DISASTER PREPAREDNESS AMONG MEMBERS OF STAFF AT KENYATTA NATIONAL HOSPITAL, NAIROBI COUNTY, KENYA

BY

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MARCH 2015
DECLARATION

This research report is my original work and has never been submitted or presented to any school, college or other institution of higher learning for an academic award.

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DEDICATION

I dedicate this work to my loving wife Rachel, my children and grandchildren, a great friend and mentor Gathura Njenga for their prayers, encouragement, financial and moral support. They stood with me throughout the entire course. They were very understanding when I was often not available to them due this research.
ACKNOWLEDGEMENT

I would like to first acknowledge the Almighty God who gives me the courage and strength to face the different challenges in life and acquiring the information needed for the study.

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<th>Description</th>
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<tbody>
<tr>
<td>EM-DAT</td>
<td>Emergency Disasters Database</td>
</tr>
<tr>
<td>GOK</td>
<td>Government of Kenya</td>
</tr>
<tr>
<td>HFA</td>
<td>Hyogo Framework for Action</td>
</tr>
<tr>
<td>ICU</td>
<td>Intensive Care Unit</td>
</tr>
<tr>
<td>KNH</td>
<td>Kenyatta National Hospital</td>
</tr>
<tr>
<td>MOH</td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>RDIC</td>
<td>Regional Disaster Information Center</td>
</tr>
<tr>
<td>UN</td>
<td>United Nations</td>
</tr>
<tr>
<td>UNDP</td>
<td>United Nations Development Program</td>
</tr>
<tr>
<td>UNHCR</td>
<td>United Nations High Commission for Refugees</td>
</tr>
<tr>
<td>UNISDR</td>
<td>United Nations International Strategy for Disaster Reduction</td>
</tr>
<tr>
<td>USA</td>
<td>United States of America</td>
</tr>
<tr>
<td>WCDR</td>
<td>World Conference on Disaster Reduction</td>
</tr>
<tr>
<td>WHA</td>
<td>World Health Assembly</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
<tr>
<td>WHO-AFRO</td>
<td>World Health Organization African Region</td>
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<tr>
<td>WHO/WPR</td>
<td>World Health Organization Western Pacific Region</td>
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DEFINITION OF KEY TERMS

Disaster: A disaster is a serious disruption of the functioning of a community or society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community/society to cope using its own resources.

Disaster management: Disaster management is the organized analysis, planning, and decision-making, allocations of resources, roles and responsibilities to prepare, prevent, mitigate, respond and recover/rehabilitate from disruptions by disasters.

Functional Vulnerability: elements that can interfere with the operations/functions of a facility in times of disaster

Mitigation: These are measures undertaken to limit adverse effects that may result from a hazard.

Preparedness: These are activities and measures undertaken in advance to ensure effective response to the impact of hazards, including the insurance of timely and effective early warnings, temporary evacuation of people and property from threatened locations

Structural Vulnerability: structural elements of the buildings, for example, load bearing walls, columns, beams, floor and roof

Vulnerability: A condition wherein human settlements, buildings, agriculture, or human are exposed to a disaster by virtue of their construction or proximity to hazardous terrain.
ABSTRACT

Over the world, hospitals have suffered severe damage as a result of natural and anthropogenic disasters leading to the partial or total collapse of the structures and interruption of the health services urgently needed by the victims of the event. During the disaster strike, hospitals are confronted with a large number of casualties exceeding their capacity to cope. Despite the situation, many governments have paid less attention to disaster preparedness in health facilities. Hospitals from various parts of the world possess limited capital and staff time to spend on conducting comprehensive disaster response drills, emergency planning and preparedness. The main objective of this study was to find out whether members of staff at Kenyatta National Hospital are prepared for disasters. The study also looked into structures that the Kenyatta National Hospital has put in place to mitigate for disaster. This was a cross sectional descriptive study. Data collected in this study was both quantitative and qualitative. Data was collected using self-administered questionnaire containing both closed and open ended questions. The study involved 361 respondents sampled from 4646 being the total population of members of staff at Kenyatta National Hospital. The respondents were stratified according to departments of the hospital and then randomly selected based on the required sample size. Data was analyzed using the Statistical Package for Social Sciences (SPSS) version 16.2 and Microsoft office excel. The study established that terrorist attack is the leading potential threat followed by fire. Most members of staff of KNH were aware of the existence of a disaster management committee and the existence of a disaster plan in the hospital. Majority of the respondents felt that firefighting equipments and evacuation plans are inadequate. The results have been presented in tables and charts. Chi square was used to determine association and difference between responses. Terrorist attack and fire were identified as the main potential threats with 84% and 81% of the respondent identifying them as potential disasters respectively. The study found out that 58% of the respondents had no training on disaster management. Majority of the respondents indicated that there was no adequate infrastructure to manage disaster with 62.3 % indicating there was inadequate fire fighting equipments. The findings showed a significant association between age and disaster preparedness ($X^2=13.202$, df=9, p=0.002); training on disaster management and disaster preparedness ($X^2=34.738$, df=3, p=0.001); years of experience and disaster preparedness ($X^2=13.202$, df=12, p=0.007); level of awareness and disaster preparedness ($X^2=8.477$, df=1, p=0.004). The study will assist KNH and other health facilities in formulating policies on disaster preparedness. The study recommends that Kenyatta national Hospital improves on the training of staff on disaster management in order to respond to emergencies effectively and efficiently.
CHAPTER ONE: INTRODUCTION

1.1 Background to the study

Disaster preparedness are activities and measures undertaken in advance to ensure effective response to the impact of hazards, including the insurance of timely and effective early warnings, temporary evacuation of people and property from threatened locations. Mitigation is a reduction in how unpleasant or serious an effect is (Hornby, 2010). Hence disaster mitigation is eliminating or reducing the threats of a disaster as much as possible and as appropriate. Health facilities can be affected by natural phenomena such as earthquakes, hurricanes, landslides, volcanic eruptions, and floods. They can also be damaged by anthropogenic (that is, man-made) events such as fires, gas leaks or explosions. (WHO, 2000). Disaster Mitigation in Hospitals includes many actions which include, improved design of new health care facilities, retrofitting of old healthcare facilities, national policy and guidelines, hospital Disaster Preparedness Plan, testing the plan, revising and updating the plan and vulnerability analysis. The various measures have different implementation methods and costs. The simplest and most economical have to do with nonstructural and administrative and organizational aspects; the most complex and costly are the structural measures. If an integrated hospital mitigation plan is carried out in stages, the use of resources can be spaced out over time, making it easier to keep the additional expenses within a reasonable margin of ongoing maintenance costs. (UNISDR, 2008)

Disaster preparedness is the Process of ensuring that an organization has complied with the preventive measures, and is in a state of readiness to contain the effects of a
forecasted disastrous event to minimize loss of life, injury, and damage to property (PAHO, 2000).


KNH being a national referral hospital must undertake preparedness planning not only because disasters may impact any size facility anywhere in the country but also because it is a requirement for hospitals to have an emergency management plan.

1.2 Statement of the problem

In disaster situations, the main responsibilities of the health sector are to save lives, reduce permanent disability, provide medical services to the injured, and reduce the risk of disease and death due to illness or other health risks. These responsibilities can only be carried out if the health services remain fully operational. Most often, most of health facilities are not prepared for disasters whenever they strike (IGAD, 1998).

As the largest health facility in Kenya, Kenyatta National Hospital (KNH) is a critical health facility as it receives many disaster victims from all corners of the country. The hospital has also been faced by disasters in the past. One of the most notable ones is a fire in the hospital’s cardiology department which led to the closure of the department for over a year in 2011. A Statutory Safety and Health Audit carried out at Kenyatta National Hospital in August 2012 indicated that KNH does not have sufficient infrastructures to prepare for disasters (KNH, 2012). Determining a hospital’s capabilities to handle
disasters can only be done by assessing the current level of preparedness and establishing the areas where more needs to be done to improve the preparedness (MOH, 2010).

1.3 Justification

Data on disaster fail to capture the full extent of damage inflicted by natural and anthropogenic hazards to hospitals. Few studies have been done in the area of disasters preparedness in health facilities in Kenya and none has been documented in Kenyatta National Hospital. This study is expected to contribute to the knowledge base on disaster preparedness in Kenyatta National Hospital. The study is useful to the management at the hospital since one of the functions of the management is to ensure that the facility is safe at all times. Those who may be interested in the area of disaster preparedness could also benefit from the study findings. Finally, the study will provide a reference to other researchers who might want to undertake research in the area of disaster preparedness.

1.4 Research Questions

1. What are the potential disasters that can face KNH?

2. What is the staff’s level of knowledge and training on disaster preparedness?

3. How is KNH prepared to handle disasters?

1.5 Null Hypothesis

Level of knowledge and training among members of staff in KNH is not associated with disaster preparedness.
1.6 General Objective

The main objective of this study is to assess the state of disaster preparedness among members of staff at the Kenyatta National Hospital.

1.7 Specific Objectives

1. To determine the potential disasters that can occur in KNH.

2. To establish level of knowledge and training among members of staff on disaster preparedness at KNH.

3. To establish KNH’s state of preparedness to handle disasters.

1.8 Significance of the study

The study findings will be useful to the KNH management for planning, policy revision and development. The study documented the effectiveness of disaster management policy, and identified the vulnerability factors and health risks at KNH. The study also created awareness and agitated for advocacy among the members of staff.

