

Community-based perceptions of emergency care in communities lacking formalised  
emergency medicine systems

by

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## **ABSTRACT**

### **Background**

Kenya and Zambia face an increasing burden of emergent disease, with a high incidence of communicable diseases, increasing prevalence of non-communicable diseases and traumatic injuries. However, neither country has an integrated emergency care system that provides community access to high-quality emergency services. There has been recent interest in strengthening the emergency care systems in these countries, but before any interventions are implemented, an assessment of the current need for emergency care must be conducted, as the burden of acute disease and barriers to accessing emergency care in Zambia and Kenya remain largely undocumented.

### **Aims and Objectives**

The aim of this project was to ascertain community-based perceptions of the critical interventions necessary to improve access to emergency care in Zambia and Kenya, with the following objectives:

1. Determine the current pattern of out-of-hospital emergency care delivery at the community level.
2. Identify the communities' experiences with emergency conditions and the barriers they face when trying to access care.
3. Discover community-generated solutions to the paucity of emergency care in urban and rural settings.

### **Methods**

Semi-structured focus groups were piloted in Zambia with 200 participants. Results were analysed with subsequent tool refinement for Kenya.

Data were collected via focus groups with 600 urban and rural community members in cities and rural villages in the 8 Kenyan provinces. Thematic analysis of community member focus groups identified frequency of emergencies, perceptions of emergency care, perceived barriers to emergency care, and ideas for potential interventions.

### **Results**

Analysis of the focus group data identified several common themes. Community members in Zambia and Kenya experience a wide range of medical emergencies, and they rely on family members, neighbours, and Good Samaritans for assistance.

These community members frequently provide assistance with transportation to medical facilities, and also attempt some basic first aid. These communities are already assisting one another during emergencies, and are willing to help in the future. Participants in this study also identified several barriers to emergency care: a lack of community education, absent or non-functional communication systems, insufficient transportation, no triage system, a lack of healthcare providers trained in emergency care, and inadequate equipment and supplies.

### **Conclusions**

Community members in Zambia and Kenya experience a wide range of medical emergencies. There is substantial reliance on family members and neighbours for assistance, commonly with transportation. Creating community education initiatives, identifying novel transportation solutions, implementing triage in healthcare facilities, and improving receiving facility care were community-identified solutions to barriers to emergency care.

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## **ACRONYMS AND ABBREVIATIONS**

<b>AFEM</b>	The African Federation for Emergency Medicine
<b>CPR</b>	Cardio-Pulmonary Resuscitation
<b>DALY</b>	Disability-Adjusted Life Year
<b>DCP</b>	Disease Control Priorities in developing countries
<b>EMS</b>	Emergency Medical Services
<b>IFEM</b>	The International Federation for Emergency Medicine
<b>KEPH</b>	Kenya Essential Package for Health
<b>LMIC</b>	Low- and Middle-Income Country
<b>MoH</b>	Ministry of Health
<b>MOPHS</b>	Ministry of Public Health and Sanitation
<b>NCD</b>	Non-Communicable Disease
<b>NGO</b>	Non-Governmental Organisation
<b>RTI</b>	Road Traffic Incident
<b>SOP</b>	Standard Operating Procedure
<b>WHO</b>	World Health Organisation
<b>ZDF</b>	Zambian Defence Force

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# CHAPTER 1

## Introduction

### 1.1 Background

There are many different definitions in the field of emergency care. The African Federation for Emergency Medicine (AFEM), for instance, defines 'acute care' as *"the provision of initial resuscitation, stabilisation, and treatment to acutely ill and injured patients, and delivery of those patients to the best available definitive care, regardless of their ability to pay."*(1) The term 'acute care' is meant to encompass a range of healthcare functions, including pre-hospital emergency care, facility-based emergency care, acute care surgery, urgent care, and short-term stabilisation.(2) In this way, acute care *"encompasses the health system components used to treat patients with urgent or emergent conditions,"* and includes, but is not limited to emergency care. (1)

'Emergency care' is used to refer to the time-sensitive clinical services that are focused on treating emergent health conditions that present sudden or unexpected threats to life or limb.(2) Occasionally, the term 'acute and emergency care' is used to refer to both areas, particularly in low- and middle- income countries (LMICs) where using a broader term like acute care may be more appropriate for a systems-based approach.(2)

