week. Well-prepared rescue plans take into account different types of emergencies so that teams can perform their work without delays. Planning must also consider how communication at the site of the accident and onward to the successive health care units, can be maintained.

According to Heide 1999, 'preparedness for moderately sized disasters may be more realistic and achieve greater acceptance by those who must pay (read the government) for and carry out the preparedness' (pi6). The advantage of a focus on moderate disasters is that the procedures involved are more likely to be used and therefore learned. They are also more likely to get funded. Furthermore, the skills, training, procedures and supplies developed for moderate disasters are a logical step towards preparedness for larger events. It is therefore easier to sell planning for a multiple vehicle accident than for an earthquake.

Quarantelli adds that medical personnel can maintain their professional skills by managing patients whose care is similar to those who are treated at sites of accidents e.g. personnel who work at the casualty departments. However, working outside of a hospital in makeshift shelters for the provision of first aid or in open air is very demanding, edical care in the field can be improved by sending the personnel to

true accident sites and by field exercise' training, which the medical rescue teams deal with simulated accident types. Only simulated accidents can provide an authentic possibility to train triage since accidents with mass casualties are very rare.

All rescue teams, fire departments, police, medical personnel etc must work as a team at the accident site to promote the rescue of casualties and provide their medical care at the site and during their subsequent transportation to medical facilities. This teamwork or coordination is of crucial importance in order to save the critically but not fatally injured victims. Drabek states that quick initiation of simple medical intervention needs to be concentrated on the patients who are expected to be revivable (expected to live), and the rescue teams should cooperate efficiently to locate, recover, treat and transport these patients (triage). Field training of all rescue teams in simulated accidents provides valuable experiences that can save the lives in true mass casualty situations (1981:35).

2.3.1Training methods

Every major accident or disaster is unique and not similar to another. However we are expected to manage accidents and disasters quickly and efficiently, minimizing the loss of human life and expenses. This is possible by:

I) Analysis- Many things can be learned from a major accident/disaster. Therefore it is important that every accident/disaster is analyzed and evaluated very carefully and the results of each study distributed and shared. A collection of lessons learned could be used as a basis for identifying areas for improvement in future interventions, as well as serve as reference material.

II) **Exercise-** Training and exercises related to emergency response such as first aid, trauma, CPR etc. are crucial and should be performed both in a classroom setting as well as alarm calls in the field to provide realistic situations. Further, it is imperative to have technical personnel involved in such training such as the police force, fire and ambulance services. Familiarization tours should also be encouraged with respective partners such as hospital casualty/emergency units, the fire station, police stations etc. This in effect, psychologically prepares those in training on what to expect in the event of a crisis.

III) **Experience-** it is important that the persons expected to handle a major accident/disaster have gained experience from their daily work with minor accidents. Although major accidents /disasters are different and more complex than minor ones, certain patterns are the same, and therefore, persons with experience and training will be better equipped to cope with the next disaster.

In an article by Ken Opala, he states, "authorities response to disasters has been *ad hoc* and pathetically ineffective..."

An effective disaster management system to monitor, warn and react to distress signals countrywide is yet to be set up despite the litany of calamities that have devastated Kenya. On the ground are *ad hoc* committees, often hurriedly appointed to manage specific disasters on a case-to-case basis, but do not reflect and more importantly draw up strategies to provide guidelines for future interventions. Some disasters that were carried out in this nature include the Mtongwe ferry, El Nino floods and the August 1998 bomb explosion emergencies.

The *Kyanguli* school fire disaster was no exception. There were no fire fighters. A lone ambulance shuttled between the school and the Kenyatta National Hospital (KNH), a distance of about 80 kilometers and by 1pm it had transferred only seven survivors.

Conspicuously absent were private medical rescue units - such as AMREF, flying doctors service - famous for moving fast against any eventualities with fleets of aircraft ambulances. Even the Kenya Police and Military aircraft were not part of the salvage effort.

According to an official of the international committee of the Red Cross the *Kyanguli* rescue exercise was 'uncoordinated' because government lacks the means to respond to any disaster distress. By 11.30 a.m., the Office of the President (OP) was still awaiting details of the fire. "We are still waiting to be told what the victims need," said an official at OP. Is there a stand-by response committee? "We depend first on the community, if they fail to cater for themselves, we move in" he added.

The government, conscious of its ineptitude and inability to respond adequately to disasters, was by 11.30a.m yet to seek assistance from specialized private organizations including the International Committee of the Red Cross (ICRC) and the Red Cross society. ICRC only came to know about the gruesome incident at around 11am about 10 hours after it happened. The gruesome killing at *Kyanguli* Secondary School is further indictment of a government not in a hurry to protect its vulnerable citizens.

2.4 Emergency Medical Systems

in an article by Dr Sayah of the National Association of EMS physicians, the history of EMS extends back to the biblical story of the Good Samaritan. Accounts of ancient wars reveal many examples of organized methods of transportation and care of the sick and injured.

Historical archives suggest that Caesar designated battlefield medics among his troops. Napoleon's chief surgeon developed ' *les ambulances volantes',* consisting of horse- drawn wagons staffed with battlefield care-givers. Similar systems commonly operated by hospitals and funeral homes were used in various America cities soon after the end of the civil war.

It was not until the late 1960's to early 1970's that the modern era of EMS was created, with coordinated transport and pre-hospital interventions, to provide earlier, more intensive care to the communities in the United States.

The United States (U.S) congress enacted the emergency medical services systems Act of 1973 (public law 93-154), which funded and authorized the department of Health, education and welfare to develop EMS systems throughout the country.

Public law 93- 154 identified the following 15 components as essential to an EMS system:

-Communication	- Transfer of care
-Training	. Consumer participation
-Manpower	. Public education
Mutual aid	. public safety agencies

-Transportation
-Accessibility
-Facilities
-Crucial care units
- Standard medical records
- Independent review and evaluation
- disaster linkage

The Nairobi City Council, has not been fortunate in securing resources to upgrade their systems since pre-independence, however, they have had a measure of preparedness. Much attention has been placed in the core elements of the Council, such as housing, provision of water, and a *laisser faire* attitude in the medical response system. However, it is worth noting that despite the lack of attention or resources, some effort has somewhat been made to meet their obligations in this respect.

Successful EMS systems should be designed to meet the needs of the communities they serve. The state should provide the laws that broadly oudine what is prudent, safe and acceptable. To be effective, EMS systems must be planned and operated at the local level. This is the level where the operators are familiar with each other and their operations. They are also well versed with the resources that they have available to them and the deficiencies that they work with.

Communities need to identify their individual needs and resources, develop funding mechanism and become involved at all levels in structuring the system. A governing body or council should be established to organize, direct and coordinate all system components. Consensus from all involved should be ensured in developing policies and settling disputes.

This study assumed that a basic EMS system, though not formal, does 3ast m Kenya today and primarily analyzed the disaster management Phase of this EMS system.

The EMS system is an internal element of disaster preparedness and planning. It plays an important role in initial response and transportation of casualties and is essential in establishing a regional disaster preparedness plan in coordination with public safety agencies, government and the medical community. The plan should address disaster management, communication, treatment and transportation of casualties. Periodic disaster drills serve to assess performance, refine management, and educate personnel and the community.

Public support is invaluable in constructing a successful EMS system. Public involvement is required to plan a system that works for everyone. Public education programs are essential in informing the community on mechanisms of accessing the EMS system. They are also important in preparing the public on first aid fundamentals while waiting for EMS. These programs should be coordinated with local public safety and volunteer agencies to project a unified message and achieve maximum impact.

The EMS system must have strong ties with many agencies, which in most cases are the first to respond to an emergency and may provide all or part of EMS care.

The EMS system is only as strong as its weakest component. It should be evaluated continuously and modified to maximize quality, optimize efficiency and minimize cost (National association of EMS physicians' www. emedicine. com).

2.5 Multiple Casualty Incident

A Multiple Casualty Incident (MCI) is an event in which the resources available are insufficient to manage the number of casualties or the nature of the emergency. It is not uncommon for EMS to have more than one patient at a trauma scene. Paramount in all EMS activities is safety, organization and communication. When confronted with multiple patients, these needs are even greater. The major component of EMS response is medical command, triage, initial assessment, standards of care and debriefing.

2.6 Incident Command System

The Incident Command System (ICS) was developed in Southern California in the early 1970's (Campbell, 2000:340). The flexibility of an ICS enables it to be adapted to all types of emergencies including fire, rescue, law enforcement and MCI's. It can be expanded or compressed depending on the complexity of the incident. Its purpose is to prevent independent actions and chaos at the scene of the incident. If an ICS is not established immediately, other rescuers may take independent actions, which will often be in conflict. "Without organization and accountability, chaos will occur and too many people will attempt to command the incident. If you do not control the situation, the situation will control you (Campbell, 2000:342).

One component of the ICS is the medical sector. It includes the medical command, Triage, Treatment, Transport and Staging. (P 343). Each function must be executed and participants need to know their responsibility.

2-6.1 Medical Command

The responsibility of command should be led by one individual who has e ability to coordinate a variety of emergency activities. A team of *Perts to facilitate the various functions of response should in turn

supp0rt the leader. This is the cornerstone of the ICS structure. The person who assumes the role of command is normally the first on the scene and must be familiar with the ICS structure and the other responding rescue vehicles. His core strength should lie in his ability to coordinate and manage the emergency scene. As the response progresses, the role of the command can be transferred as needs arise. It is clear that acquaintance and familiarity among the rescue personnel is paramount if such a system is to be successful.