The study was beneficial to the researcher as it adds to the knowledge gained in class rooms. The study would also help the upcoming researchers select areas for studies based on the study recommendations. The interventions that were recommended by this study will benefit individuals and employees in that the work environment would be safe.

1.9 Scope and limitations of the study

One of the limitations of this study was obtaining information from the top management where some were having busy schedules to participate in the study but I finally managed
to interview them. The study was also limited by the inadequate local literature. Funds required to conduct the study to the final stage was limited. Time was a constraint. I overcame this limitation by taking annual leave to carry out the study. Written permission from National Commission for Science, Technology & Innovation (NACOSTI) took so long to acquire delaying the study.

1.10 Conceptual Framework

The identification of the potential disasters that members of staff felt were likely to occur in KNH and level of knowledge and training on disaster management would have an effect on disaster preparedness. Age, training and years of experience would most probably influence disaster preparedness. Undoubtedly, disaster preparedness in hospital setting is a function of potential disasters, knowledge and training on disaster management, and socio-demographic characteristics of staff (education, age, gender and years of experience).

Figure 1.1: Conceptual Framework

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Dependent Variables</th>
</tr>
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<tbody>
<tr>
<td>Potential disasters</td>
<td>Disaster Preparedness</td>
</tr>
<tr>
<td>Knowledge and training on disaster management</td>
<td></td>
</tr>
<tr>
<td>Social Demographic Characteristics (Education, Work experience, Gender)</td>
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</tbody>
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Source: Adopted and adjusted from Huberman (1994)
CHAPTER TWO: LITERATURE REVIEW

2.1 Disaster preparedness

Disasters have surely caused widespread destruction, disrupting people’s lives and causing human suffering with communities finding it difficult to cope. When disasters occur, human beings may not have the power to stop them from occurring, but they certainly have the power and ability to adapt, survive, and minimize the impact of the disaster on their lives. Disasters have a potential of producing mass casualties thereby straining the health care systems. This means that hospitals need to be prepared for an unusual increase in workload, hence the importance of hospital disaster preparedness (APHA, 2010). Disaster risk reduction has become important because of the frequency with which disasters have been occurring and the impact they have had on development. Disasters have affected efforts to achieve Millennium Development Goals, particularly the target of halving extreme poverty by the year 2015 (UNDP, 2004). This is because disasters cause diversion of resources needed by developing countries to escape poverty (ISDR, 2007). This is why it is important to have Disaster Risk Reduction measures in place, to reduce the impact of disasters. The importance of reducing disaster risk is shown by the various efforts being made by different governments, the United Nations and other organizations. These efforts include the Yokohama strategy of 1994 and later the Hyogo Framework for Action 2005-2015 aimed at building resilience of nations and communities to disasters with an expected outcome of a substantial reduction of disaster losses in lives and in the social, economic and environmental assets of communities and countries (UNDP, 2004)
2.2 Disaster mitigation

Disaster mitigation is a component of disaster management and is an element of disaster preparedness. Disaster mitigation includes policies, guidelines and legislations that are put in place to manage disasters. Disaster mitigation is eliminating or reducing the threats of a disaster as much as possible and appropriate. Health facilities can be affected by natural phenomena such as earthquakes, hurricanes, landslides, volcanic eruptions, and floods. They can also be damaged by anthropic (i.e., man-made) events such as fires, gas leaks or explosions (WHO, 2000).

The various mitigation measures have different implementation methods and costs. The simplest and most economical have to do with nonstructural and administrative and organizational aspects; the most complex and costly are the structural measures. If an integrated hospital mitigation plan is carried out in stages, the use of resources can be spaced out over time, making it easier to keep the additional expenses within a reasonable margin of ongoing maintenance costs (UNISDR, 2008).

2.3 Potential Threats to Health Facilities

The threat of sudden disruption in the health care system and serious danger to life and health on a large scale seized the attention of the public health community (and the nation) in the 1990s. This was due to the threat of terrorism, spurred by the bombings in a parking garage at the World Trade Center and at the federal office building in Oklahoma City and a poison gas release in the Tokyo subway system. Congress responded by passing legislation that established a domestic preparedness program and broadened the mandate of the Federal Emergency Management Agency (FEMA) to include attacks by
weapons of mass destruction as well as natural disasters. In 1998, the Centers for Disease Control and Prevention (CDC) established the Bioterrorism Preparedness and Response Program, which improved laboratory, surveillance, and emergency response communication capabilities. In addition, in this same year, CDC was authorized by Congress to establish a national stockpile of pharmaceuticals and vaccines (CDC, 2010).

Needless to say, such concerns increased exponentially in the aftermath of the terrorist attacks of September 11, 2001, and the use of anthrax as a means of bioterrorism shortly thereafter. After Hurricane Katrina and the flooding of New Orleans and other areas of the Gulf Coast, and amid concerns about pandemic influenza and other infectious diseases, public health preparedness has shifted from bioterrorism to an all-hazards approach and orientation. This approach is now recognized as being central to the public health mission and has been a focal point of a massive infusion of funding, manpower, training, and other resources during the last several years at the federal, state, and local levels (Christopher, 2007).

During a natural disaster, many hospitals may suffer water and wind damage; some may have standing water for an extended period of time due to flooding. Building structures, equipment, and supplies may be heavily contaminated with microorganisms such as mold, mold spores, and bacteria. Before reopening, hospitals must be evaluated to determine if the facility is damaged beyond repair and must be condemned; or if the extent of the damage is such that the facility may be restored, repaired, and reopened. Once the decision is made to repair and reoccupy the building(s), damaged or contaminated materials and structures must be removed and discarded, while salvageable materials and items can be thoroughly dried, repaired, cleaned, and restored to safe
function. The restoration of a hospital to full function is a complex, multidisciplinary task, and the assistance of engineers, professionals trained in building remediation, and manufacturers of healthcare equipment will likely be necessary to complete the job. Once the work to restore the building is finished and the building is returned to service, periodic inspection of the remediated structure will be necessary to identify mold growth and initiate removal and control measures. Clinical- and laboratory-based surveillance in the healthcare facility for unusual clusters of infectious diseases due to pathogens in the environment will also be essential (Cliff, 2008).

2.4 Knowledge and risk perception

Inaccurate perception of risk is something that affects all people and all cultures, regardless of education, background, or income, among other factors. People perceive risks as being either too great or too small. The study of risk perception is so important because it helps to better determine what emergency communicators must do to correct perceptions through communication, and in turn, influence behavior that more appropriately addresses individuals’, communities’, and entire countries’ hazard profiles. (Coppola, 2006).

Risk perception is the subjective judgment that people make about the characteristics and severity of a risk. The phrase is most commonly used in reference to natural hazards and threats to the environment or health, such as nuclear power. Several theories have been proposed to explain why different people make different estimates of the dangerousness of risks. Three major families of theory have been developed: psychology approaches (heuristics and cognitive), anthropology/sociology approaches (cultural theory) and
interdisciplinary approaches (social amplification of risk framework (Kasperson, 2005)

Risk analysis is the process of identifying credible threats that could cause an interruption in an organization’s business. It is important to recognize that some risks can come from within, for example, an organization that has a kitchen on its premises or one that stores hazardous cleaning chemicals onsite. Other risks come from external forces such as flood, fire, among others.

The potential may include fire, water damage, explosion, physical security, loss of power, and natural disaster. A thorough risk analysis should take into account an organization’s physical surroundings, and includes such things as security, emergency lighting in halls and stairways, fire escape routes and exits, storing of toxic chemicals, etc. An analysis of risk, done by a numerical rating system (which is somewhat subjective), quantifies (again subjectively) the possible threats and also looks at ways to reduce the threats. This is also known as disaster avoidance. Some threats can be mitigated or avoided. While a natural disaster can’t be prevented, a plan of what to do if such a catastrophe occurs can be made.

Test the plan to be sure that it works and that the resources that are indicated in plan actually exist. For example, if a plan for evacuation of the building says that there are two fire exits on the 5th floor, it should be confirmed that there are in fact two exits there and that they both work. Are the fire extinguishers actually where the plan says they are? Or backup tapes of computer data: they may be taken offsite regularly, but have they ever been tried to restore them to make certain that they would work correctly? Testing of a plan can be done on the desktop by looking at the plan as written and speculating as to its worthiness and as an actual parallel operation where you physically execute all the steps of the plan and set up operations elsewhere (Cliff, 2008).
2.5 Health Sector Emergency preparedness

In a period of only 15 years, between 1981 and 1996, 93 hospitals and 538 health care centers in Latin America and the Caribbean were damaged as a consequence of natural disasters. This resulted in the loss of service of some 24,000 beds. The direct cost of these disasters has been enormous; just as devastating has been the social impact of the loss of these critical facilities at a time when they were most needed (PAHO, 2000).

Hospitals and health centers are complex; they have high occupancy levels and play a critical role in disaster situations. For these reasons, special consideration must be given to disaster planning for these facilities. Assessing and reducing their vulnerability to natural hazards is indispensable (PAHO, 2000).