The International Federation for Emergency Medicine (IFEM) defines the overall emergency care system as a *"system for delivering emergency care within a region; including systems for emergency care access (i.e. universal telephone number for medical emergencies, alarm and dispatch functions), pre-hospital ambulance-based care, hospital-based emergency department care and in-hospital definitive care."*(3)

And more specifically, IFEM defines 'emergency medicine' as *"a field of practice based on the knowledge and skills required for the prevention, diagnosis, and management of acute and urgent aspects of illness and injury affecting patients of all age groups with a full spectrum of episodic undifferentiated physical and behavioural disorders; it encompasses an understanding of the development of pre-hospital and in-hospital emergency medical systems and the skills necessary for this development."*(3)

Other important terminology includes 'out-of-hospital emergency care' and 'pre-hospital care', with out-of-hospital emergency care referring to any emergency care

that takes place outside of healthcare facilities (including care delivered by both laypersons and professional responders).(4,5) Pre-hospital emergency care refers to a subset of out-of-hospital emergency care, the portion of care that is provided by professional responders prior to arrival at the healthcare facility.(4,5)

In this dissertation, the terms 'emergency care' and 'emergency care system' will be used to refer to both pre-hospital and facility-based treatment of acute or emergent illness and injury. This is instead of using the broader term 'acute care', as we will not be discussing preventative services, acute care surgical services, or rehabilitation.

While those in high-income countries often talk about the speciality of emergency medicine, discussions in African countries typically centre on the more inclusive terms acute care or emergency care. Emergency medicine is a young specialty in sub-Saharan Africa, with many countries just beginning to develop emergency care systems. At the moment, emergency medicine is only recognised as a specialty in six countries: Botswana, Ethiopia, Ghana, South Africa, Sudan, and Tanzania. These are also the countries that have emergency medicine specialist training programs.(6–12)

But many other countries are taking a broader approach to developing their emergency care systems that does not currently include emergency medicine specialists. Ghana, Madagascar, and Mauritius are taking strides to develop their national ambulance service.(8,13,14) In Rwanda and Madagascar, diploma courses are offered to doctors.(15,16) Botswana and Ghana are focusing on medical students by incorporating emergency care into their curricula.(8,17) And in Ghana and Sudan, focus has been placed on training nurses in emergency care.(8,12)

There are still many sub-Saharan African countries that have not yet made emergency care a priority. But some countries such as Zambia and Kenya are beginning to take the first steps towards improving their emergency care systems by striving to understand the needs of their citizens. This dissertation will describe the current state of emergency care in Zambia and Kenya and the initial steps taken to identify the need for, and plan, interventions to improve their emergency care systems.

### **1.1.1 Zambia**

Zambia has a population of over 14 million people, 60% of whom live in rural areas. The under-five mortality rate per 1,000 births is 89, and the maternal mortality rate

per 100,000 live births is 280.(18) Historically, much emphasis has been placed on communicable diseases as a major cause of mortality, but morbidity and mortality due to non-communicable disease (NCD) are on the rise, with risk factors such as hypertension found in 41% of the adult male population.(18)

Zambia’s health sector is facing several challenges, including a critical shortage of human resources. Zambia has 0.7 physicians per 10,000 people, and 7.8 nurses and midwives per 10,000 people.(18) This is less than half of the human resources recommended by the World Health Organisation (WHO).(19,20) A “Human Resources for Health” report by the WHO states that the Zambian healthcare system is suffering from “inadequate [healthcare worker] training and education systems, inadequate conditions of service, poor health infrastructure and working environments, as well as ineffective human resource and low health service financing”, and states that this crisis is a major impediment to achieving the Millennium Development Goals.

Table 1. Zambian health workers per 1,000 people against international benchmarks

Cadre	Health workers per 1,000 people	Benchmark to achieve MDGs (per 1,000 people)
Doctor	0.0777	0.55 (Scheffler et al, 2008)
Nurse (registered and enrolled)	0.6905	1.73 (Scheffler et al, 2008)
Total	1.0458	2.28 (WHO/JLI) including doctors, nurses, and midwives only

Source: Herbst(20) from Herbst and Gijbrecchts 2007

Zambia has five levels of healthcare facilities. At the top are the “specialist” or “tertiary” hospitals, serving as the referral centre for catchment areas of over 800,000 people. These hospitals have sub-specialist services, and handle cases that other hospitals cannot. In 2012 there were 6 tertiary hospitals in Zambia. The next tier is the “provincial” or “general” hospitals, which serve catchment areas of 200,000 to 800,000 people. They provide specialist surgical, medical, paediatric, obstetric, and intensive care services. In 2012 there were 19 provincial hospitals in Zambia. District hospitals constitute the next tier, and serve populations between 80,000 and 200,000 people. They provide basic surgical, medical, and obstetric care. In 2012 there were