Once established i.e. after formalizing chain of command and establishing communication lines at the scene and counter-parts including hospitals or other response channels; the medical command should specifically address the following:

i) Assume an effective command mode and position;
li) Transmit a brief radio report to the communication center;
iii) Ensure that proper rescue/extrication services are activated;
iv) Ensure law enforcement involvement as required;
v) Ensure that helicopter landing zone operations are coordinated if required;
vi) Determine the amount and type of additional medical resources and supplies;
vii) Ensure that area hospitals and medical direction are aware of the situation;
viii) Designate assistant officers and their locations;
ix) Maintain an appropriate scan of the scene and control;
x) Work as a conduit of communications between subordinates and the incident commander (www.collegeofparamedics.org).

Other officers involved include staging officers, who ensure that no vehicle congestion occurs and that delays are prevented. He also

controls other agencies and the media. There is also the triage officer, the treatment officer and the transport officer.

2.7 Triage

Triage is a system of identifying patients to prioritize the response to their respective injury. In an MCI the triage goal is to meet the needs of as many individuals as possible by delaying treatment of selected patients, based on priority basis, priority referring to those patients who have the highest possibility of surviving. A triage officer is to spend less than one minute doing an initial assessment to determine the priority of a patient. "It cannot be over emphasized that a triage officer does NOT render any treatment to a patient "(Campbell 2000 pg 344). Once medical priority is determined the triage officer should attach a completed triage tag or any other visual identification technique to the victim and then move to the next victim. The components of initial assessment are focused on life-threatening situations and can be determined by reviewing the general impression level of consciousness, airway, breathing and circulation. This is carried out at the critical stage of an emergency to determine the type of response for immediate action. This initial assessment should aim at:

- Identifying the impact of the emergency, whilst addressing those in life-threatening situations as a priority;
- Identifying other critical casualties;
- Identifying the impact of the emergency to the immediate surrounding environment;
- Identifying capacity for response;

- Identifying gaps not addressed and soliciting support from other entities such as AMREF, Red Cross, Private Voluntary Organizations (PVO) etc.;
- Identifying the most urgent relief needs and potential methods of providing them effectively;
- Making recommendations, which define and set priorities on the action and resources needed for immediate response.

Depending on the duration of the emergency response, it is recommended that daily/periodic operations briefings be carried out to the team. The briefs should reflect any changes in the Plan of Action and immediate work to be carried out. An outline of the operation briefing should include:

- New developments in the situation;
- Any changes in the objectives of the mission;
- Daily work programme;
- Any changes to team organization and individual assignments;
- Team movements;
- Resources available/needed;
- Instructions on communication
- Update on safety and security

2.7.1 Standard of Care

During normal day-to-day operations, patients are treated according to standard protocols, which leads to neglect in standard operating procedures, i.e. too many patients to few medical practitioners to respond to the needs or vice-versa. However during an MCI or disaster this is inefficient use of manpower and resources and can be catastrophic. The primary principle in triage and treatment of victims

of an MCI is to do "the greatest good for the greatest number of patients with the least depletion of available resources".

2.7.2 Debriefing

Whether an MCI response was real or a practice, it is imperative that all involved review and analyze the incident. This is to establish what worked and what did not work and what could be done better. The goal of the critique is to learn, not to place blame. The lessons learnt at each response, forms a basis for drawing recommendations for the next operation and could be published as a reference guide and enrich institutional memory. The debriefing should cover points outlined in the mission statement, operation briefings and other guidelines provided. Elements to be highlighted in the debriefing should include:

1. Review of mission statement/Terms of Reference: Were they adequate, were they amended, if so, for what reasons? For example, complexities may arise during an operation that may require the response team to deviate from their original mandate, such as in the case of multiple road traffic accidents that may involve pedestrians. As such, the mandate may need to be reviewed to ensure that all elements are catered for in the rescue operation;
2. Mobilization of response team and their preparation for the rescue;
3. Logistics: Was any additional equipment sourced? Were transport modalities adequate: etc
4. Support from NCC and other partners;
5. Organization of Work and assessment processes - should be evaluated in line with experience.

An information meeting should be convened with all parties involved and interested parties, where a summary of activities is provided, highlighting both limitations and achievements, with use of visual aids if possible.

The team leader with contributions of all other team members should compile a mission report. The report should draw out recommendations, which are simple, and follow up support should ensure sustainability.

Finally there must be an opportunity for the rescue workers to individually deal with the trauma of their experiences after an MCI. This may be caused by the sheer tragedy, suffering and extensive injuries and the unfairness of the situation that may be replayed in their minds long after the disaster is over. This is called Critical Incident Stress Management (CISM). It is a structured group meeting that allows the rescuers to discuss their experiences, feelings and their reactions after the incident. When the need arises, procuring specialized services of a counselor/psychotherapist may further allow the rescue workers deal with the trauma.

2.8 Considerations for Triage

Triage is an aspect of resource management that involves the distribution of resources for medical care. Traditionally, triage has been called the keystone to mass casualty management (Bowers, 1960:59). Triage comes from the French verb *'trier'* which means to sort. It is said to evolve from the Napoleonic times as a technique for assuring priorities for treatment the injured when resources are limited. The basic concept is to do the greatest good for the greater number of casualties. Generally, attention is given first to those with the most urgent conditions (i.e. life-threatened

persons) and to those who are have a greater chance to survive. This technique is essential for good disaster medical care.

In his book Disaster Response, Heide adds that doing the greatest good to the greatest number of disaster casualties does not however involve more than just deciding who gets treated first. It also requires that the use of all the available treatment resources is maximized. That is, that the casualties are distributed rationally among the various hospitals and other treatment facilities.

Consequently, the definition of triage refers to the organized evaluation of disaster casualties to establish treatment and transport priorities. Typically, management of triage is a systems problem requiring inter-agency coordination.

There are three major reasons why triage is beneficial in disaster response:

1. Triage separates out those who need rapid medical care to save life and limb.
2. By separating out the minor injuries, triage reduces the urgent burden on medical facilities and organizations. On average, only 10-15% of disaster casualties are serious enough to require over-night hospitalization.
3. By providing for the equitable and rational distribution of casualties among the available hospitals, triage reduces the burden on each to a manageable level, often even to non-disaster levels.

As in any operation, several defects have been identified in the aPplication of triage, as has been observed in various disaster response °Perations. The most comprehensive data collected are those from the

disaster Research Center in Delaware U.S.A obtained as part of a study of emergency medical services in 29 major U.S disasters. According to Quarantelli, (1983:69), Tierney, (1977:154), these studies reveal an interesting discrepancy:

In 55% of the cases studied, responders claim to have carried out triage. However, the researchers found that emergency personnel used the word triage in a loose fashion to describe almost any handling of the victims. Sometimes the presence of uniformed medical personnel seemed to suggest to onlookers or other responders that triage was being carried out even when it was not.

This observation would most likely be seen in the Kenyan disaster scene. In majority of disasters, casualties are distributed at random and are not distributed among the available hospitals in a rational or efficient manner. Instead, the vast bulk of them end up at the closest hospitals while other hospitals receive no casualties at all. A variant of the patterns is where one hospital in the community is thought to give superior emergency care to critical casualties or is renowned as the local trauma center resulting in the majority of the casualties ending up there.

In 75% of the cases studied, a majority of the casualties were sent to the closest hospitals. In 46% of the cases, more than 75% of the casualties were sent to the nearest hospitals. Only in about 50% of the disasters did a simple majority of the hospitals in the area receive even one casualty.

The study also revealed that not only did one hospital receive the largest number of casualties but also those most seriously injured. In one disaster, for example, 40 out of 51 casualties were sent to one hospital which admitted 30 of them (28 in serious condition) .The remaining 11

victims were taken to four other area hospitals. Not one of these 11 victims had injuries considered serious enough to require hospitalization.

It should be noted that this does not mean that an optimal pattern for the distribution of victims should be that every hospital receives an equal number of patients. A facilities ability to take care of specialized cases (e.g. trauma) may affect the number of cases it can effectively handle. Reasonable balanced distribution of disaster casualties and the use of all hospitals to their level of capabilities seem to be a reasonable measure of optimal resource use. Adequate triage and casualty distribution is easier to achieve in the case of a multiple casualty traffic accident than for disasters such as earthquakes and floods, that cause injury and destruction over a wide area.

2.8.1 Cause of Triage Problems

According to Heide and various studies of disasters, "one of the difficulties that faces emergency medical services systems trying to carry out triage is that many injured casualties reach hospitals outside the EMS system with less than half arriving in properly equipped ambulances. Researchers have noted a strong tendency for public officers to load victims into whatever vehicles were handy and send them off to hospitals. Some disaster plans call for the delay in evacuation of victims from the scene. This is so they can be triaged for orderly and rational field stabilization and transport. Other plans call for the use of the field first aid stations to alleviate the burden on hospitals. However this plan does not always take into consideration the perspective and motivations of the public or the victims, which are often times different from those of the planners. Failure to take this consideration results in plans which look good on paper but which are unrealistic and Unachievable.

Drabek asserts that often the public perception of good emergency care is transportation to the hospitals as quickly as possible. If medical care and transportation are not furnished promptly by official emergency organizations, victims do not sit idly and await its arrival. Instead they get themselves to the hospitals by the most expedient means available. Often they will go to the nearest hospital, the one they are most familiar with, or the one in which they have the most trust. For many people, first aid is seen as an inferior level of medical care. (Drabek 1986:139,170)

2.9 Optimal Structure and Operations of a Disaster Management Team

Disaster management is a complex field of study and involves many different players coming together to form one 'force' to combat a particular disaster scenario. It is therefore quite difficult to address an optimal structure, as this will depend on the various situations that arise that can be classified as disasters. However, an attempt will be made to look at some of the attributes that should be found in most disaster management organizations. As earlier stated, the disaster management team will be able to deal with a variety of situations such as firefighting, disaster prevention, combating maritime pollution, flooding, earthquakes, fighting infectious diseases among others. As is clear from the diversity of the situations that such a team would face, so too is the diversity of the team that would be involved. A fire situation will require fire fighters, medics, policemen, the media and volunteers from all walks of life would/should be able to work in harmony at all times so as to ensure expeditious and effective an operation as possible.