Emergency preparedness in the health sector involves a logical process, with a series of activities ranging from formulation of policies, to continuous monitoring and evaluations, and this process is a dynamic process requiring constant improvements and fine tuning (UNDP Team-Nepa, 2001). There is need to develop policies in emergency preparedness to ensure that common goals are pursued by the different sectors and departments involved in emergency preparedness. Policies ensure the setting up of goals, assignment of responsibilities for achieving these goals to various organizations and sectors, and assist in the decision making process (Allen, 2006). Vulnerability assessments are important in that they assist communities identify, plan, prioritize and make informed decisions based on the hazards in their areas.

One of the major components of the hospital emergency preparedness process is that of planning. The planning process generates response measures and protocols, which can be documented in a written plan. It is, however, important to note that the written plan does
not guarantee preparedness (Morrow, 2007), but should be viewed as one of the elements of preparedness activities aimed at improving emergency response (Ansal, 2009). Protection of staff is one of the important philosophies of the hospital disaster preparedness process and should include provision of essential elements such as personal protective equipment (PPE) for common tasks and decontamination, immunization and chemoprophylaxis, training and education as well as development of policies to ensure that protective measures are appropriate and adequate (UN, 2003).

The impact from inadequate disaster planning by healthcare facilities and government disproportionately affects those individuals who are the most vulnerable following a disaster which includes children and the elderly (Bremer, 2003). According to Khan (2008) the following factors negatively impact the effectiveness of disaster response: poor coordination at the local level and the lack of an early warning system, very slow response times, limited number of trained and dedicated clinicians, lack of a systematic search and rescue system and equipment, and poor community empowerment and participation.

2.6 Functional Vulnerability

Functional vulnerability needs to be considered and eliminated for institutions, especially the critical facilities such as hospitals, emergency operation centers, communication centers, to ensure that the services provided by the facilities would keep on running to meet the demands of the community at the time when these are most needed (Leon and Villagran, 2006). According to Jain et al, (2008), functional vulnerability could range from site accessibility to service areas within the hospitals. Disadvantageous situation in terms of hospital’s location and accessibility include: when
the location is in a congested area of a city with vulnerable buildings around, when roads leading to the hospital are narrow secondary roads, presence of a bridge separating the hospital from the other areas- this could be very inconveniencing during a flood disaster that leads to the bridge being washed away. Holvorson and Hamilton (2007) also add that a hospital is also functionally disadvantaged when there is only one road leading to the hospital and the access road is in poor condition. Service area within the hospital, according to Jackson (2006) can also make a hospital be functionally vulnerable to disasters

2.7 Structural Vulnerability

This category of vulnerability pertains to the structural elements of the buildings, for example, load bearing walls, columns, beams, floor and roof (Allen, 2006). These structural elements should be appropriate to the building location and the natural hazards common in the country (Birkmann, 2006). Haider (2006) noted that the terrain where the hospital or health facility is located may indicate possible threats such as flooding in valleys or landslides along slopes. Non-structural elements of a building include architectural elements (such as ceilings, windows and doors). These elements are crucial to the daily operation of hospitals and health facilities. If these are damaged, they would not be able to function and may even cause physical injury to patients and personnel (Cannon, 2008).

2.8. Health Facilities Preparedness for Disasters

Health facility preparedness for disasters, both natural and man-made, starts at the pre-planning preparedness to managing and overcoming disasters when they occur.
2.8.1 Network organizational structures

The operation of disaster management structures is often problematic at regional and district levels. Major problems include vertical communication between different levels of government as well as low levels of effectiveness in local structures for disaster management. Most countries have arrangements for the organization of disaster management at provincial and district levels. In Columbia, Turkey and Bangladesh each district or province makes its own arrangements for disaster management, calling on the national government if and when needed in accordance with the provisions of the national plan. In Bangladesh, local governments are experienced in dealing with repeated disasters in their own areas (IGAD, 1998).

Health care networking is an essential step in medical preparedness planning for mass casualty incidents. Hospital networking does not necessarily mean linking up of various health care facilities with communication networks. Network essential means a dynamic link between various health care facilities of a given geographical area for augmentation or optimization of available resources. It means that the district authorities must have the information about the available health resources in their area. The health care facilities have to be networked for Information, Materials, Manpower and Training.

Assessing the organization of the health sector and its response capability in disaster situations implies the development of a working methodology which allows the coverage of the entire health sector. Consideration should be given to the health structure's organization and functions, health institutions and technical programs, legislation, intrasectoral and intersectoral coordination, and other key areas relating to disaster response (PAHO, 1995).
**Damage assessment to the hospital**

Is the structural integrity of the building compromised? Is the emergency generator damaged? Are there alternative sources of essential utilities? Are elevators safe? Is the water system functional? Is water safe to drink? Are ceilings safe to work under? Are communication systems working? Is the sewage system working? Are the fire suppression and alarm systems working? Is there a water rationing plan in the event of water outage or other water problems? Is there a camera with adequate amount of film available to record damages to the building and equipment for insurance purposes? (Richter, 2006)

**Drills**

Disaster plans are no help to anyone unless they work. Other than during a disaster itself, the only way to actually test a plan is through organized drills. Do not focus totally on patient treatment. Depending on the disaster, there might not be much of a facility left to offer treatment. If the hospital is in a hurricane zone, utilize "table top exercises" to test preparation during certain time periods prior to landfall. Most planning is done in 24-hour increments (24-48 hours prior to landfall, zero-24 hours prior, etc.). Then focus can be on receiving patients (Richter, 2006).

**2.8.2 Network leadership**

Hospital disaster plans should prepare a hospital for any type of disaster that might happen. Extensive planning must occur utilizing the talents of many people throughout the organization. How your facility is prepared to "weather the storm" is as important as how it recovers from the storm. The efforts of the planning will result in how your
hospital will be able to serve the community after a disaster. The cycle of planning, exercising and rewriting is never ending. The more people are engaged in the process, the better prepared they will be.

One of the most significant factors contributing to strengthened healthcare preparedness is the emergence of Healthcare Coalitions, which, since its establishment, have involved collaboration and networking among hospitals and between hospitals, public health departments, and emergency management and response agencies. These coalitions represent the beginning of a coordinated communitywide approach to medical disaster response. If they can continue to be developed and strengthened around the country, coalitions would logically become the foundation of a more robust national disaster health and medical response capacity, to respond to catastrophic emergencies in which one community’s Healthcare Coalition could come to the assistance of another’s coalition (Waldhorn & Franco, 2008).

In order to network various health care facilities the district authority should analyze the available resources in terms of materials and trained manpower. This helps in assessing the existing capabilities and limitations (WHO, 2009).
CHAPTER THREE: MATERIALS AND METHODS

3.1 Introduction

This chapter describes the methods that the researcher used to gather data on population of study. There are various research methods and the choice was influenced by various factors that include: study objectives, available time of undertaking the research and various constraints. The approved study is based at the Kenyatta National Hospital.

3.2 Research Design

The study was of a descriptive, cross sectional study design. Descriptive because data was collected to answer questions concerning current status of disaster preparedness among members of staff at KNH and provide factual descriptive picture of the situation as it existed at the time of the study. Cross-sectional because data was collected at one point in time, that is, phenomena under study were captured as they were.

3.3 Variables

3.3.1 Independent Variables

The Independent Variables are Potential disasters that can face KNH, level of knowledge and training on disaster preparedness, KNH preparedness to handle disasters.

3.3.2 Dependent Variable

The Dependent Variable was disaster preparedness.
3.4 Location of the study

The study was conducted at Kenyatta National Hospital (KNH) in Nairobi County. KNH is located about 5km west of the Central Business District of Nairobi city (appendix 1 and 2). The hospital lies on a latitude of 1.3007° S and a longitude of 36.8070° E.

3.5 Study Population

The study population was the members of staff at Kenyatta National Hospital who total to 4646 and are distributed in various departments. A sample of 391 was selected. The study included all Kenyatta National Hospital management board employees. The study excluded employees who were away on leave, night duty or any other offs during the study. It also excluded any employee who was unwilling to participate in the study.

3.6 Sampling Technique

KNH was chosen purposively for its size in that the findings can be applied to any other health facility. All departments were involved in the study and respondents were drawn from them. The entire population was stratified into departments after which simple random sampling was used to get a proportionate number of respondents according to the size of the department.

3.7 Sample Size Determination

The Fisher’s formula was applied (Fisher et al., 1998).

\[ N = \frac{Z^2pq}{d^2} \]

Where,
\( n = \text{desired sample size} \)

\( Z = \text{standard normal deviate set at 1.96 at (95\% confidence level)} \)

\( P = \text{proportion of the targeted population that have the characteristic focusing in the study estimated at 50\%. In this study the particular characteristics are the members of staff at KNH and the members of the Disaster Management Committee.} \)

\( q = 1 - p \)

\( d = \text{degree of accuracy set at 0.05/ degree proportion of error that should be accepted in the study (0.05) that is 5\%} \)

Thus \( n = \frac{1.96^2 * (0.5 * (1 - 0.5))}{0.05^2} \)

Hence; \( n = \frac{(1.96 * 1.96) * (0.5 * 0.5)}{(0.05 * 0.05)} = \frac{1.96^2 * 0.5 * 0.5}{0.05^2} \)

\( = 3.8416 * 0.25 \)

\( n = 384.16 \)

For a population of 4646 of all members of staff at KNH

\( n_f = 384.16 \)

\( 1 + \frac{384.16}{4646} \)

\( n_f = 354.81 \)

This gives us approximately 355

The researcher added 10\% (36) of the sample as attrition to cater for any non response.