84 district hospitals in Zambia. The bottom two tiers are health centres and health posts. Health posts were created for communities located far from a health centre. In 2012 there were 409 urban health centres, 1,131 rural health centres, and 307 health posts in Zambia.(19,21,22) This equals a total of 1,956 health facilities in Zambia, of which 88% are Government owned, 13% are private, and 6% are faith-based.(21) The Government facilities are split between those operated by the Ministry of Health (MoH) and those operated by the Zambian Defence Force (ZDF). The ZDF network of hospitals and clinics serves both military personnel and their families as well as the surrounding civilian communities, and civilians comprise up to 80% of ZDF clinic patients.(23)

### **1.1.2 Status of Emergency Care in Zambia**

On February 7, 2013, a major road traffic accident occurred along the Zambian Great East Road, killing 58 people.(24) This accident prompted the Directorate of Mobile and Emergency Health Services of the Zambian MoH to hold a review meeting in March 2013 to study the response and create an action plan to improve emergency response in Zambia. Forty-five participants from 15 different organizations attended the meeting, including the Minister of Health Dr Joseph Kasonde.(24)

The meeting highlighted four key challenges facing the Zambian healthcare system: no emergency care infrastructure, a lack of a universal emergency number and central call centre, no provision of pre-hospital care, and a lack of resources and equipment.(25) Communication is a great challenge because there are too many emergency call numbers, and the public does not know which to call for a given emergency. Additionally, there is no central command centre to field calls and allocate resources. Pre-hospital care is non-existent, as there are few paramedics and first responders are not equipped with the necessary knowledge and skills to provide first aid. At the conclusion of this meeting, those present resolved to create a universal toll-free emergency number, train paramedics and provide first aid training for police officers, fire-fighters, drivers, and community members, establish trauma centres in major hospitals, and establish a trauma registry.(24,25)

At the moment, emergency care in Zambia is in its infancy. Emergency medicine is not recognised as a specialty, and there are no practicing emergency medical specialists in the country. Additionally, there are no current emergency medicine training programs endorsed by the government, either to train specialist physicians or

shorter programs for midlevel providers.(26) The MoH and the ZDF, however, are committed to improving emergency care in the country.

### **1.1.3 Kenya**

Kenya has a population of over 43 million people, 76% of whom live in rural areas. The under-five mortality rate per 1,000 births is 73, and the maternal mortality rate per 100,000 live births is 400.(27) Similar to Zambia, there is a shortage of healthcare providers in Kenya, with 1.8 physicians per 10,000 people and 7.9 nurses and midwives per 10,000 people.(27)

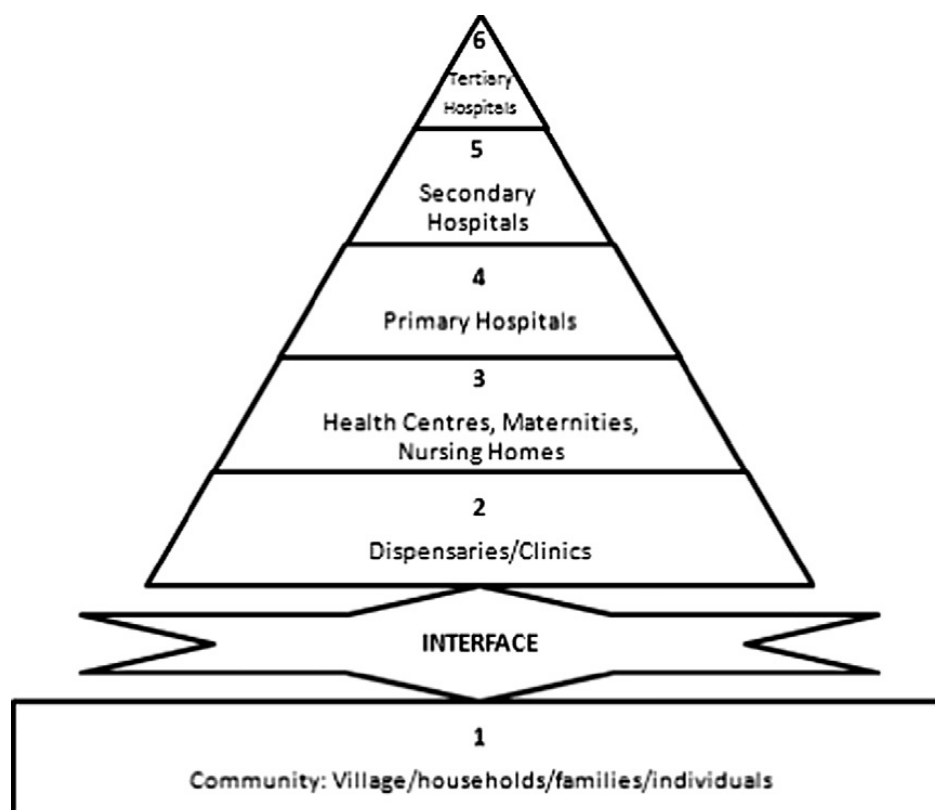
Kenya currently faces an increasing burden of acute disease, with both a high burden of communicable diseases and a steadily increasing burden of NCDs (cancer, diabetes and hypertension), mental illness, and road traffic injuries.(28) Malaria is the leading cause of morbidity, followed by respiratory diseases.(29) HIV/AIDS also plays a significant role in the country's morbidity and mortality. As all of these conditions can present with acute complications, the emergency workload in Kenya is likely to increase.(30)