Natural disasters can wreck communities and natural resources yet effective action by emergency services can do much to mitigate catastrophic effects of such disasters. In contrast, man-made disasters

are often the result of carelessness or human error and can be avoided or better controlled by recognizing the potential for danger and taking preventative action. It therefore becomes important to see the requirement of an organization that can plan for the unknown so they can respond positively to crisis situations and handle events with confidence and authority both during the crisis and its aftermath (FEMA). Such an organization will consist of various arms of government agencies coupled with other civic and private organizations that can be called upon during such moments of crisis.

The optimal structure and operations of such an organization should have, as their ultimate aim, making communities disaster resistant, better protected and better prepared.

2.9.1 Status of a Disaster Management Office

The optimal disaster management office or organization should have the legitimate authority to carry out its duties and to oversee the entire operations to its conclusion. The organization should have 'teeth' provided to it by law to give it the mandate it needs to be effective. "In order to gain the attention, respect, and cooperation of other governmental offices, disaster planning must be given a place in the governmental hierarchy that provides the necessary status, authority and support" (Stevenson, 1981:42). Unfortunately disaster planning is often relegated to a position of low status in the administrative hierarchy of organizations. It is normally, "isolated from any existing sources of political power and from the priority-setting, budgeting and decision making processes (Drabek, 1986:53, Tierny, 1985:74)

In a situation like Kenya, the National Operations Centre, NOC, lacks the status expected for an organization that it is supposed to represent. This leads it into becoming 'toothless' in terms of its overall effect in the

society- Its establishment by an act of parliament will go a long way in legitimizing its authority to oversee and conduct disaster management operations.

2.9.2 Principle for establishing a Disaster Management Office

Disaster planning is an illusion unless: it is based on valid assumptions about human behavior, incorporates an inter-organizational perspective, is tied to resources and is known and accepted by the participants (Heide 2000, online). In view of the above, it is clear that a thorough amount of brainstorming and networking is required to realize a fully effective disaster management organization. A great deal of time and resources, both human and material is required to establish such an outfit.

Preparation and readiness are the only effective ways of guaranteeing success to the disaster management team. When disaster strikes, the best protection is knowing what to do. This involves many different groups and organizations moving quickly in response to an emergency with minimal effort and use of resources. Inevitably, a great deal of training and drilling during 'peace time' will be involved in order to attain the level of preparedness expected of such a team. The team should train to improve its ability to respond and recover from all types of emergency and disaster situations.

2.9.3 Optimal Structure of Disaster Management Team

The optimal structure though not exhaustive, should incorporate all the likely players in the roles that they would be most effective in ultimately, all players should have a representative at the highest level of the structure so as to participate effectively in the local emergency operations. A good example of a structure that works is the US congressionally funded project called FIRESCOPE (Fire-fighting Resources of Southern California Organized for Potential Emergencies),

which was made up of federal, state, and local fire fighting agencies in Southern California. FIRESCOPE was chartered in 1972 after a series of devastating wildland fires. It was tasked with the development of coordination processes for multi-agency fire operations. The most important feature of the FIRESCOPE process is planning by the users (responders). The planning process describes a four-tiered decision-making and planning body (Heide II).

The FIRESCOPE Structure For Emergency and Disaster Planning

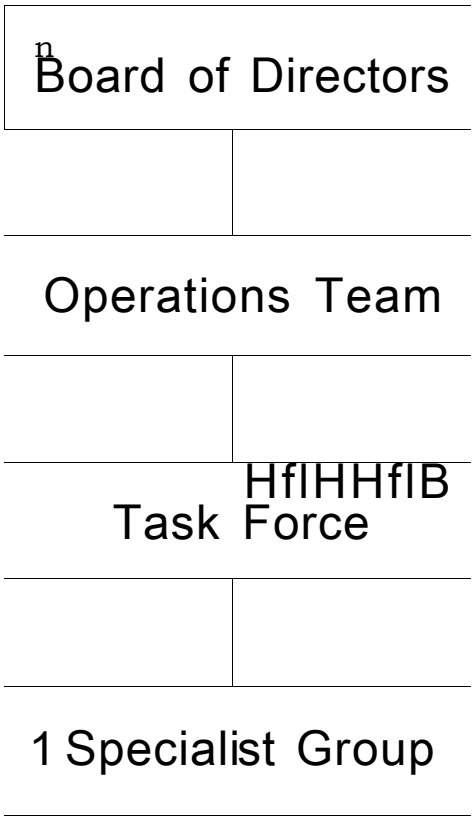


Fig. 3.1 Source: ASIS:20

- The Board of Directors is made up of agency directors and sets goals and policy.
- The Operations Team is composed of the agency operation chiefs (deputy, assistant, or division chiefs, those who are directly in charge of each agency's emergency operations). They implement board decisions and recommend new proposals for consideration or review.
- The Task Force is composed of supervisory operations - level officers (for example, fire battalion chiefs, police sergeants). They provide most of the general staffs work and basic analysis.
- Specialist Groups are composed of agency specialists (for example, experts in training, communications, public information). They perform technical staff work in their specialized areas of expertise

In this model the administrative management of the planning and implementation is through a coordinator who should be as free as possible from the influence of any single agency or jurisdiction.

The Federal Emergency Management Agency defines disaster as:

> "...An occurrence of a severity and magnitude that normally results in deaths, injuries, and property damage that cannot be managed through the routine procedures of government. It usually develops suddenly and unexpectedly and requires immediate, coordinated, and effective response by multiple government and private sector organizations to meet human needs and speed recovery." (Heide Ch4: 3)

Good disaster management in the optimal structure of a team is not Merely an extension of good day-to-day emergency procedures. It is more than just the mobilization of additional personnel, facilities, and

supplies. Disasters often pose unique problems rarely faced in daily emergencies. A well thought out and rehearsed team is therefore operative if the response is to be timely and well coordinated. The players or responders must know each other and must also accept and understand the overall plan, which they play a part in creating. While agencies and organizations are able to communicate at this level, the next level of communication, which is even more crucial, is the operational level.

2.9.4 Communication

An optimal structure of the disaster management team must have excellent communication capabilities during preparation and more importantly during the disaster response. One of the most consistent observations about disasters is that communication is inadequate. This often leads to confusion and misunderstanding between responders that in turn leads to unnecessary loss of lives and resources and also time to effectively manage the disaster. At the initial stage, communication channels need to be outlined with guiding principles to assist users. The main center, with a focal point, should be identified as the main communication hub with the mandate of ensuring communication is consistent with other bases. According to Heide, "Interorganisational communications is fostered by those factors which promote trust in other organizations and familiarity with how they function. These include informal contacts, joint planning and training, pre-planned agreements for the division of disaster responsibilities and the use of similar terminologies, procedure and performance criteria." (Heide, 2000, online)

The concept is based on the fact that those who work well together on a daily basis tend to work well together in a crisis. Communication based °n general interaction with one another and also communication based °n the use of equipment, frequencies that are understood by all is a

prerequisite of any successful operation. Therefore interorganisational radio networks, common mapping systems and computer networks also contribute to effective communication.

Good communication at all times also leads other organizations to the knowledge about each others access to unusual resources valuable for disaster operations e.g., satellite technology, search dogs, devices for chemical analysis, etc. As such inter-agency response is beneficial to all as the resource base is wider and hence more cost effective. Heide stipulates that disasters create the need for coordination among fire departments, law enforcement agencies, hospitals, ambulances, military units, utility crews, and other organizations. This usually requires inter-agency communication networks utilizing compatible radio frequencies. Often, the zeal to outperform each other leads disaster response by agencies operating independently to failure. The most cost effective disaster mitigation involves effective, reliable communication. Such communication is vital for disaster reduction. (Heide, 2000)

2.9.5 Media Relations

Whenever there is a newsworthy situation, the media will always be there. Communications can also be characterized by the way the disaster team should handle the media and the public in general. The media and public often evaluate how effectively a disaster was handled by how open and forthright the emergency team is concerning the specifics about the disaster. It is imperative for the disaster team to have a good public relations team or person to effectively handle the public and media. At the same time, if an individual team member is approached by the media, they should be allowed to speak to them confining the discussion to the specific work they are carrying out. It is important to note here, that the more informed the media are, the better the chances of getting external help (both local and international). The world will be able to get

accurate information about what is going on and thereafter be able to provide the right assistance in terms of materials, equipment and expertise. It would still remain the team leaders' prerogative to decide what extent or detail of information one needs to give out bearing in mind the effect this could have on an operation. The team leader should assume the responsibility of drawing out guidelines for dealing with the press. The team must always remain conscious of the fact that there may be discrepancies between media presentation of a disaster and the reality. A recommendation to curb this is the issuing of written press statements updating the public of the effort in place. Periodic press briefings can be handled by the team leader or media relations officer. In whichever case, the presenter must have good communication skills to portray the reality on the ground.

According to Heide, 'many emergency managers have been frustrated when they have had to divert much needed time and resources to address the demands of the media, while at the same time trying to mount a multi- organizational disaster response under conditions of extreme urgency and uncertainty. Well-planned interractions with the media, though, can be of critical importance in decreasing the loss of life and property. In those types of disasters where warning is possible, accurate, timely, and consistent information conveyed to the media can be one of the greatest factors preventing death and injury' (online, chapter 10 : 1 of 31). Disasters are a media event and ultimately, the media do get themselves involved completely. Therefore, rather than have them interfering negatively, it is important to have them on board with a clearer, more effective and complementary role. It has been suggested that difficulties with the press occur because emergency agencies and organizations do not understand how the media operate in disasters and how to deal with them in an effective way.