This gave a sample of 391
Note: The study issued 391 questionnaires and got a response of 361 with 30 respondents failing to return their questionnaires. Hence the results and findings of this study are based on the 361. The sample size was drawn as follows:

Table 3.1: Sample size

<table>
<thead>
<tr>
<th>STAFF AT KENYATTA NATIONAL HOSPITAL</th>
<th>DEPARTMENT</th>
<th>NO.EMPLOYEE</th>
<th>SAMPLE</th>
<th>Q/N RETURNED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Administration</td>
<td>263</td>
<td>22</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>2. Human Resource</td>
<td>75</td>
<td>6</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>3. Security and Safety Services</td>
<td>108</td>
<td>9</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>4. Catering Unit</td>
<td>177</td>
<td>14</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>5. Maintenance/Engineering</td>
<td>293</td>
<td>24</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>6. Corporate Affairs &amp; Communication</td>
<td>78</td>
<td>7</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>7. Supply Chain Management</td>
<td>85</td>
<td>8</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>8. Planning</td>
<td>36</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>9. Finance</td>
<td>124</td>
<td>11</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>10. Medicine</td>
<td>576</td>
<td>48</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>11. Surgery</td>
<td>789</td>
<td>64</td>
<td>62</td>
<td></td>
</tr>
<tr>
<td>12. Reproductive Health</td>
<td>242</td>
<td>20</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>13. Pediatrics</td>
<td>326</td>
<td>26</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>14. Health Information</td>
<td>219</td>
<td>19</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>15. Accident &amp; Emergency</td>
<td>152</td>
<td>12</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>16. Orthopedics</td>
<td>183</td>
<td>15</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>17. Laboratory Medicine</td>
<td>164</td>
<td>14</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>18. Farewell Home</td>
<td>19</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>19. Radiology &amp; Medical Imaging</td>
<td>49</td>
<td>5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>20. Radiotherapy/Cancer Treatment</td>
<td>50</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>21. Pharmacy, Therapeutic &amp; SPU</td>
<td>65</td>
<td>6</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>22. Nutrition</td>
<td>39</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>23. Rehabilitative</td>
<td>97</td>
<td>9</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>24. Medical Social Work</td>
<td>33</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>25. Public Health</td>
<td>37</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>26. Prime Care Centre</td>
<td>360</td>
<td>32</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>27. Infection Prevention Control</td>
<td>7</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>4646</td>
<td>391</td>
<td>361</td>
<td></td>
</tr>
</tbody>
</table>

3.8 Instruments and Methods

The study used questionnaires to collect quantitative data from the respondents. The questionnaires were administered by the researcher and research assistants. Town watching method was used as a participatory tool for participants (Ogawa, 2005) where observation was made of all the equipments and infrastructures available.

3.9 Data Quality Measures

3.9.1 Validity

A pretest study was conducted to test the validity of the instruments to be used where 10% of the sampled population was used in the test. After the issue of 10% of the questionnaires for the test, cronbachs alpha was used where any value of more than 0.5 indicated that the instruments were valid and gave good internal consistence during the study. The validity of instrument is the extent to which it does measure what it is supposed to measure. According to Mugenda and Mugenda (1999), validity is the accuracy and meaningfulness of inferences, which are based on the research results. It is the degree to which results obtained from the analysis of the data actually represent the variables of the study.

3.9.2 Reliability

Two research assistants were trained prior to data collection to ensure they collect the desired data. The researcher accompanied the assistants on different days to ensure accuracy.
3.10 Data Collection Techniques

The researcher and the assistants administered the questionnaires in person to ensure that all the questionnaires were collected back and sought clarifications in case of any problems.

3.11 Data Management and Analysis

3.11.1 Data Management

The researcher checked the filled questionnaire for completeness and made a follow up to ensure all questions were appropriately answered. The researcher then removed corrupt, incomplete, irrelevant or inaccurate records from the database by cleaning the data. The researcher then discarded any invalid questionnaire. Once questionnaires were completed the data collected was systematically arranged according to the codes of the questions to facilitate analysis. The data was stored in a computer. A password was used to secure the data base while the questionnaires were locked in a cabinet.

3.11.2 Data Analysis

Data was analyzed using SPSS package version 22. Descriptive statistics was computed based on the themes of the study, and the results were then presented in using of pie charts, bar charts and frequency tables, histograms and narrative text. Relationships were demonstrated through inferential statistics in chi square.

3.12 Logical and Ethical Consideration

The study obtained written permission from National Commission for Science, Technology & Innovation (NACOSTI) permit number NACOSTI/P/13/8651/77. Ethical clearance was granted by Kenyatta University Ethical and Research Committee
application number PKU/153/1 134. During data collection, the respondents were informed the objective of the study where they were provided with a written consent form to capture their willingness and to sign to participate in the research. The respondents were assured that the information they gave was confidential. No respondent was intimidated to respond in any particular way.
CHAPTER FOUR: RESULTS

4.1 Introduction

This chapter gives the study analysis that includes results, findings and interpretation from the analyzed data collected from the field.

4.2 Social demographic characteristics.

Table 4.1 describes the socio-demographic characteristics of the respondents. There were more female 188 (52%) than male respondents 173 (48%). The ages between 31-40 years 131 (36.4%) comprised the majority followed by 41-50 years 111 (30.7%). Respondents between 18-20 years represented the least group 9 (2.5%).

It was noted that 17 (4.7%) of the respondents had primary education or below with more than a third being technologists 127 (35.2%) and 44 (12.2%) were doctors. Nurses and others represented 98 (27.1%) and 92 (25.5%) of the respondents respectively. Majority of the respondents were in the job group K10-K5 accounting for 222 (63%) while the least number of the respondents were in the job group K4-K1 representing 22 (5%).
Table 4.1: Social demographic characteristics of the respondents

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Number</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>173</td>
<td>48</td>
</tr>
<tr>
<td>Female</td>
<td>188</td>
<td>52</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18- 20 Years</td>
<td>9</td>
<td>2.5</td>
</tr>
<tr>
<td>20-30 Years</td>
<td>61</td>
<td>16.8</td>
</tr>
<tr>
<td>31-40 Years</td>
<td>131</td>
<td>36.4</td>
</tr>
<tr>
<td>41-50</td>
<td>111</td>
<td>30.7</td>
</tr>
<tr>
<td>Above 50 Years</td>
<td>49</td>
<td>13.6</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary and below</td>
<td>17</td>
<td>4.7</td>
</tr>
<tr>
<td>Secondary</td>
<td>35</td>
<td>9.7</td>
</tr>
<tr>
<td>Tertiary</td>
<td>309</td>
<td>85.6</td>
</tr>
<tr>
<td><strong>Designation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctors</td>
<td>44</td>
<td>12.2</td>
</tr>
<tr>
<td>Nurses</td>
<td>98</td>
<td>27.1</td>
</tr>
<tr>
<td>Technologists</td>
<td>127</td>
<td>35.2</td>
</tr>
<tr>
<td>Others</td>
<td>92</td>
<td>25.5</td>
</tr>
<tr>
<td><strong>Job group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K4-K1</td>
<td>22</td>
<td>5</td>
</tr>
<tr>
<td>K5-K10</td>
<td>222</td>
<td>63</td>
</tr>
<tr>
<td>K11-K17</td>
<td>117</td>
<td>32</td>
</tr>
</tbody>
</table>
The findings indicates that the majority of the respondents 86 (24%) have worked at KNH for 15-20 years and 35 (10%) have worked for less than a year. (Fig 4.1)

Figure 4.1: Years worked at Kenyatta National hospital
4.3 Potential disasters in the hospital

Most of the employees in KNH dismissed any likelihood of a natural disaster occurring at the hospital 175 (49%) as compared to 113 (31%) who agreed. Most agreed to a likelihood of disease epidemics occurring 259 (72%), Chemical spills 214 (61%), fires 291 (81%), terrorist attack 302(84%) and food poisoning 247 (69%) were major possibilities of disasters (Fig 4.2).

Figure 4.2: Bar chart showing potential disasters in KNH
4.4 Knowledge and training among KNH staff

Table 4.2 presents results indicating extent to which the respondents agreed or disagreed with certain interventions as measures of disaster preparedness. The results revealed that the hospital had disaster management plan as reported by 66.7% (241), and existence of disaster management committee 279 (77.3%) Majority claimed they were not aware of the hospital having regular emergency drills (43.5%), there was also almost similar proportions who thought adequate staffing (39.1%) would improve disaster preparedness against 39.6% who thought otherwise. It was noted that a third of the respondents had no idea of the contents of disaster management Plan. Similarly, at least 13% were not sure of presence of disaster management plan, disaster committee, disaster management training and availability of protective gear and equipment in case of infectious disease outbreak.