Kenya is also significantly impacted by disasters and other major incidents. Kenya's major incidents profile is dominated by droughts, floods, fires, terrorism, collapsed buildings, transportation accidents, and epidemics.(31) As Kenya has no integrated emergency services and lacks resources for emergency care, many incidents escalate to such an extent that they become major incidents.(31,32) The recent natural and manmade disasters have resulted in a high number of deaths and injuries, which suggests that the country is still not adequately prepared to handle major incidents.(31)

There are 222 public primary hospitals, 10 public secondary hospitals, and three public tertiary hospitals in Kenya, and there are over 6,600 health facilities in the country as a whole.(30,33) The Kenya Essential Package for Health (KEPH) defines health services and interventions according to six tiers. At the bottom tier, the Kenyan Community Health Strategy focuses on services that are most effectively delivered at the community level, such as disease prevention.(34) Dispensaries and clinics make up the next tier, and are staffed by registered nurses providing basic outpatient services. Dispensaries and clinics make up 80% of the Kenyan healthcare system.(35) The third tier includes health centres, maternities, and nursing homes, which frequently have clinical officers on staff and can provide basic inpatient services. Primary hospitals are the first tier staffed by physicians, and are able to

provide twenty-four hour services and can provide more comprehensive surgical and inpatient care. Secondary and tertiary hospitals provide a variety of specialist services, including intensive care, and serve as clinical training sites. Tertiary hospitals receive referrals that cannot be managed at secondary hospitals, and in addition conduct research.(35) Approximately 51% of Kenyan healthcare facilities are government run, while the private sector, which includes both for-profit organisations and non-governmental organisations (NGOs), contributes to approximately 33% of outpatient care and 14% of inpatient care.(35)

Figure 1: KEPH levels of care



Source: Wachira and Martin(35) from MOPHS(28)

In 2008, the Ministry of Public Health and Sanitation (MOPHS) created a strategic plan for Kenya's healthcare priorities. One of the key challenges identified was a weak health information system.(36) The lack of a functioning health information system is attributed to several factors, including inadequate capacity and parallel data collection systems that are not integrated.(28) The Strategic Plan for Health Information Systems was developed to address this problem.(28)

#### **1.1.4 Status of Emergency Care in Kenya**

Several recent papers have highlighted the lack of emergency care services in Kenya(30,31,35), and all papers have all been authored by the only emergency medicine specialist in the country (who received his specialist training in South Africa).