2.9.6 Emergency Organization Structure:

A typical example of an Emergency Management team structure:

Emergency Management Team Structure

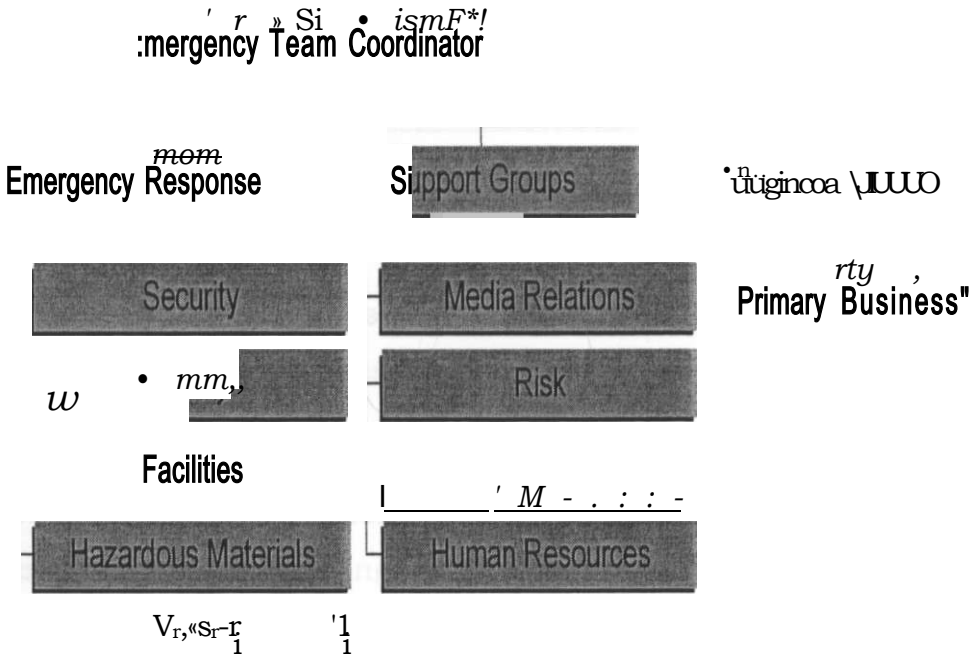


Fig. 3.2 Source: ASIS: 29

This example is one of many possible approaches to emergency management organizational structures, which will vary with the type of organization, type of business and other factors (ASIS: 24). The optimal structure and operation of the Disaster Management Team for the example above will be ideal for most disasters, from the lesser scale to the bigger ones. Each group will be assigned responsibilities and duties in the plan and this should be understood and agreed to by all the participating groups. The emergency management team should comprise

representatives of all the participating groups, preferably, the leaders of the groups. These are the individuals who come up with the 'game plan' for the entire operation. Some tasks are applicable to all organizations, such as, maintaining available cash, protecting and backing up key records, and keeping notification lists current.

2.9.7 Organizational Components

The optimal structure will require certain desirable components for a counter-disaster organization:

- Direction / Control / Coordination Structure - an operational chain or basic network through which authority can be delegated and decisions implemented.

- Facilities - for operations rooms, communications centers, equipment stores, personnel facilities etc.

- Communications - the direction, control and coordination structure must have an effective communications network (for instance, a police network) and supporting this with other networks for backup or standby emergency purposes. Existing regular broadcasting systems are, of course, invaluable for disseminating information to the public and for transmitting messages in circumstance where this is necessary.

- Trained Personnel - provision of adequately trained people, especially for key appointments, is necessary to ensure that the organization will function satisfactorily.

* Warning Alert System - arrangements are required for warning and alerting the counter-disaster organization so that it can be activated as required for operation. This activation requirement is a specific one. However, it can usually be integrated into the overall system for

warning of a disaster event (for example, warning of the development and movement of a cyclone).

- Information gathering and processing system - to be effective, the counter-disaster organization must include an adequate system for collection, collation, assessment, and distribution of information.

- Mobility - a mobile capability is desirable for most counter-disaster organizations, mainly to offset disruption caused by disaster events themselves. It is also with giving careful consideration to this aspect where difficulty of access or remote island conditions applies.

- Liaison - to ensure effective coordination between the various organizations and agencies involved in counter disaster measure, an established system of liaison is necessary (Carter, 1984: 150-151).

This summary by Carter does well to show all the major areas of consideration when designing an outfit to handle disaster situation. While it is not possible to cover all the possible scenarios that often arise in the fluid and volatile environment that makes up the disaster scene, the areas mentioned if well planned and thought out will provide a good foundation for an effective team. It is important to note as a conclusion that the chaotic nature of disasters will often disorganize even the best-prepared teams. This is because the very nature of disasters can devastate entire communities of which the disaster managers and team players are a part. Therefore, by the time the teams are able to survive the disasters as individuals and regroup to begin to cope with the effects, valuable time can be lost. Preparation and continuous training and drilling are the best way of adequately addressing most scenarios that will be encountered at the scene of the disaster.

2.10 Theoretical Framework

Theory is the main pivot of all sociological research. The social contract that a government has with the citizenry compels it to perform certain duties and to provide certain services to the citizens.

2.10.1 Human Services Intervention

According to Eriksen, (1977:13), Human Services is a term that reflects the need for society to help its members live adequate and rewarding lives. Human service activities is the act of people helping other people meet their needs in an organized social context. Human services have emerged in response to the increase of human problems in our modern world (Harris 1996:10). Harris further defines Human Services intervention as "a broad field of human endeavor in which the professional acts as an agent to assist individuals, families and communities to better cope with crisis, change and stress".(p 11). The degree to which there exists public support for human services programs is determined by the state of the economy.

2.10.2 Systems Theory

This theory, propounded by Talcott Parsons (1973), recognizes the main functions of a system, namely, maintenance, adaptation, goal attainment and integration. This theory can be applied in any social system ranging from the family to the state. The NCC ambulance service falls in this category.

This theory assumes structural functionality and concentrates on the structures or societies and their relationship with each other. It assumes that structures are mutually supportive and lean toward a dynamic equilibrium. Emphasis is placed on maintaining order amongst the various elements of the society. Parson's basic view on inter-systematic relation was essentially the same as his view of intra-system relations,

that is, that they were defined by cohesion, consensus and order. In other words, the various social structures performed a variety of functions for each other (Ritzer,1987: 202).

The four functional imperatives for all action systems, is the Talcott Parsons' famous AGIL scheme. A function is 'a complex of activities directed towards meeting a need or needs of the system'. Parsons believes that there are four functional imperatives that are necessary and characteristic of all systems:

A - Adaptation

G - Goal Attainment

I - Integration

L - Latency

In order to survive, a system must perform these four functions. If conflict becomes sufficiently disruptive, it must be controlled. It requires a language in order to survive.

Actors in an organized system, while pursuing their own interests, the actors are in fact serving the interests of the system as a whole. (Parsons 1951, Pg. 242)

2.10.3 Radical Interpretation of disaster

In an article by Dr Ben Wisner (2001), he queries, "What does political theory tell us about a state that is incapable or unwilling to apply a body of established knowledge, at low cost, that would protect its citizens from disasters? Is that good governance? Is that a legitimate state?"

The most challenging question focuses on whether human beings have a right to security from disasters triggered either by extreme events in nature or by failure of human techno- systems. He further asks, " Does an acculturated species that shapes its own 'second nature' move

towards a shared belief that the authorities responsible for social order have a responsibility to provide minimum, internationally agreed safeguards against catastrophic events?"

On this basis, it is a fundamental human right to preserve life, hence the responsibility of those mandated with the task to fulfill their obligation in this respect.

2.11 RTA's in the United States

Motor vehicle accidents are the leading cause of injury and death in the United States. Americans collectively drive almost 3 trillion miles per year and 3 million people were injured or killed in 2002. The national Highway Transportation Safety Administration (NHTSA) compiles statistics regarding motor vehicle accidents and some of the results are alarming, in 2001.

1. 3,000,000 people were injured in motor vehicle accidents.
2. 413,000 died in motor vehicle accidents.
3. 40% of the fatalities were alcohol related.
4. 2,600 children under the age of 15 were killed in motor vehicle accidents
5. 7,500 young drivers (16-20) were involved in fatal crashes.
6. 3000 motor cyclists were killed
7. 4,700 pedestrians were killed
8. Improper use of seat belts accounted for 63% of the fatalities.

In the same light, in Kenya, death by motor vehicle accidents is one of the highest causes of death after malaria, a disease common in tropical Africa and one which International bodies are spending millions in resolving. This in effect reflects the relevance of this study, in addressing what has for a long time not received much focus in the national agenda,

and yet is by far crucial in preservation of human life if appropriate measures are put in place.

CHAPTER 3

METHODOLOGY

This research was carried out as an exploratory study that addressed the institutional capacity of the Nairobi City Council Ambulance Service in providing emergency services to the residents of Nairobi. According to Saunders et al (1997:78), 'exploratory studies are a valuable means of finding out what is happening; to understand insights; to ask questions and to assess phenomena in a new light. They are particularly useful if you wish to clarify your understanding of a problem'. Emory and Cooper (1991) further add that time is well spent on exploratory research as it may show that the research is not worth pursuing. Exploratory research is conducted by:

- A search of the literature;
- Talking to experts in the subject;
- Conducting focus group interviews.

It is flexible and adaptable to change. The focus is initially broad and becomes progressively narrow as the researcher progresses (pg. 79). Exploratory research is a natural step specifically in this research exercise.

Further the study sought to gather both qualitative and quantitative data. The reason for these being that the people's perception especially those of the medical personnel tend to influence the outcome of any activity in which they take part. Qualitative research emphasizes oral communications and gives the respondents a chance to state their problems the way they perceive them and participate in seeking solutions to these problems as well as in affecting such solutions. It is also referred to as participatory observation. According to Filstead (1970:6) 'the term

qualitative methodology refers to those research strategies such as: participant observation, in-depth interviewing, total participation in the activities being investigated, field work, which allow the researcher to obtain first hand knowledge about the empirical social world equation'. In support of qualitative research, he observes that by doing qualitative research one is able to get close to the data, thereby enhancing your understanding of the problem equation.