Table 4.2: Signs of Hospital’s preparedness for disasters

<table>
<thead>
<tr>
<th>Knowledge and training</th>
<th>Response</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presence of hospitals disaster management plan</td>
<td>Agree: 241 (66.7%)</td>
<td>3.8 (1.06)</td>
</tr>
<tr>
<td></td>
<td>Not sure: 68 (18.8%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disagree: 52 (14.5%)</td>
<td></td>
</tr>
<tr>
<td>Existence of disaster management committee</td>
<td>Agree: 279 (77.3%)</td>
<td>4.1 (0.99)</td>
</tr>
<tr>
<td></td>
<td>Not sure: 47 (13.0%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disagree: 35 (9.7%)</td>
<td></td>
</tr>
<tr>
<td>Familiarity of the contents of disaster management plan</td>
<td>Agree: 146 (40.4%)</td>
<td>3.1 (1.22)</td>
</tr>
<tr>
<td>management plan by all members of staff</td>
<td>Not sure: 101 (28.0%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disagree: 114 (31.6%)</td>
<td></td>
</tr>
<tr>
<td>Emergency/disaster management training for all staff member</td>
<td>Agree: 171 (47.4%)</td>
<td>3.1 (1.3)</td>
</tr>
<tr>
<td></td>
<td>Not sure: 59 (16.3%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disagree: 131 (36.3%)</td>
<td></td>
</tr>
<tr>
<td>Adequate staffing</td>
<td>Agree: 141 (39.1%)</td>
<td>3.0 (1.26)</td>
</tr>
<tr>
<td></td>
<td>Not sure: 77 (21.3%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disagree: 143 (39.6%)</td>
<td></td>
</tr>
<tr>
<td>Regular emergency drills</td>
<td>Agree: 142 (39.3%)</td>
<td>2.9 (1.31)</td>
</tr>
<tr>
<td></td>
<td>Not sure: 62 (17.2%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disagree: 157 (43.5%)</td>
<td></td>
</tr>
<tr>
<td>Availability of personal protective equipment</td>
<td>Agree: 159 (44.0%)</td>
<td>3.0 (1.36)</td>
</tr>
<tr>
<td></td>
<td>Not sure: 64 (17.7%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disagree: 138 (38.3%)</td>
<td></td>
</tr>
</tbody>
</table>
4.4.1 Knowledge on disaster management

Figure 4.3 above displays that majority 209 (58%) of the respondents has never had any training on disaster management. Of the 152 (42%) trained, about 12 (7.9%) have been trained to a certificate level with the remaining 140 (92.1%) having undergone a one week in-house course on disaster management and preparedness.

Figure 4.3: Training on disaster management of the respondents
4.4.2 Level of knowledge on disaster management

Figure 4.4 shows that majority of the respondents 163 (45.2%) had a fair knowledge on disaster management. Only 31 (8.6%) had excellent knowledge on disaster management.

Figure 4.4: Level of knowledge on disaster management
4.4.3 Factors contributing to level of knowledge

The study results in Table 4.3 indicate factors contributing to knowledge on disaster management in KNH. There was no difference on disaster management knowledge among male and female (P=0.631; \( \chi^2 = 9.570 \)) respondents. In contrast, a higher proportion (12%) with 50 years and above had excellent knowledge compared to those with between 31-40 years. The respondents age was associated with knowledge on disaster management knowledge (P<0.05). In terms of training on disaster management, those trained had good knowledge (50.7%) as compared to 26.8% not trained and was statistically significant (P<0.05). Similarly, years worked in KNH played a role on knowledge on disaster management. There was a larger proportion (31.3%) of those who have worked between 10-15 years when compared to 49.5% who have worked between 15-20 years.

Table 4.3: Factors contributing to knowledge on disaster management

<table>
<thead>
<tr>
<th>Variable</th>
<th>Knowledge on disaster management</th>
<th>Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Excellent</td>
<td>Good</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>16(9.2%)</td>
<td>70(40.5%)</td>
</tr>
<tr>
<td>Female</td>
<td>15(8.0%)</td>
<td>63(33.5%)</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 30</td>
<td>6(9.2%)</td>
<td>26(40%)</td>
</tr>
<tr>
<td>31-40</td>
<td>7(5.3%)</td>
<td>44(33.4%)</td>
</tr>
<tr>
<td>41-50</td>
<td>11(9.6%)</td>
<td>42(32.1%)</td>
</tr>
<tr>
<td>Above 50</td>
<td>6(12.0%)</td>
<td>19(38.0%)</td>
</tr>
<tr>
<td>Trained on DMP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>19(12.5%)</td>
<td>77(50.7%)</td>
</tr>
<tr>
<td>No</td>
<td>12(5.8%)</td>
<td>56(26.8%)</td>
</tr>
<tr>
<td>Years worked in KNH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;5</td>
<td>8(8.6%)</td>
<td>35(37.6%)</td>
</tr>
<tr>
<td>5-10</td>
<td>5(11.9%)</td>
<td>15(35.7%)</td>
</tr>
<tr>
<td>10-15</td>
<td>8(10%)</td>
<td>25(31.3%)</td>
</tr>
<tr>
<td>15-20</td>
<td>9(10.8%)</td>
<td>41(49.5%)</td>
</tr>
<tr>
<td>&gt;20</td>
<td>6(9.5%)</td>
<td>20(31.7%)</td>
</tr>
</tbody>
</table>

Note: DMP – Disaster Management Preparedness
4.3.4 Disaster preparedness and level of perception

Table 4.4 shows that 75.9% of the respondents agreed there were insufficient infrastructures, 62% agreed there was poor coordination in times of disasters.

### Table 4.4: Disaster preparedness

<table>
<thead>
<tr>
<th>Factors of disaster preparedness</th>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insufficient infrastructure</td>
<td>87 (24.1%)</td>
<td>274 (75.9%)</td>
</tr>
<tr>
<td>Poor coordination in times of disaster</td>
<td>137 (38.0%)</td>
<td>224 (62.0%)</td>
</tr>
<tr>
<td>Limited trained staff</td>
<td>129 (35.7%)</td>
<td>232 (64.3%)</td>
</tr>
<tr>
<td>Lack of emergency training and drills</td>
<td>91 (25.2%)</td>
<td>270 (74.8%)</td>
</tr>
</tbody>
</table>

### Level of knowledge and training

Table 4.5 indicates 85.9% of the respondents agreed that the existing infrastructure was inadequate and needed up grading, 93.1% agreed there should be regular emergency drills.

### Table 4.5: Level of knowledge and training

<table>
<thead>
<tr>
<th>Factors of level of knowledge and training</th>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up gradation of hospital infrastructure</td>
<td>51 (14.1%)</td>
<td>310 (85.9%)</td>
</tr>
<tr>
<td>Training all members of staff on disaster management</td>
<td>21 (5.8%)</td>
<td>340 (94.2%)</td>
</tr>
<tr>
<td>Performing regular emergency drills</td>
<td>25 (6.9%)</td>
<td>336 (93.1%)</td>
</tr>
<tr>
<td>Improve on coordination at times of disaster</td>
<td>27 (7.5%)</td>
<td>334 (92.5%)</td>
</tr>
</tbody>
</table>
Table 4.6 indicates there is an association between disaster preparedness and level of awareness, p=0.004. The null hypothesis that Disaster preparedness among members of staff in KNH is not associated with level of knowledge and training is disapproved.

Table 4.6: Association between disaster preparedness and level of awareness

<table>
<thead>
<tr>
<th>Disaster preparedness</th>
<th>Level of knowledge and training</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not aware</td>
<td>Aware</td>
</tr>
<tr>
<td>Not prepared</td>
<td>20 (5.5%)</td>
<td>110 (30.5%)</td>
</tr>
<tr>
<td>Prepared</td>
<td>14 (3.9%)</td>
<td>217 (60.1%)</td>
</tr>
<tr>
<td>Total</td>
<td>34 (9.4%)</td>
<td>327 (90.6%)</td>
</tr>
</tbody>
</table>

4.5 Preparedness measures put in place in KNH to prepare for disaster

Table 4.7 shows that there exists a policy on disaster management 234 (64.8%). Majority of the respondents indicated that there was no adequate fire fighting equipment 225 (62.3%); evacuation plans 236 (65.3%); early warning system 211 (58.4%); adequate assembly points 234 (64.8%); fire exits 198 (54.8%).

Table 4.7: Measures put in place in KNH to prepare for disaster

<table>
<thead>
<tr>
<th>Preparedness</th>
<th>Agree</th>
<th>Not sure</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disaster Committee</td>
<td>201(55.7%)</td>
<td>63(17.5%)</td>
<td>97(26.8%)</td>
</tr>
<tr>
<td>Policy on Disaster Management</td>
<td>234(64.8%)</td>
<td>44(12.2%)</td>
<td>83(23%)</td>
</tr>
<tr>
<td>Firefighting equipment</td>
<td>113(31.3%)</td>
<td>23(6.4%)</td>
<td>225(62.3%)</td>
</tr>
<tr>
<td>Evacuation plans</td>
<td>76(21.1%)</td>
<td>49(13.6%)</td>
<td>236(65.3%)</td>
</tr>
<tr>
<td>Early warning systems</td>
<td>101(28%)</td>
<td>49(13.6%)</td>
<td>211(58.4%)</td>
</tr>
<tr>
<td>Adequate Assembly points</td>
<td>83(23%)</td>
<td>44(12.2%)</td>
<td>234(64.8%)</td>
</tr>
<tr>
<td>Fire exits</td>
<td>114(31.6%)</td>
<td>49(13.6%)</td>
<td>198(54.8%)</td>
</tr>
<tr>
<td>Training on Disaster management</td>
<td>213(59%)</td>
<td>56(15.5%)</td>
<td>92(25.5%)</td>
</tr>
</tbody>
</table>
Majority of the respondents 343 (95%) were not members of the committee while 18 (5%) were members (figure 4.5).