Emergency Medicine is not recognised as a specialty by the Kenya Medical and Dentists Board, and there are no emergency medicine training programs in the medical schools.(30) Most Emergency Centres are staffed by clinical officers, who are healthcare providers with three years of intensive clinical medicine training. These clinical officers either work independently, or alongside medical officers. And both clinical officers and medical officers lack specific training in emergency medicine, although they provide most of the acute and emergency care in the country.(35)

Kenyan Emergency Centres provide fragmented emergency care, as patients are evaluated in different areas of the centre and by providers from different specialties depending on their complaint. Additionally, they are often poorly equipped and overcrowded.(35) There are systems in place to transfer patients to higher levels of care, and in 2004 the Service Provision Assessment report stated that in government healthcare facilities nine out of 10 primary hospitals, six out of 10 health centres, and few dispensaries had transportation available for emergency transfers. However, in more remote areas a lack of cellular network, poor roads, and lack of referral forms make life-saving transfers substantially more difficult.(35)

The only public provider of pre-hospital emergency care services in Kenya is St. John Ambulance, who operate 10 ambulances.(37) There are private ambulances in Nairobi, but these only serve patients who are able to pay. The majority of acutely ill and injured patients are transported to hospitals by car, truck, taxi, or other public transportation. Very few present to emergency centres via ambulance, as ambulances are scarce and the private services are not affordable for most.(35) The Kenya Council for Emergency Medical Technicians, established in 2008, is the professional body that trains Emergency Medical Technicians, regulates Emergency Medical Services (EMS) training in the country, and lobbies for formal recognition of Emergency Medical Technicians.(35)

In the Kenyan Health Sector Strategic and Investment Plan, reducing the burden of violence and injuries is listed as the third strategic objective. This objective focuses

predominantly on primary prevention of violence and injuries such as gender based violence and road traffic injuries, yet highlights interventions ranging from community health promotion and education to pre-hospital care and facility-based trauma care.(34) The fourth strategic objective is to “provide essential health services”, with one of the priorities focused on free access to trauma care, critical care, emergency care, and disaster care services.(34)

### **1.1.5 Integrating Acute and Emergency Care into Health Systems**

As highlighted above, there is a great need to improve the emergency care systems in Zambia and Kenya, a need that has been recognised by the ZDF, the Zambian MoH, and key stakeholders in Kenya.

Improving acute and emergency care systems is critical for overall health systems strengthening. The purpose of health systems is to “ensure the highest attainable standard of health for a community.”(2) The emphasis of health systems is on health improvement, and health is improved by effective, prioritised services such as timely response to acute illness and injury.(2,38,39)

In order to be effective, acute and emergency care systems must be linked with all other health system resources and services, as this ensures timely service. Delays in treating acute injury and illness such as sepsis result in increased morbidity and mortality.(40–42) Thus, emergency care must be integrated into existing health systems broadly across many distinct healthcare platforms. This horizontal integration strengthens health system capacity by encouraging comprehensive and inclusive care.(2)

Conversely, emergency care is also improved by a highly functional healthcare system. Acutely ill and injured patients need timely, coordinated care, including an effective referral network. Thus, strong health systems can improve survival from acute illness and injury.(2)

Yet there are several barriers to integrating acute and emergency care into the health systems of sub-Saharan African countries such as Zambia and Kenya. These barriers have been outlined by AFEM, as follows:(1)

- The burden of acute disease in sub-Saharan Africa is severely under-documented.
- Most healthcare facilities in the region lack integrated approach to triage, resuscitation, and stabilisation of acutely ill patients.

- There are limited resources for health care in Africa, including a critical shortage of trained healthcare personnel in all cadres.
- There is a lack of standardised regionally-appropriate clinical guidelines for acute care at the sub-district and community level.
- Essential components of acute and emergency care have not been established, and there is no consensus on how to define the success of initiatives.
- There is no current advocacy plan for placing acute care on the global health agenda.

Of particular relevance is the first point, that the burden of acute disease is under-documented. Before appropriate interventions can be designed for and implemented in a given country, the status of acute and emergency care in the region must be known. AFEM endorses that *“robust acute care system development must occur in the context of a national health system and according to national priorities”*, and that *“targeted need assessments should precede interventions.”*<sup>(1)</sup> In order to successfully integrate acute and emergency care into a country’s existing health system, national stakeholders must fully understand and support the need for emergency care; to do this, stakeholders need information on:

- The burden of acute disease in their country
- The current status of emergency care in their country
- Which identified areas of need should be prioritised for intervention

## **1.2 Motivation**

Lack of early healthcare intervention has resulted in profound consequences on Zambia’s public health system, leading to an emerging awareness of the need for emergency care services. The Zambian MoH and ZDF recognise this burden, and have expressed their desire to implement interventions that will strengthen the emergency care system. The initial motivation for this study came directly from the Zambian MoH and the ZDF after their emergency care review meeting in March 2013. They recognised that their country was facing an increasing burden of acute disease and trauma, and resolved to intervene in order to mitigate the loss of life.