Qualitative research can use one factor to explain one event and uses descriptions and narratives as opposed to variables to explain the findings. Statistics are not used to analyze the data collected. With qualitative research, one is able to get an insiders view of the reality being investigated. One is able to go beneath the surface and understand why events take place. Qualitative research deals with a minimal size of sampling and this greatly reduces the cost of the researcher. Qualitative research uses a non-mathematical process of interpretation carried out for the purpose of discovering concepts and relationships in raw data and then organizing this into a theoretical explanatory scheme (Strauss - 1996).

Qualitative survey was also applied so as to document the facilities and resources that are available to the City Council and that can be used to respond medically during the occurrence of disasters in Nairobi and its environs.

3.1 Site Description

The study was conducted at City Hall and the Fire Station in Nairobi. City Hall is the headquarters of the Nairobi Civic authority and houses amongst others the Mayor of Nairobi. City Hall is responsible for the delivery of services to the residents of Nairobi and is therefore answerable to them should there be any dissatisfaction with the services rendered. The Mayor heads the budgetary committees that determine the allocation of funds to the various functions that the council is supposed to provide to the residents of Nairobi.

The city department of health services is also housed at City Hall and directly oversees the functioning of the NCC ambulance services. The study was concentrated here to get to understand the mandate that this department has been issued.

Finally, the study used the Fire Station in Nairobi, which also houses the City Ambulance services as a base for this study. It involved a review of the facilities and discussions with personnel based at the institution. NCC Ambulance Service was selected because it is the only organization that provides pre-hospital care for the residents of Nairobi on a day to day basis. Secondly, being a public funded institution it has the moral obligation of responding medically to the public whenever there is an occurrence of emergencies.

3.2 Sampling Design

Purposive sampling was utilized in this project. This is a technique that allows the researcher to only use those cases that have the required information in respect to the objectives of the study. The researcher interviewed at least 20 respondents chosen from the City Hall health department hierarchy. The case selection was not random and non-probability sampling was used. According to Singleton (Ibid: 152), in

many instances, this form of sampling is either more appropriate or practical than probability sampling or the only viable means of case selection. Consequently, in-depth interviews with key informants were used.

The researcher relied on his expert judgment to select units that were representative or typical of the population, in this case, Ambulance services and the personnel that work there.

Purposive Sampling

In this form of sampling, the researcher relies on his or her 'expert' judgment to select units that are representative or typical of the population. The description is that the researcher is well informed about the units to be selected. In this case, the study focused on ambulance services in Nairobi and the NCC was purposively selected being one of the few such service providers. This type of sampling demands considerable knowledge of the population before the sample is drawn.

According to Saunders et al (1997: 145-146), purposive or judgmental sampling enables you to use your judgment to select cases, which will best enable you to answer your research questions and meet your objectives. This form of sample is often used when working with very small samples, such as in case study research and when one wishes to select cases that are particularly informative.

Non-Probability Sampling

In the case of non-probability sampling, the chances of selecting any case are not known because cases are non-randomly selected when the sampling frame is not available. The researcher can influence the research process. It is not possible to calculate sampling error. According to Singleton (Ibid: ,152), " in many instances, this form of

sampling is either more appropriate and practical than probability sampling or the only viable means of case selection". This method is appropriate:

- When a researcher has very limited resources i.e. time, fund, personnel etc;
- Where there is no sampling frame and only very few cases can be included in the sample;
- In an intensive study where too many details of a case are needed, for example in the case of exploratory study

3.3 Sources of Data

The study used both primary and secondary data sources.
The researcher obtained data that captured the experience of the respondents regarding the topic of the study. These sources were important and relevant as they yielded information that was used to help understand how the ambulance service functions on a day-to-day basis.

Primary data was collected through use of interviews bearing questions that were relevant to the study objective. Interview schedules for in-depth interviews with personnel drawn from the various relevant sections and key informants were useful in this respect.

Library research to review written materials related to the topic under study was carried out as a reference point and to help build the report.

3.4 Methods of Data Collection

Data collection methods included the following:

I. Unstructured interviews;

These are unstructured interviews involving spontaneous questions that come in the course of the events. This provided the researcher a better understanding of the formal and informal organizational structure of the organization under study and showed more clearly whether they play the role that they are mandated. As an exploratory study, a lot of new information was gathered that facilitated the final analysis of the report. Those who were interviewed in this way included, the rescue workers on shift, the officer in charge and the head of public health services.

This method of data collection was particularly useful in ensuring confidentiality to certain respondents who were uneasy about their comments being reflected to their superiors and feared being compromised. These unstructured interviews shed light on certain elements that are not documented, especially the informal structure that the NCC operates. It provided an avenue for obtaining information for lower ranking officials at the council.

II. Key informant interviews

These are interviews with different groups or individuals who were knowledgeable about the topic under study and were considered somewhat experts in the field of disaster management and mitigation. Their opinions on the topics guided in shaping the kind of conclusions and recommendations that were made. These included the paramedics, head of the fire station, operations room head supervisor, the police force and other persons with relevant information including some officials from various international bodies. .

III. Focus Group Discussions

These are discussions that were conducted with different people from different departments or interest groups. Their perception of different activities proved to be helpful in the final analysis. These discussions mainly focused on groups involved in a response at one time or other or have operational responsibility as a group in responding to an emergency. The focus discussions were held with various traffic police personnel, various teams at both the fire station and Nairobi City Council, some personnel at casualty departments at national hospitals, response teams in the Kenya Red Cross and AMREF. The aim of using this method of data collection was to review how teams respond to emergency calls and what levels of preparedness they have before embarking on their mission. The discussions with AMREF provided a guideline on what expectations one might expect in such a response.

3.5 Data Analysis

Various methods and techniques were applied to analyze data collected depending on their nature. Descriptive statistical procedures were used to describe the distribution and derive patterns from the data. Where possible, qualitative tools and methods were applied on the data collected from Focus Group Discussions (FGDs) and in-depth interviews.

Qualitative data collected was analysed on a continuous basis as data was collected. Data collected in this study consisted of three flows on concurrent activities, data reduction, display and conclusion drawing or verification (Miles and Huberman 1994)

In data reduction, the process involved selecting, simplifying and transforming the data that was presented in the form of written field notes or transcriptions. This exercise was continuous. The aim of data

reduction was to sharpen, sort, focus, discard and organize the huge amount of data from the field with the aim of obtaining preliminary conclusions. Data has been displayed in simple forms such as charts, graphs and matrices for easy comprehension.

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF DATA

4.1 Introduction

This chapter will elaborate on the findings of the research based on the specific objectives and using the data collected during the research. Data collection bore in mind the specific objectives for the research i.e. life-threatening road accidents in Nairobi, institutional capacity and role of NCC Ambulance Services in responding to the traffic accidents in Nairobi.

4.1.1 A brief history of The City of Nairobi

The City of Nairobi was established in 1895 and designated the capital of the British colonial government ten years later. It is Kenya's largest city. It is the country's political and administrative capital and the primary center of commerce, finance, industry, education and communication. The city sits between 5000 and 6000 feet above sea level and is characterized by good weather all year round. Administratively, Nairobi is both a district and a province. It is divided into eight divisions, which are in turn made up of 29 locations and 63 sub-locations. The Nairobi City Council (NCC) is responsible for the overall administration of the city. Nairobi has a population estimated at 2.5 million today and the population continues to grow rapidly as more and more people move to the city in search of employment. The city has also grown structurally with new buildings constructed. However, the development of the infrastructure has been haphazard and the poor planning has hampered the efficiency of the city's planning for traffic and other services that should be available to the citizens. Population densities of Nairobi vary greatly within the city. Some predominantly high-income locations have

average densities as low as 300 to 2100 people per square kilometer, while low-income locations have densities as high as 33,000-43000 (Lamba, pg4).

Informal settlements are growing faster than the rest of the city, primarily because they are home to new migrants from rural areas. Severe economic hardships during the last decade have forced increasing numbers of people to live in informal settlements who might otherwise have been able to afford better housing. Nairobi has over 170 public and private health care facilities, ranging from single purpose clinics to full service hospitals. NCC manages a full range of health services although some areas are grossly underserved. Most of these services are provided to the slums, which happen to have the most inhabitants. NCC facilities are typically overcrowded and understaffed. They experience chronic shortages of medical supplies, drugs and equipment. These constraints adversely affect the quality of care provided to the citizens. It is with this background that the NCC Ambulance Service will be investigated.

4.2 Road Traffic Accidents

Road traffic accidents are a daily occurrence in the city of Nairobi and can only be differentiated by their severity. According to the Kenya Police Traffic Department, Annual Report, 2001, more accidents occur during the day due to the fact that there is congestion of both human and vehicular traffic. The main contributors of accidents are, careless driving, careless pedestrians who fail to use flyovers and bridges where provided and pedestrians who do not take heed of zebra crossings, signs etc. the poor conditions of roads and other infrastructure have also contributed greatly to accidents

The table below illustrates the Kenya police traffic accidents statistics for the year 1999, 2000 and 2001.