**Figure 4.5: Membership to disaster management committee of the respondents**

4.5.1 Proportion of respondents who have previously participated in emergencies.

From the results, more than half of the members of staff 202 (56%) had participated in previous emergencies at the hospital.

**Figure 4.6 previous participation in emergencies**
Table 4.8 indicates most of the respondents (47%) had played a role of nursing in previous participation in emergencies while 2.5% played a role of radiography.

**Table 4.8: The roles played during participation/assistance due to emergency**

<table>
<thead>
<tr>
<th>Role</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dispensing medicines</td>
<td>14(6.9)</td>
</tr>
<tr>
<td>Registration and admission of patients</td>
<td>78(38.6)</td>
</tr>
<tr>
<td>Supply of emergency items</td>
<td>10(5.0)</td>
</tr>
<tr>
<td>Nursing</td>
<td>95(47.0)</td>
</tr>
<tr>
<td>Radiography</td>
<td>5(2.5)</td>
</tr>
</tbody>
</table>

Of the respondents who would be willing to come to work in case of emergencies arising due to disaster, 95 (29.7%) said it was professional calling and responsibility while 79 (24.5%) claimed it was about saving lives (Table 4.9).

**Table 4.9: Reasons for willing to participate during emergencies when not on duty**

<table>
<thead>
<tr>
<th>Reason (n=202 for each)</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal commitment to offer services</td>
<td>39</td>
<td>12.2</td>
</tr>
<tr>
<td>Helping injured people</td>
<td>42</td>
<td>13.1</td>
</tr>
<tr>
<td>Professional calling and responsibility</td>
<td>95</td>
<td>29.7</td>
</tr>
<tr>
<td>To save life</td>
<td>79</td>
<td>24.5</td>
</tr>
<tr>
<td>Humanitarian grounds and care</td>
<td>37</td>
<td>11.6</td>
</tr>
<tr>
<td>Logistical assistance</td>
<td>10</td>
<td>3.2</td>
</tr>
<tr>
<td>Disaster management</td>
<td>18</td>
<td>5.7</td>
</tr>
</tbody>
</table>
More than sixty percent of the respondents felt insufficient infrastructure (70.2%), shortage of staff (77%) and lack of emergency training and drills (69.2%) were major challenges to disaster preparedness. Lack of willingness by non-medical staff was not thought as a challenge by the respondents (42.9%). The challenge on limited trained staff (59.2%), poor coordination in times of disaster (57.9%) and poor community empowerment (59.3%) were not strongly agreed by the respondents. (Table 4.10)

**Table 4.10: Challenges influencing disaster management**

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Agree</th>
<th>Not sure</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insufficient infrastructure</td>
<td>253(70.2%)</td>
<td>36(9.9%)</td>
<td>72(19.9%)</td>
</tr>
<tr>
<td>Shortage of staff</td>
<td>278(77.0%)</td>
<td>22(6.1%)</td>
<td>61(16.9%)</td>
</tr>
<tr>
<td>Lack of willingness by non-medical staff</td>
<td>136(37.7%)</td>
<td>70(19.4%)</td>
<td>155(42.9%)</td>
</tr>
<tr>
<td>Poor coordination in times of disaster</td>
<td>209(57.9%)</td>
<td>31(8.6%)</td>
<td>121(33.5%)</td>
</tr>
<tr>
<td>Limited trained staff</td>
<td>213(59.2%)</td>
<td>30(8.3%)</td>
<td>118(32.5%)</td>
</tr>
<tr>
<td>Lack of emergency training and drills</td>
<td>250(69.2%)</td>
<td>34(9.4%)</td>
<td>77(21.4%)</td>
</tr>
</tbody>
</table>
Figure 4.7: Possible remedies to challenges facing KNH in disaster management

Majority of the respondents 333 (92.2%) indicated that increasing the number of medical staff was a remedy to challenges facing hospitals in disaster management followed by training all members of staff on disaster management 331 (91.8%). (figure 4.7)

![Graph showing possible remedies to challenges facing KNH in disaster management]
The study result in figure 4.8 indicates that majority of the respondents 310 (87%) have never been involved in development or revision of the hospital’s disaster management plan while 51 (13%) indicating that they have been involved in development and revision of the hospital’s disaster management plan.

**Figure 4.8: Participation in the development or revision of the KNH’s disaster management plan**
CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The chapter discusses and gives a summary of the research findings as carried out, conclusions based on the findings of the study and at end of the chapter, some useful recommendations are suggested by the researcher for the people under study and stakeholders in order to resolve the problem observed, based on the results.

5.2. Social demographic characteristics

The study findings indicated that most of the members of staff at the Kenyatta National hospital are aged between 30-40 years thereby indicating that the staff members are young and energetic to deal with cases of emergencies resulting from disasters. The study findings indicate that most of the members of staff at the Kenyatta National Hospital have worked for quite a long time in the facility and therefore are well versed with the operations of the facility and the preparedness for disasters. These findings went in line with the findings of the study conducted by APHA (2010) which conclude that, hospital staffs need to be prepared for an unusual increase in workload which calls for hospital disaster preparedness. The study findings indicate that most of the members of staff have attained tertiary education. This shows that the members of staff at Kenyatta National Hospital have the requisite education to be trained on such important issues like the disaster management.

Understanding a dimension of preparedness was found to be associated with work experience. This concurs with a research carried out in the Caribbean on vulnerability of hospitals to disasters which shows that there is an association between preparedness and
work experience (PAHO, 2000). A number of researches also show this association, (Drabek, 2005); (Peek, 2006). Work experience within the risk environment leads to Prediction of responses. Prediction is part of mitigation.

The study revealed that those who are at tertiary are fairly prepared for the management and preparedness of disaster at the hospital. Also, the study found out that there exists a relationship between the level of education attained by the staff, the age of the staff, work experience in years and the knowledge on disaster management. These findings confirmed the findings of Peek (2006) which indicated that investments in improving administration and strengthening the resource-base of public institutions will have a general positive impact on the effectiveness of preparedness arrangements, emergency responses and the quality of longer-term recovery planning. Training programmes in general, and especially those with a management or technical focus, can be expected to improve the implementation of mitigation and response measures. The study further established that there was no relationship found between the gender and the knowledge on disaster management. These findings went contrary to the findings of the study done by Ginter (2006) which indicated that, Gender issues are important and must be included in all plans of the disaster management cycle to make it more effective and efficient. Ginter (2006) argued from the illustration that; the inclusion of women in the formulation of plans may result in more relevant and speedier delivery of relief responses to affected children given their natural proximity to them.
### 5.2.1 Potential disasters at Kenyatta National Hospital.

Findings of the study suggested that KNH will be subject less to natural disasters because Kenya has no history of natural disasters. The recent earthquake in Haiti, Chile, and Japan in February 2010 showed that the loss of critical health services such as emergency rooms, intensive care unit, operating rooms and diagnostic services, among others, had to be covered by nearby hospitals. Services provided by damaged hospitals had to be established making use of almost any available building or of tents (PAHO, 2012). In the Latin America and the Caribbean, 61% of the damage caused to hospitals is by earthquakes, 17% are hurricanes, 14% are floods, and 8% are other natural disasters (RDIC, 2000).

Hospitals are unsafe environments as cross infections between patients and even staff could occur. Polypathological and nasocomial infections are real threats in hospitals. This is explained by the high number of respondents (71.8%) who indicated disease epidemics as a potential threat. This agrees with a study carried out in the Carribeans after Hurricane Katrina and the flooding of New Orleans and other areas of the Gulf Coast (Drabek, 2005).

Chemical spill was considered a potential threat with 60.7% of the respondents. This is in agreement to an safety and audit report carried out at KNH in 2012 (KNH, 2012). The materials normally stored at the Hospital are many and in different locations including office stationery, machine spare parts and consumables, personal protective equipment, process chemicals, ewaste, clinical waste, body parts, raw materials and finished products. Some of the materials are hazardous and hence require careful handling to
avoid unsafe and unhealthy situations (KNH, 2012). Hospitals use a lot of chemicals in the course of treatment and offering services. These chemicals include reagents used in the laboratiries, chemicals used in the radiology department in the processing of radiographs, and other chemicals used in the manufacture of drugs and special preparations.

Fire was also indicated as a potential threat with 80.6% of the respondents perceiving fire as a potential threat. Kenyatta National Hospital has suffered fire outbreaks in the past. Most of these incidences are small fires in the kitchen and one occurred in a ward. A fire in the hospital’s cardiology department led to the closure of the department for over a year in 2011. This is in agreement to a Statutory Safety and Health Audit carried out at Kenyatta National Hospital in August 2012 indicated that KNH does not have sufficient fire fighting equipments (KNH, 2012).

The possibility of a terrorist attack was very high (83.7%). This could be explained by the Westgate terrorist attack of September 2013 in Nairobi. The study was ongoing during that time. This may also be explained by the proximity of KNH to Westgate. The event may have had an influence on the study. KNH has also a high number of clients and visitors and screening them as they enter its premises is not done. Hence many respondents perceived terrorist attack as a major threat.