Kenya is similarly facing an increasing burden of acute disease both from communicable and non-communicable causes.<sup>(28,35)</sup> And as in Zambia, the increasing number of major incidents and disasters is placing strain on a healthcare

system not equipped to deal with large numbers of critically ill and injured people.(31) Although several strategic plans reference the need for emergency care systems in Kenya, there has been little progress in actually implementing interventions.(34,43) Zambia and Kenya were chosen as sites for this study because of the substantial stakeholder buy-in in each country. This study relies on in-country partnerships, and leaders in the movement to develop emergency care in each country requested that this study be conducted.

Before implementing any interventions to improve emergency care systems, government officials need data detailing the current need for emergency care and the current status of emergency care in their country. At the moment, no comprehensive disease burden data exist for Zambia or Kenya, and there have been no comprehensive studies investigating how well the current health systems provide emergency care, or how well citizens are able to receive care during emergencies. Since a large part of the Zambian healthcare budget comes from non-governmental organisations and private funders, the focus of healthcare data collection and reporting is often based on the Millennium Development Goals and only highlights a selective distribution of disease burden.(22) In Kenya, a weak health information system has also resulted in a lack of data on the burden of acute disease.(28) In addition, there has been very little investigation into how community members themselves access and experience emergency medical care. There is a need for data to inform the decision on priority focus areas and support the development of emergency care, which may include emergency first aid response, triage, basic life support and transport to definitive care. Gathering this data serves as an entry point to improve access to care and further infrastructure development.

The goal of this study was to understand the unique emergency care needs within Zambian and Kenyan communities, and to use gathered information to make recommendations on ways to respond to these needs with interventions at several levels.

### **1.3 Aims and Objectives**

This study had two main aims:

- The first aim was to create a community based assessment tool that can be customised for any region looking to assess the emergency care needs of its citizens.

- The second aim was to identify the critical interventions necessary for the Zambian and Kenyan emergency care systems in Zambia and Kenya by gathering information about community members' current need for and barriers to care.

In order to achieve these aims, the objectives were:

1. Determine the current pattern of out-of-hospital emergency care delivery at the community level in Zambia and Kenya as experienced by members of the community.
2. Identify the communities' experiences with emergency conditions and the barriers they face when trying to access care.
3. Discover community generated solutions to improve emergency care in urban and rural settings.

#### **1.4 Summary**

Zambia and Kenya are facing an increasing burden of NCDs and traumatic injuries, combined with a large burden of communicable diseases. Many individuals suffer acute complications from these diseases for which they require timely, life-saving medical intervention. The lack of emergency care in Zambia and Kenya prohibits most patients from accessing care for acute illness and injury. Although both countries have recognised the need for integrating emergency care into their health systems, they have yet to make any interventions.

The aims and objectives of this study will be accomplished with the following chapters:

Chapter 2 is a literature review that discusses the importance of emergency care development, explores the current literature related to emergency care in Zambia and Kenya, details the importance of conducting needs assessments, reviews literature on the study of barriers to care, and introduces the topic of community first response.

Chapter 3 describes the methodology used to conduct this study, including rationale for the decision to use focus groups.

Chapter 4 details the findings from the study, organised by country, then by themes relating to community exposure to medical emergencies, assistance and willingness to help, barriers to emergency care, and community-identified solutions.

Chapter 5 is the discussion, which interprets the findings reported in Chapter 4 and links them to a wider context. It also includes the limitations of the study.

Chapter 6 is the conclusion, which incorporates both the researcher's own conclusions and the conclusions of organisations requesting the study. It also includes the researcher's recommendations and the subsequent steps being taken in each country.

## CHAPTER 2

### Literature Review

The need for integration of emergency care into existing healthcare systems has received an increasing amount of recognition in recent years.(2,44,45) NCDs such as cardiovascular diseases, diabetes mellitus, cancers, and chronic respiratory diseases are contributing to increased morbidity and mortality in sub-Saharan Africa, and traumatic injuries such as road traffic injuries (RTIs) are also on the rise.(46) This is in addition to the already large burden of communicable diseases on the region.