National Annual Statistics

	1999	**2000**	**2001**
Fatal	2292	2184	2081
Serious	4329	4227	4462
Slight	7670	7527	6864
Total	**14291**	**13938**	**13407**

Table 4.1: Source: Kenya Police Traffic Department

Nairobi Annual Statistics: fatal accidents

	1999	**2000**	**2001**
a) Fatal accidents			
No of accidents	465	505	469
No of fatalities	489	531	520
b) Injury accidents			
No of injuries	5194	5010	4490

Table 4.2 Source: Kenya Police Traffic Department (various)

From Fig 4.1, a pie chart reflecting the figures represented in the Table 4.1 and 4.2 above, it is clear that Nairobi has the highest number of RTAs in the country and accounts for about 25% of the fatal accidents in

the country. It also accounts for the highest number of injuries at over 40% as is more visible

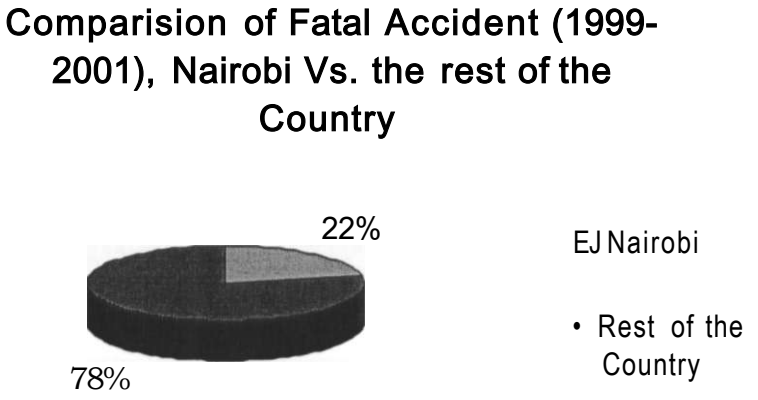


Fig 4.1: Kenya Police Traffic Department (various)

4.3 NCC Ambulance Services Response

The table below illustrates the nature of the response that the service was involved in 2001 and 2002.

	2001	**2002**
Medical emergencies	96	106
Fire	56	63
Accidents	120	131
Pumwani maternity	12	15
Municipal clinics	8	11
Total	**292**	**326**

Table 4.3 Source: NCC Ambulance Service Occurrence Book, 2001/02

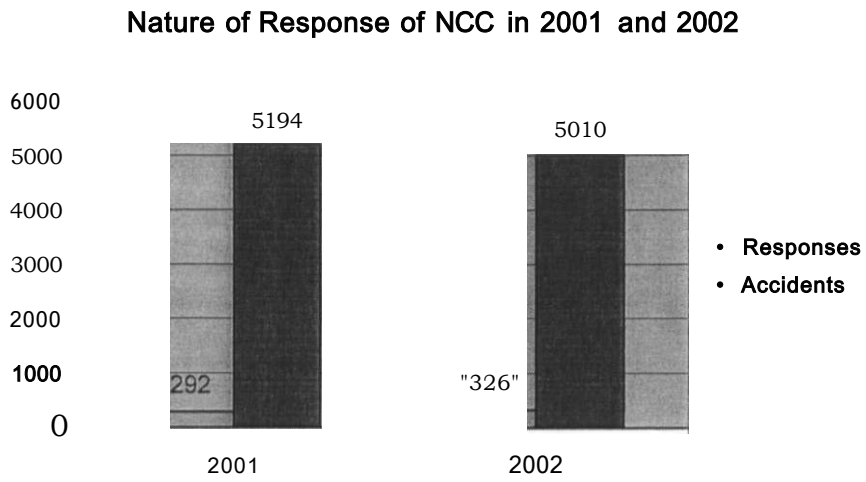


Fig 4.2: Source NCC Ambulance Services Occurrence Book 2001/02

It is clear from table 4.3 that the Ambulances respond to less than one case of any nature per day in any given year.

From Table 4.3 and Fig 4.2 above, it is clear that the NCC ambulances were only able to respond to a fraction of the accidents that occurred in Nairobi. This is their core business and there is a glaring gap as to their capability to perform their required tasks as stipulated in their mandate. In 2000, out of 5194 injured persons, the NCC was only able to respond to 120 of them. In 2001, out of 5010 injured persons, the service only managed to respond to 131. When one imagines the number of other emergencies that occur in the city on any given day, it becomes obvious that the institutional capacity of the NCC is lacking or insufficient. The role played by the NCC can therefore be termed as negligible in this respect. It was also established that due to the lack of coordination and communication, triage is practiced in a haphazard manner, leading to further loss of life at the scene of the accidents.

4.4 Institutional Capacity of NCC

The Nairobi City Council ambulance services are situated at the Fire station on Tom Mboya Street opposite the Old Nation station in the heart of the City of Nairobi. It is co-located with the Nairobi Fire Brigade where they share a complimentary role. The building they are housed in was erected in 1905. The building still stands today as it did at the time and very little has been done to expand or modify it.

The primary role of the ambulance services is to provide quick, and efficient response to any emergency in Nairobi and its environs. The kind of the responses that they have typically responded to in the past include fires, road traffic accidents, drowning, emergency medical cases, bomb scares etc. Unlike in the typical emergency setup, the ambulance services are autonomous and are independent of the fire services both administratively and operationally. The ambulance service falls under the Medical Officer for Health (MoH) who is a Chief officer of the health department in City Hall while the fire service comes under the City Engineering department. They are therefore small sections in the two departments and are run directly by relatively junior officers in the NCC hierarchy.

The ambulance services runs four ambulances, each with the capability of carrying one lying patient each. These are manned 24hrs a day and are expected to respond to various distress calls that they receive. They are operated by 47 personnel who work on a shift basis both during the day and night. According to the Senior Ambulance Supervisor who heads the section, the shifts are divided into day and night with the day shift comprising of 8 hours and the night shift comprising of 16 hours. The ambulances are fitted with emergency first aid equipment, which includes, stretcher, bandages, beddings oxygen, blood pressure

machines, thermometer, spirits and disinfectants. The International Medical Corps donated two of the ambulances in 1999 after the bomb blast. The two are the best equipped of the entire fleet. There is no communication equipment in the ambulances.

The ambulances provide free services for emergency response such as RTA's but charge a fee for routine medical calls. The charges are varied depending on the distance that the ambulances have to cover, ranging from Kshs 300 for the central business district to Kshs 1200 for the outskirts of the city. However, there is no direct line that connects the ambulance service to the police network and callers have to use a direct line no. 222181/2/3 to communicate with the station. The supervisor adds that this telephone number is not well known to the public and acknowledges that few members of the public are therefore able to reach them.

The ambulance services try to work in tandem with other ambulance services in Nairobi, which include St. John Ambulances and the Kenyatta Hospital Ambulances but allude to the fact that they do not have a communication network between them. The service mainly responds to calls by private hospitals for transfer of patients to public hospitals at a fee. Indeed this seems to be their core business today. This is because they are found to be cheaper and therefore cost effective for the private hospitals.

Morale of the crew is understandably low with all the mismanagement that has been taking place at City Hall. According to a crewmember, their salaries are paid as late as 3 months in arrears. The average salary of a crewmember is Kshs 8000 per month. The low wage does not add to the prestige of the job and the best are not therefore attracted to the job. The motivation to excel was also lacking and the days when the fire

department was the envy of all are long gone. A universal requirement of all fire and EMS staff is that they should be smart and disciplined at all times. As a matter of fact, the station should be run similar to a military operation. The NCC station reminds one of a 'rag tag' army that has lacked leadership and direction in a long time. The state of the uniforms is pathetic and one crewmember intimated that there is no reissue of uniforms after recruitment. It is amazing the majority still maintain a uniform at all.

The offices that they operate from leave a lot to be desired. The supervisor is crumbled in a small room that that he shares with some training aides and mattresses. As said earlier, the building was donated in 1907 for 9 rupees and has seen no expansion since then. The dormitory where the crewmembers sleep is also not adequate and only recently got new mattresses. The operations room is also old fashioned and in urgent need of a facelift. All the personnel operate from offices that were designed and furnished a century ago and can therefore not feel too motivated in their jobs. This state of neglect is hard to fathom and the personnel feel totally neglected and uncared for.

The Training Officer in Charge feels that a budget of less than Kshs 100 million is enough to turn the entire operation around and give it the status befitting the noble profession that they are.

4.5 Organisation

The organization of the NCC also goes to show the level it places the EMS services. (Ref: Annex II (Pg. 75: Fig 4.3: Organizational Chart of the Nairobi City Council (NCC) Source: NCC Brochure 2001).

Figure 4.3 clearly illustrates that the ambulance services falls under the Department of Public Health (DPH) as a small section headed by the Senior Ambulance Supervisor. The section is given the same level under the MoH, as is the *Pumwani* Maternity hospital and other health care facilities in the city. Under this arrangement, the ambulance services have the same priority rating, as do the other council clinics that provide primary care in the various divisions. Clearly, the Council does not attach much value to the Emergency Service Section. The same applies to the Fire Brigade who are co-located with the ambulances. It falls under the City Engineer as a small section and does not get the authority and status that it deserves.

4.5.1 Funding

The Medical Officer in charge of Public health determines the budget of the ambulance section, which competes for his resources with all the other sections under his control. In 2002 and 2003, the ambulance services were allocated Kshs 2 million only. This money is supposed to be used to cover all operations maintenance. According to the supervisor, fuel alone accounted for Kshs 720,000 with the rest going to maintenance of the ambulances and incidentals. The funding requested for by the section was Kshs 12million. These types of discrepancies reflect on the lack of performance or efficiency in responding to emergencies in the city. Considering that the NCC collects Kshs 5 billion in revenue every year, the paltry amount given to the emergency medical response is an indication of the, apathy associated with this vital service.

4.6 Training

No funding has been specifically allocated for training, a core component in disaster response. The little training that has gone on recently has been provided by well-wishers, such as the International Medical Corps (IMC), who trained three Emergency Medical Technicians (EMTs) in 1999. There is no development plan and no incentives for the personnel perhaps contributing to the lack of morale and under-performance of the services at large. The supervisor adds that even a small budget of Kshs. 50,000 to train his personnel in midwifery was recently rejected. The section responds to emergency maternity cases in the city and the technicians need to have basic midwifery skills.