Food poisoning was considered a potential threat by 68.4% of the respondents. This is in agreement to a study carried out in KNH and published in the African Journal of Food Science and Technology (Gathura, 2013).
5.2.2 Knowledge and training on disaster preparedness at Kenyatta National Hospital.

The study revealed that members of the hospital staff were aware of a disaster management plan as reported by 66.7%, and had disaster management committee in place. Majority indicated they were not aware of the hospital having regular emergency drills (43.5%). A third of the respondents had no idea of the contents of disaster management Plan. This is in agreement to a study done by Coppola that found out that emergency communicators must make effort to correct perceptions through communication, and in turn, influence behavior that more appropriately addresses individuals’, communities’, and entire countries’ hazard profiles (Christopher, 2007).

Inaccurate perception of risk is something that affects all people and all cultures, regardless of education, background, or income, among other factors. People perceive risks as being either too great or too small. Majority (58%) of the respondents has never had any training on disaster management. This is contrary to the Occupational Safety and Health Act (OSHA) 2007, and Legal Notice No. 31: The Factories and Other Places of Work (Safety and Health Committee) Rules, 2004 which advocates for training on safety in work places. The Hospital conducts several internal occupational safety, health and environmental training at their training facility within the hospital, which include the following among others. Fire safety training, OSHE training, First Aid Training, HIV & AIDS, Infection control (KNH 2012). Gender was found not to have any influence on perception of disaster preparedness whilst age was found to have an influence with those aged above 50 having a good knowledge and training on disaster preparedness. This could be due to work experience which was found to influence knowledge and training.
This concurs with a research carried out in the Caribbean on vulnerability of hospitals to disasters which shows that there is an association between knowledge and training and work experience (PAHO, 2000).

5.2.3 Kenyatta National Hospital state of disaster preparedness

Network organizational structures within an institution in regards to disaster management explain the preparedness of the institution to handle cases of emergencies. The study findings reveal that there is presence of disaster management plan at the Kenyatta National Hospital thereby confirming to the idea of ISDR (2007) in which it is indicated that such plans have Disaster Risk Reduction measures in place, to reduce the impact of disasters. This is because disasters cause diversion of resources needed by developing countries to escape poverty. However, the study findings have indicated that some of the staff members of Kenyatta National Hospital are not familiar with the contents of the disaster management plan and therefore this compromises the preparedness of the hospital to the disasters that may rock it. The study finding has established that there exists a disaster management committee though most of the employees of Kenyatta National hospital are not members of that committee.

Investments in improving administration and strengthening the resource-base of public institutions will have a general positive impact on the effectiveness of preparedness arrangements, emergency responses and the quality of longer-term recovery planning. The study finding has established supportive results to the argument of Warfield that, work experience on disaster management is critical in the disaster preparedness among the employees of Kenyatta National hospital. The study has established that the
employees with longer work experience at the Kenyatta National hospital are more prepared to tackle disasters than those who have a smaller work experience. This explains that work experience is directly related to the disaster preparedness. The experienced employees are better prepared to tackle disasters and improve the efficiency in the management of disasters. Warfield also adds that, training programmes in general, and especially those with a management or technical focus, can be expected to improve the implementation of mitigation and response measures.

The study has also revealed that there is insufficient infrastructure at the Kenyatta National hospital to handle emergencies. The study has indicated that there is insufficient fire fighting equipment. Evacuation plans were also found to be inadequate. There was no early warning system in place. Assembly points and fire exits were also inadequate. This agrees with a Statutory Safety and Health Audit carried out at Kenyatta National Hospital in August 2012. During the audit, it was noted that both the fire Hose Reels and Hydrant system were out of order and no alternative was in place (KNH, 2012).
5.3 Conclusion

Well laid out disaster preparedness in institutions providing healthcare is a lee way to efficient health services delivery to the people. Kenyatta National hospital has various departments dealing with various ailments and complications. Disaster management committee is crucial in mitigating emergencies in hospital.

This study has identified potential threats in Kenyatta National Hospital. Highest on this list of potential threats is terrorist attack, followed by fire. The study found out that adequate measures have not been put in place to prepare and forestall these potential threats.

The study has established that Kenyatta National Hospitals have a disaster committee in place but not many of the members of staff are members and therefore compromises the preparedness to disasters.

The presence of disaster management plan is crucial in mitigating disaster at it gives to the implementers who are the staff members the laid out protocols and management techniques required in times of disaster. The plans exist at the Kenyatta National hospital though most of the staff members are not aware. The hospital therefore has the responsibility to ensure that all the members of the staff are familiar with the disaster contents of the disaster management plan and trainings are given for the management of disasters in the hospital.

The study established that KNH has no adequate infrastructure to handle the emergencies occurring in the hospital.

The factors that inhibit the adequate preparation for disasters at the Kenyatta National Hospital as found in this study include insufficient infrastructure to handle the cases of
emergencies, shortage of staff, poor coordination when disasters strike the hospitals and lack of emergency trainings and drills. Most of the staff members thus have not been trained on disaster management and mitigation. The study has established that the hospital need to adequately look into the up-gradation of the infrastructure to enhance the efficiency of service delivery in times of disaster as well as performing emergency trainings and drills. Disaster preparedness helps in curbing the high cases of emergencies resulting from disasters that occur in the country. The quality of disaster preparedness thus facilitates the delivery of healthcare services.
5.4 Recommendations

The recommendations will help the management of KNH to put in place the appropriate measures to prepare for disasters and also to mitigate any disasters.

Based on the findings the hospital management should have a well established and an all inclusive disaster management committee to adequately develop and revise the disaster management plan to curb the emergencies cases that occur due to disaster. This will ensure that the hospital is adequately prepared to handle all cases of emergencies without being overwhelmed.

The hospital should find a way of securing its premises from terrorist attack. This could include screening visitors entering the hospital’s premises including frisking them and installing metal detectors. This would go a long way in enhancing security.

The Kenyatta National hospital and the hospital stakeholders should improve on training of the staff both the medical staff and the non medical staff to enhance its preparedness to deal with emergencies resulting from disasters. This will ensure that all the staff members handle the casualties effectively and efficiently.

The Kenyatta National Hospital and the government should put in place the necessary infrastructure that include protective equipments for the nurses and the medical staffs to receive, care and nurse the casualties of disasters with ease and professionally. Lack of equipments or insufficient equipments compromise the service delivery to the casualties that may result to further injuries to the victims.
5.5 Further research

Further research need to be done on the effect of shortage of staff on the disaster management at Kenyatta National hospital to give recommendations on how shortage of staff should be improved to enhance their efficiency on service delivery.

There should be a study done on the effects of disasters on the available infrastructure at the Kenyatta National hospital and other hospitals across the country to give recommendations on how the available infrastructure can be put on efficient use.

A study should also be carried out to assess the state of preparedness for KNH to handle mass casualties brought to the hospital arising from disasters occurring out of the hospital. This study looked at mitigation and preparedness in handling disasters occurring within the hospital.
REFERENCES


RDIC. (2012). Safe Hospitals: A shared responsibility, a goal we can reach. [CRID/PAHO](#). Costa Rica


APPENDICES

Appendix I: Kenyatta National Hospital Map

Source: Google Maps
Appendix 2: Kenyatta National Hospital Photo

SOURCE: Kenyatta National Hospital, 2013
Appendix 3: Questionnaire

SECTION A: SOCIO-DEMOGRAPHIC, TRAINING AND WORK EXPERIENCE

Gender

 Male □ Female □

1. Age
   Below 20 □
   20-30 □
   31-40 □
   41-50 □
   Above 50 □

2. Duty station
   Casualty □ wards □ ICU □
   Theatre □ pharmacy □ laboratory □
   Administration □ outpatient □
   Other (specify) __________________________

3. Current position
   Medical officer □ nurse □ pharmacist □
   Laboratory □ other (specify) __________________

Please indicate your job group
   K17 – K11 □ K10 – K5 □ K4 – K1 □

4. Number of years in Kenyatta National Hospital
   Less than 1 year □ 1-5 years □ 5-10 years □
   10-15 years □ 15-20 years □ more than 20 □

5. Highest level of education completed
   None □ primary □ secondary □
   Certificate □ diploma □ undergraduate □
   Postgraduate □

6. Are you a member of the disaster management committee? YES □ NO □
SECTION B: POTENTIAL DISASTERS IN HOSPITALS

7. On a scale of 1-5, where 1-very much disagree, 2-disagree, 3-not sure, 4-agree, 5-very much agree state the extent to which you agree with the following as potential disasters that are likely to occur in the hospital

<table>
<thead>
<tr>
<th>Description</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Natural disasters (earthquakes, volcanoes etc.)</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>2. Disease epidemics</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>3. Terrorism Attacks</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>4. Chemical spills</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>5. Fires</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>6. Food poisoning</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>
SECTION C: KNOWLEDGE AND RISK PERCEPTION

8. On a scale of 1-5, where 1-very much disagree, 2-disagree, 3-not sure, 4-agree, 5-very much agree state the extent to which you agree with the following as challenges that hospitals face in disaster management.