Recurrent training has not been available for a long time due to lack of training aids and facilities. Most of the responders have not undergone any type of refresher course, which is a prerequisite for any medical personnel involved in the day-to-day emergency response. Currently, there are only 13 trained EMTs against a requirement of at least 50. Most of the trained staff underwent through their training in the 1970's when the services had access to more funding. This goes to indicate that many of the responders working on the shifts are not competent enough and do not have the necessary skills to perform the tasks that they handle.

Other than the basic life support training that is available to the crews on initial recruitment, there are no facilities to undertake advanced training which is essential for career progression. Basic training aids that have been budgeted for Kshs 200,000 are not available. These aids include, flip charts, TVs, video, overhead projectors etc. There are only 3 EMS instructors for advanced first aid and advanced emergency care for the sick and injured. 2 mannequins donated by well-wishers, are however, available for cardiopulmonary resuscitation training (CPR).

4.7 Access

The location of the ambulance services in the city center is also a cause for concern. Situated in Tom Mboya Street, the ambulances have no room for maneuver. There is a busy *matatu*[1] bus stop that is usually congested most times of the day. The obstructions caused by these *matatus* are obvious to any casual observer. The priority status accorded to the ambulance services therefore come into question. According to the fire chief, there are supposed to be fire and ambulance stations in all the divisions in Nairobi. A report on the status of the plots that have been designated to house the other stations around the city, written in August 2002 indicate as follows:

1. Gigiri -illegally allocated
2. Westlands - Adjacent to NCC dispensary- illegally allocated. Safaricom customer care located there.
3. Riruta (Kawangware) - behind *Nyina wa Mumbi* maternity- partially fenced)
4. Waithaka (behind DO's compound) - not properly demarcated for proper identification. Temporary structure.
5. Karen (Dagoretti road)- adjacent to Karen dispensary. Open, used as a shamba.
6. Mombasa rd. near container depot - not located.
7. Dandora - not located.
8. Kayole site - not located.
9. Baba Dogo Rd - adjacent to Rafiki enterprises Company is fenced with cider posts, barbed wire and chain link.

From the report above, it is clear that there are no immediate plans to spread out these essential services to the residents of Nairobi.

[1] Public means of transport in the form of a rijinibus

As at the time of submitting this project paper, the situation remained the same.

4.8 Communication

Communication is one of the most important requirements for successful emergency response. Without it, there can be no meaningful response that will be effective and efficient. NCC ambulance services do not have adequate communication with the core partners, i.e. the Police, hospitals and the general public. The emergency 99 number that was used before has been unserviceable for many years. That implies that there is no hotline between the police and the fire and ambulance services. The only number available is a direct line that is not well known (222181/2/3). This telephone number is the only way that the police and members of the public can reach and request for assistance from the station. According to the training officer in charge, the ambulances do not have any communication radios in them and are not able to communicate with the base station, other ambulances, the police or the hospitals once they are out in the field. Consequently, a delay in response is a direct result of the lack of communication infrastructure.

The general public is also not aware of the existence of such services. This is clear by the small number of house calls that the ambulances make. The ambulance services are not advertised and no effort has been made to sensitize the general public about their existence. The community is not involved in their activities and there has been no effort by NCC to build the image and confidence of the service. The apathy of the residents to the NCC is therefore easy to understand.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1. Summary

The Nairobi City Council has a mandate from the Government of Kenya to provide pre-hospital care to victims of disasters ranging from road traffic accidents to major disasters such as the Athi River train crash, and most recent in our memories the 1998 bomb blast at the American Embassy.

5.2 Conclusions

Citing the 1998 bomb blast at the American Embassy as an example, it was evident that the NCC did not have the capacity to cope with even the most trivial of cases during the incident. Further, there has been no indication of plans to modify the NCC, whose infrastructure remains as is, since pre-independence. There is also a great need for reviewing the current budgetary situation of the Council and accelerate resource mobilization efforts to seek the much-needed resources for the upgrading of the services. Having noted the above, it is important to highlight the willingness of existing staff to learn and also provide their services despite not being equipped to handle them.

Judging from its position in the hierarchy, it is clear that ambulance services have not been accorded the importance it deserves as an element of disaster response.

With the greatest life-threatening incidents being attributed to road accidents, there is a need to revitalize and build capacity in this area of the Nairobi City Council. This can be attained in the long run, and could be implemented on various stages, if more funding is allocated to the Council.

5.3 Recommendation

5.3.1. Policy

As an initial step, a formal Disaster Response Plan should be drafted and endorsed by the Government. This should consider giving more importance to the Emergency Management Structure in the Nairobi City Council, as opposed to its current hierarchical position.

There should be an attempt made to establish other centers located conveniently close to major roads. As a start, the Government should repossess all premises that had been identified for this purpose and make a commitment to provide the funds to start up these centers. Initial resources should be provided to build basic structures that can provide immediate assistance to victims of disasters and should be equipped with mandatory apparatus that will ensure victims are adequately cared for. Further resource mobilization strategies should be implemented to ensure that these centers are complete and can cope with any sort of disaster. As a first step, commitment should be made to revamp the current base located at the Nairobi Central Business District (NCBD) as a matter of priority.

Alternatively, the Nairobi City Council could propose autonomy of Ambulance/Safety services, and the Government should back these with the necessary financial support required to ensure sustainability. It could also choose to privatize the services to an individual contractor,

who has the knowledge and expertise to render the service. All the same, resource mobilization should be reinforced to ensure that the minimum operating standards are attained.

Having noted the above, a key element would be to provide training to all members of the Disaster Response Team. Training should be a continuous exercise carried out through classroom training and field exercises. A review of terms and conditions of employment for the workers will not only create the lacking morale, but will also appeal to their humanitarian nature in serving the public. Further, post-response counseling should be availed to the response team, if necessary, by outsourcing the services from professionals.

With specific reference to this study, it is mandatory that the road networks in Nairobi be reviewed with an aim of ensuring there are road reserves, where multiple accidents can be avoided if vehicles pull over as opposed to remaining on the road. This will also address the issue where innocent pedestrians are often caught off guard and find themselves victims of road traffic accidents. In collaboration with the Traffic Department of the Police Force, the Disaster Management Structure should ensure that stringent measures are implemented with regard to adherence to traffic regulations. Defaulters should be penalized in an effort to curb the incidents. In the event of accidents, Traffic police should move in as quickly as possible to control the situation whilst ensuring visibility.

It would be prudent for the Disaster Management Structure to foster relationships with other health service providers such as AMREF; AAR etc, to ensure that there is always support when required. This is also true for other counter-parts who play roles in disaster response. These include the police force, hospitals etc. These communication channels

should be regulated and a task force created to periodically review their capacities in coping with disaster response.

On a more technical aspect, communication mediums within the sector need to be reviewed. As has been explained earlier, there are no communication channels between service providers nor is the emergency number familiar with the general public. Dedicated telephone lines feeding into a help center should be established. Use of satellite telephones, road-side telephone booths which would assist the public in raising awareness in the case of emergencies, web-based applications, Global Positioning System (GPS) should be provided.

Regular patrol by the traffic police on major highways and other accident prone areas should be accelerated to curb accidents and provide immediate response in the event of one occurring.

A key element in the success of an effective Disaster Management Structure is raising public awareness and advocacy. Awareness could be covered through use of various media such as radio programmes, television, newspapers, pamphlets, websites, etc. It could further be included in the education curriculum as also by driving schools. The same mediums could be used for advocacy, whilst encouraging the community to participate in these efforts. In addition, press releases, reading material should be provided at a minimal or no cost to the public.

A library/ s could be established with documented case studies and could also be made available on a website. This in essence will assist the team assemble the best practices and incorporate them in the guiding principles of disaster response. Door to door campaigns and street campaigns should also be used to reach a larger population.

5.3.2. Further Research

Whilst this study has addressed the Disaster Responses mechanisms in place or lack thereof, within the Nairobi City Council, there is a clear indication that this is an area that has not been given due consideration in the National Policy of the country. In as much as pre-hospital care is a basic right to every citizen, there are no indications that there is institutional capacity to deal with this.

Consequently, it would be recommended that further research be undertaken to review the national policy in disaster response and mitigation. The natural calamities that occur in the country are well known and should serve as a basis for the research. For example, in Western Kenya, there is always a season, where flooding occurs, leaving thousands of people homeless, not to mention infections and spread of chronic diseases such as cholera. Further, drought seasons are common in the north and northeastern provinces, which have resulted in numerous deaths and a severe decline in malnutrition rates. As these are recurrent calamities/disasters, it would be prudent of the government to initiate research, whilst drawing from experiences of other countries, and implement recommendations aimed at containing these situations.

Further research could also be under taken in establishing early warning systems that would contribute to the Disaster Mitigation Policy.

In looking at the larger picture, further research could be carried out on other natural disasters that would affect the country, e.g. earthquakes, with the aim at drawing up policies and enhancing preparedness in the event of occurrence.

And last and by no means the least, research should be carried out on the capacity of all national and provincial hospitals in providing medical care, not only for emergencies, but also for other ailments affecting the less fortunate in society. It has been evident during this research that national hospitals do not have the necessary support in handling emergencies.

Bibliography

Abstracts For III Nordic Congress on Disaster and Emergency Medicine. June 1998 *Prehospital and Disaster Medicine,* USA

American Society for Industrial Security, ASIS. 1994. *Emergency Planning Handbook.* USA.

American Society for Industrial Security. *Emergency Planning Handbook,* USA, 1994

Barren, M.R., Beigel A. Barker G,: *A typology of the classification of disasters:* Implications for intervention community mental health journal 18 (2): 20-34

Bowers WR et al. 1960 *Surgical Philosophy in Mass Casualty Management,* Springfield IL

Buchanan D, Freeman C. *Statewide Disaster Medical Standards Development Project (Final Report),* www.mvemsa.com. 2000.

Carter W. 1984. *Procedures and Guidelines for Disaster Preparedness and Response.* Royal Military College of Science. Pacific Island Development Programme. Swindon.

Cohen, R.E. and Ahern, F.L.: *Handbook for mental health care of disaster victims:* john Hopkins University, Baltimore U.S.A 1980.

Cole G A. 1997. *Personnel Management.* Letts Educational. Aldine Place London.

Conference Report, *International Emergency Health and Development, Washington* (USA), 15-18 Aug 1989. www.medbc.com.

Davinder Lamba 1994 *Nairobi's Environment: A review Of Conditions And Issues.* Mazingira Institute

Demas & Rosenthal. *Automobile Accidents,* www.injury-attorneys.com. 2003.

Drabek T E. 1986. *Human system responses to disaster: and inventory of sociological findings.* Springer-Verlag. New

Drabek, T. (1986): *Human Systems Response to Disaster.* New York. Springer - Verlag

Dynes, R.R (1981).: *A perspective on disaster planning ed3.* University of Delaware. Newark.

Emergency Planning Handbook. *American Society for Industrial Security.* 1994.

Erickson, K. *(1979).: In the wake of the flood.* London, George Allen and Urwin.

Eriksen, K (1977). Human Services Today. Reston, VA:Reston Publishing Company.

Fakir Saliem 1998 *Green Paper on Disaster Management.* www.polity.org.za. .

Gurry G. (1965).: *Immediate care and Transport of the injured.* Illinois, Charles, C., Thomas publisher.

Heide Erik Auf der. 2000. *Disaster Response: Principles of Preparation and Coordination.* Online edition. http://coe-dmha. org / dr / static, htm.

Hersche B. *The Casualty Handling System,* www.ispub.com.

KAEMT. History of KAEMT. www.KAEMT.htm.

Kallsen (1983).: *Collapse of Coalinga,* Journal of Emergency Medial Services, 8 (2):24

Mahogany, R. (1966).: *Emergency and Disaster Nursing.* Macmillan New York. USA.

Multiple Casualty Incidents. 2001 *Incident Command System.* www.collegeofparamedics.org..

Nairobi City Council 2001 **Nairobi International Show Brochure**

Office of the President, Kenya. October *2001 Draft On National Policy On Disaster Management.*

Ojanji W. March 8, 2001 *Move to improve Disaster Response Capacity. Daily Nation,* Nairobi, Kenya

Ojanji W. March 29 2001 *What's Being Done to Manage disasters? Daily Nation,* Nairobi, Kenya

Opala K. March 27, 2001 *Disaster Response Pathetic. Daily Nation,* Nairobi, Kenya

Petak, W. J. 1985. *A Challenge for Public Administration.* American Society for Public Administration. Washington.

Petak, W.J (1985). *Emergency management:* a challenge for public administration (special issue). American Society for Public Administration, Washington.

Quarantelli E.L, 1983, 88 *Delivery of emergency medical serinces in disasters of emergency medical services in disasters. Assumption and realities,* Irrington New York,

Quarantelli, E.L 1993. *Delivery of Emergency Medical Service in Disaster: Assumption and realities* Irvington, New York.

Raphael, B (1968). When Disaster Strike: How individuals and communities cope with catastrophe: Basic books publishers. New York, USA.

Reynolds S and Wright JE, 1976 *A Selective Literature Review of Disaster Medical Services, Working Paper No. 64,* Disaster Research Center, University of Delaware, Newark

Ritzer George, *1996 Sociological Theory, 4th Edition,* McGraw Hill Companies Inc, USA

Rund DA and Rausch TS. 1996 *Fire Communication Centre: Report of regional disaster medical plan evaluation,* Unpublished, Sacramento, CA

Sayah Assad J MD. *EMS Systems,* www.emedicine.com.

Schapiro M. September 2002.A *First Hand Account: Zaka Volunteer First on the Scene at Tuesday Morning Terror Attack.* County Yossi Magazine,

Stevenson L and Hayman M. 1981. *Local government disaster protection: final technical report. International City Management Association.* Washington D.C.

Tierney, K.J (1983:29^: *Report on the Coalinga earthquake.* Sacramento, USA.

United Nations - Office for the Coordination of Humanitarian Affairs, Geneva Swtizerland, 2000, *United Nations Disaster Assessment and Coordination - UNDAC Field Handbook*

United Nations 2000 *Assistance to Victims of Road Traffic Accidents.* www.FEVRmanifestazioni nazionali e internationali.htm..

White T L W, Silberman L, Anderson P R. 1948 *Nairobi: Masterplan For A Colonial Capital. His Majesty's Stationary Office.* London,U.K

Wisner B Dr. 2001 *Radical interpretation of Disasters.* www.Radix-PreliminarvQuestions.com.

Annex I: Interview guide for Key Informant, Focus Group Discussions and Unstructured Interviews

Information on Structure
As mandated by the Nairobi City Council, what is your role in responding to emergency situations?
What support does the Nairobi City Council provide to you?
What are the sources of your funding?
What does your organization define as an emergency?
Do you have Disaster Management Policies in place?

Equipment
What equipment do you have in place to respond to an emergency?
Does this adequately support your response?
How often do you upgrade?

Response structure
Do you have set procedures/guidelines to respond to an emergency?
What mechanism is in place to respond to calls of emergency (communication)?
Who is the lead in a response?
What are the steps you take in this response?
Who are your coordinating partners respond to emergency situations.
Do you have a contingency plan?
Do you charge for services rendered?

On average, how many response would you make in a week?

Personnel
What criteria are used in identifying personnel who make up the response team?
What training has been provided to you to enable you respond to emergencies?
Morale!

Communication
Do you prepare reports post-response??
Are these available for reference?
How do you deal with the media?
What is the communication structure?
How do the public access you?

Annex II: Organizational Structure of the Nairobi City Council

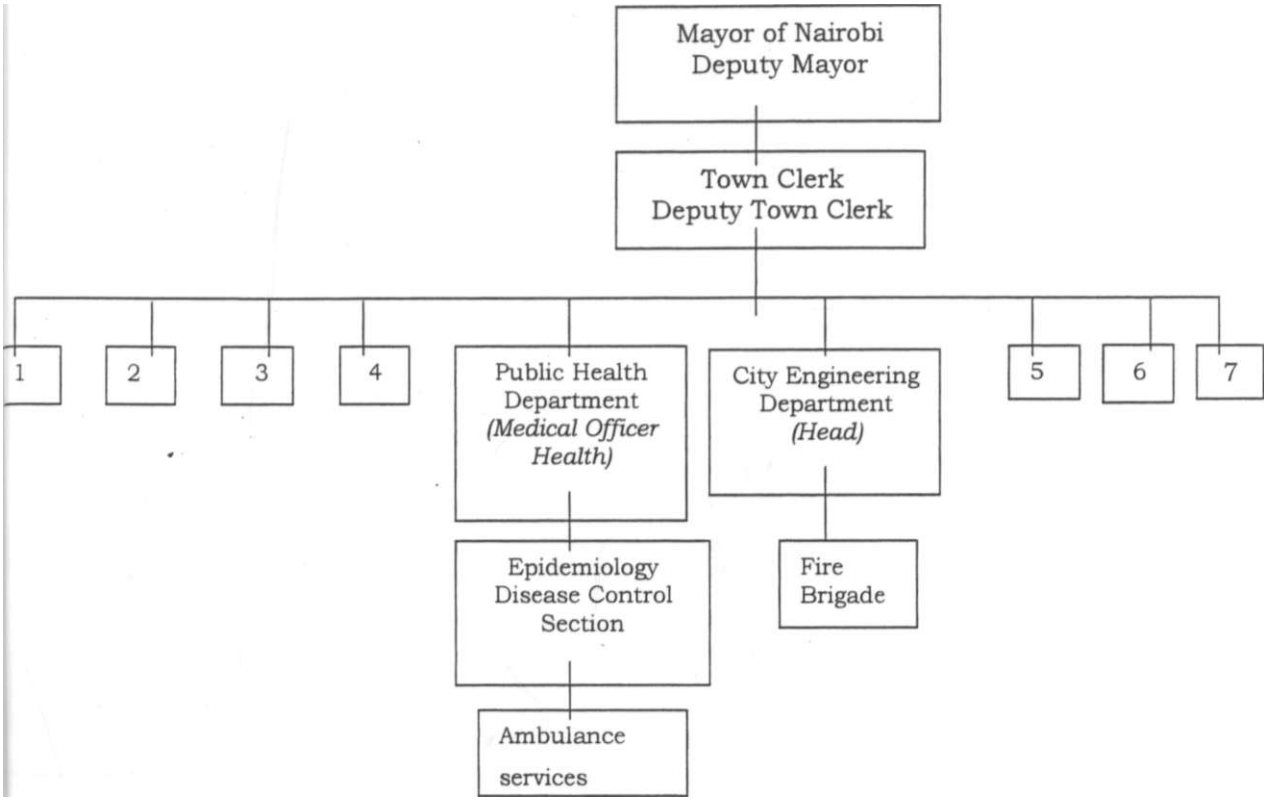


Fig. A.1: Organizational Chart: Nairobi City Council; Source, Nairobi City Council Brochure 2003

The following departments also fall under the Town Clerk and are supported by various section and sub-section heads.

1. City Treasury Department, *City Treasurer*
2. City Education Department, *(Director)*
3. City Inspectorate Department, *(Director)*
4. City Planning & Architecture, *(Director)*
5. Social Services & Housing Department, *(Director)*
6. Department of Environment, *(Director)*
7. Housing Development Department, *(Director)*

Note: This organigramme reflects the hierarchical position of the Ambulance services and the fire brigade in the Nairobi City Council Structure.