<table>
<thead>
<tr>
<th>Description</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Insufficient infrastructure</td>
<td></td>
</tr>
<tr>
<td>2. Shortage of staff</td>
<td></td>
</tr>
<tr>
<td>3. Lack of willingness by non-medical staff and staff who are off-duty to assist</td>
<td></td>
</tr>
<tr>
<td>4. Unpredictable nature of disasters</td>
<td></td>
</tr>
<tr>
<td>5. Shortage of blood in blood banks for transfusion</td>
<td></td>
</tr>
<tr>
<td>6. Poor coordination when disasters strike</td>
<td></td>
</tr>
<tr>
<td>7. Limited number of trained and dedicated members of staff</td>
<td></td>
</tr>
<tr>
<td>8. Poor community empowerment and participation</td>
<td></td>
</tr>
<tr>
<td>9. Lack of emergency training and drills</td>
<td></td>
</tr>
</tbody>
</table>

9. Have you received any training on disaster management? YES ☐ NO ☐

10. How would you rate your knowledge regarding disaster management?
    Excellent ☐ Good ☐ Fair ☐ Poor ☐
11. On a scale of 1-5, where 1-very much disagree, 2-disagree, 3-not sure, 4-agree, 5-very much agree state the extent to which you agree with the following as possible remedies to challenges that hospitals face in disaster management.

<table>
<thead>
<tr>
<th>Description</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1   Up gradation of hospital infrastructure</td>
<td></td>
</tr>
<tr>
<td>2   Increase number of medical staff</td>
<td></td>
</tr>
<tr>
<td>3   Asking for support from other hospitals during times of disasters</td>
<td></td>
</tr>
<tr>
<td>4   Training all members of staff on disaster management</td>
<td></td>
</tr>
<tr>
<td>5   Performing regular emergency drills</td>
<td></td>
</tr>
<tr>
<td>6   Improve on coordination at times of disaster</td>
<td></td>
</tr>
</tbody>
</table>

12. Have you ever been involved in developing or revising the hospitals disaster management plan? YES □ NO □
SECTION D: KNH STATE OF PREPAREDNESS TO HANDLE DISASTERS

On a scale of 1-5, where 1-very much disagree, 2-disagree, 3-not sure, 4-agree, 5-very much agree state the extent to which you agree with the following as signs of a hospital’s preparedness for disasters

<table>
<thead>
<tr>
<th>Description</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Presence of hospital’s disaster management plan</td>
<td></td>
</tr>
<tr>
<td>2 Existence of a disaster management committee</td>
<td></td>
</tr>
<tr>
<td>3 Familiarity of the contents of the disaster management plan by all staff members</td>
<td></td>
</tr>
<tr>
<td>4 Emergency/disaster management training for all staff members</td>
<td></td>
</tr>
<tr>
<td>5 Existence of equipment in disaster preparedness (fire fighting, EWS, smoke detectors)</td>
<td></td>
</tr>
<tr>
<td>6 Adequate evacuation plan and exits</td>
<td></td>
</tr>
<tr>
<td>7 Regular emergency drills</td>
<td></td>
</tr>
<tr>
<td>8 Availability of personal protective equipment in case of an infectious disease outbreak</td>
<td></td>
</tr>
</tbody>
</table>

13. Have you ever participated or helped during an emergency? YES □ NO □
What role did you play?

........................................................................................................................................
........................................................................................................................................

14. If you were not on duty and were asked to come to work because the hospital has had a large number of casualties to take care of as a result of a disaster, would you be willing to do so?  YES  □  NO  □

Why?
........................................................................................................................................
........................................................................................................................................

Thank you for your responses
Appendix 4: Informed Consent

My name is Josephat Gachoka Kiongo. I am a Masters of Health Management student from Kenyatta University. I am conducting a study on “Disaster Mitigation and Preparedness among Members of Staff at Kenyatta National Hospital, Nairobi County in Kenya”. The information will be used by Kenyatta National Hospital to improve the quality of disaster mitigation and preparedness at the hospital. Findings of the study can also be employed in other facilities to improve the management of disaster mitigation and preparedness.

Participation in this study will require that I ask you some questions. I will record the information from you in a questionnaire.

You have the right to refuse participation in this study. You will not be discriminated against in any way as an employee of this hospital for your refusal to participate in this study.

Please remember that participation in this study is voluntary. You may ask questions related to this study at any time.

You may refuse to respond to any questions and you may stop an interview at any time.

Some of the questions you will be asked are on personal issues and may make you uncomfortable. If this happens, you may refuse to answer these questions if you so choose. The interview may take approximately half an hour of your time.

If you participate in this study you will help improve the management of disaster mitigation and preparedness at Kenyatta National Hospital and elsewhere.

There will be no financial rewards or other benefits for participating in this study.
Interviews will be conducted in private setting within the hospital. Your name will not be recorded on the questionnaire. The questionnaires will kept in a locked cabinet for safe keeping at Kenyatta Hospital. Every piece of information gathered in this study will be kept private.

If you have any questions you may contact Dr. Andre Yitambe on 0715720568 or Dr. Justus. O.S. Osero on 0724869330 or the Kenyatta University and Ethical Research.

The above information regarding my participation in the study is clear to me. I have been given a chance to ask questions and my questions have been answered to my satisfaction. My participation in this study is entirely voluntary. I understand the information I give will be kept private and I can leave the study at any time. I understand I will not be discriminated against as an employee of Kenyatta National Hospital by my refusal to participate in this study.

Name of participant..................................................................................................................................................
..........................................................................................................................................................................
Signature or Thumbprint                     Date

I the undersigned have explained to the participant/volunteer in a language s/he understands the procedures to be followed in the study and the risks and the benefits involved.

Name of Interview .................................................. ............................................................................................
..........................................................................................................................................................................
Interviewer Signature                     Date
Appendix 5: Kenyatta University Ethical Approval

KENYATTA UNIVERSITY  
ETHICS REVIEW COMMITTEE  

Fax: 8711242/8711575  
Email: kuerc.chairman@ku.ac.ke  
kuerc.secretary@ku.ac.ke  
Website: www.ku.ac.ke  

Our Ref: K/U/R/COMM/31/244  

P. O. Box 43844  
Nairobi, 00100  
Tel: 8710901/12  
Tel: 8710901/12  

Date: 23rd October, 2013  

Josephat Gachoka Kiongo  
Kenyatta University  
P.O. Box 43844 - 00100 Nairobi  

Dear Mr. Kiongo,  

APPLICATION NUMBER PKU/153/1 134 – “DISASTER MITIGATION AND PREPAREDNESS AMONG MEMBERS OF STAFF AT KENYATTA NATIONAL HOSPITAL, NAIROBI COUNTY, KENYA” – Version 2

1. IDENTIFICATION OF PROTOCOL

The application before the committee is with a research topic “Disaster mitigation and preparedness among members of staff at Kenyatta National Hospital, Nairobi County, Kenya” dated 23rd October, 2013.

2. APPLICANT

Josephat Gachoka Kiongo  
Kenyatta University  
P.O. Box 43844 - 00100 Nairobi  

3. SITE

Kenyatta National Hospital, Nairobi County, Kenya  

4. DECISION

The committee has considered the research protocol in accordance with the Kenyatta University Research Policy (section 7.2.1.3) and the Kenyatta University Ethics Review Committee Guidelines, and is of the view that against the following elements of review,

(i) Scientific design and conduct of study,  
(ii) Recruitment of research participant,  
(iii) Care and protection of research participants,  
(iv) Protection of research participant’s confidentiality,  
(v) Informed consent process,  
(vi) Community considerations.

AND APPROVED that the research may proceed for a period of ONE year from 23rd October, 2013.
ADVICE/CONDITIONS

i. Progress reports are submitted to the KU-ERC every six months and a full report is submitted at the end of the study.

ii. Serious and unexpected adverse events related to the conduct of the study are reported to this board immediately they occur.

iii. Notify the Kenyatta University Ethics Committee of any amendments to the protocol.

iv. Submit an electronic copy of the protocol to KUERC.

When replying, kindly quote the application number above.

If you accept the decision reached and advice and conditions given please sign in the space provided below and return to KU-ERC a copy of the letter.

[Signature]

PROF. NICHOLAS K. GIKONYO
CHAIRMAN ETHICS REVIEW COMMITTEE

I, [Name], accept the advice given and will fulfill the conditions therein.

Signature: [Signature]
Dated this day of [Date] 2013.

cc. Vice-Chancellor
Director: Institute for Research Science and Technology
Appendix 6: Nacosti Research Clearance Permit

THIS IS TO CERTIFY THAT:
MR. JOSEPHAT GACHOKA KIONGO
of KENYATTA UNIVERSITY, 19816-202
Nairobi, has been permitted to conduct research in Nairobi County
on the topic: DISASTER MITIGATION
AND PREPAREDNESS AMONG MEMBERS
OF STAFF AT KENYATTA NATIONAL
HOSPITAL, NAIROBI COUNTY IN KENYA

for the period ending:
30th September, 2014

Applicant's Signature

Secretary
National Commission for Science, Technology & Innovation

CONDITIONS

1. You must report to the County Commissioner and the County Education Officer of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit.
2. Government Officers will not be interviewed without prior appointment.
3. No questionnaire will be used unless it has been approved.
4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.
5. You are required to submit at least two (2) hard copies and one (1) soft copy of your final report.
6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice.

RESEARCH CLEARANCE
PERMIT

Serial No. A 601

CONDITIONS: see back page