Globally, the Disease Control Priorities in Developing Countries (DCP) project by the World Bank estimated that implementing emergency care systems could address 45% of deaths and 36% of disability-adjusted life years (DALYs) in LMICs.(47,48) Resolution 60.22 from the 60<sup>th</sup> World Health Assembly acknowledged the need for global strengthening of emergency care provision to “ensure timely and effective delivery to those who need it in the context of overall health-care system”.(49) In order to accomplish this, the WHO recommended that countries:

- “assess comprehensively the pre-hospital and emergency-care context including, where necessary, identifying unmet needs”
- “ensure involvement of ministries of health in... review and strengthening of the provision of trauma and emergency care”
- “consider establishing formal and integrated trauma and emergency-care systems and to draw on informal systems and community resources in order to establish pre-hospital-care capacity in areas where formal, pre-hospital emergency medical-care systems are impractical”(49)

Others call for an integrated approach that recognises the crosscutting role of emergency care throughout the entire healthcare system. In the past, healthcare interventions have been “vertical”, disease-oriented programs that were not integrated into the system as a whole, and thus contributed to the provision of fragmented care.(2,46) But by improving the access of acutely ill and injured individuals to immediate, life-saving medical care, outcomes can be improved by integrating the delivery of different services and improving efficiency.(2)

On a regional level, several African countries have recognised the importance of prioritising emergency care in their national health systems. Botswana, Ethiopia, Ghana, South Africa, Sudan, and Tanzania have all recognised emergency medicine

as a distinct specialty, and have implemented emergency medicine specialist training programs.(6–8,11,12) Other countries such as Madagascar, Malawi, and Rwanda have shorter diploma courses in emergency medicine, and are working towards starting specialist training programs.(15) Several more countries are just beginning to establish diploma programs and short courses for physicians and nurses in emergency care.

Task-shifting has been identified as a potential intervention to remedy the lack of emergency care in some sub-Saharan African countries.(50) Task-shifting refers to the allocation of tasks in healthcare to the least costly healthcare provider capable of performing that task.(51) As there are simply not enough doctors to meet the emergency care needs of sub-Saharan Africa, focus must shift towards non-physician providers, who often outnumber physicians and cost less to train.(52) Some aspects of care may be amenable to provision by a non-physician provider, and educational programs must reflect this.(53) In Ethiopia, a graduate-level nursing program is training emergency care nurses over two years, and then deploying them throughout the country to serve as the front line of emergency care.(54) Similar emergency care nursing programs have been developed in Ghana and Sudan.(8,12) Zambia and Kenya are both in the beginning stages of this process; they have recognised the need to improve their emergency care systems, yet have not begun implementing interventions.

## **2.1 Emergency Care in Zambia**

Little has been written relating to acute and emergency care in Zambia. This is in contrast to Kenya, where there have been at least four studies specifically addressing acute and emergency care in the country. Therefore, we know more detail about the status of emergency care and the burden of acute disease in Kenyan than in Zambia.

There have been a few studies, however, that have attempted to address a portion of the burden of acute disease by documenting the epidemiology of trauma cases or burn cases presenting to individual facilities. One study looked at trauma patients presenting to the emergency centre at University Teaching Hospital in Lusaka. Over six months, 3498 patients were enrolled in the trauma registry; patients were primarily male (71.8%), young (median age 24 years), and most commonly had suffered falls (26.3%), road traffic accidents (25.6%) and assault (20.0%). Most arrived by private vehicle (51.8%) or public transport (37.1%).(55) Another study

conducted an injury surveillance pilot project in five countries including Zambia, with Lusaka University Hospital serving as the Zambian study site. Over the six month study period, 1352 patients presented to Lusaka University Hospital with RTI, and 1332 presented with interpersonal violence.(56) A third study looked at burn patients presenting to St Francis Hospital in the Eastern Province, and found 510 burn patients were hospitalised over a period of seven years.(57) These studies, however, are not representative of the burden of acute disease in Zambia as a whole. Lusaka is the capital city, and University Teaching Hospital serves as the primary academic referral hospital for the entire country. It is expected that there may be substantially different patterns of injury and illness, and of healthcare utilisation, in areas outside the capital. For instance, Seidenberg et al found that “despite the lack of robust transport services for injured patients and the absence of coordinated pre-hospital care, a large percentage of patients arrived at UTH within a few hours of their injury.” They found that almost two-thirds of injured patients presented to the hospital within 6 hours of their injuries, and 23% arrived within one hour.(55) Additionally, many individuals suffering from acute injury and illness may not present to healthcare facilities at all, and collecting data at healthcare facilities would miss this cohort.

A study on anaesthesiology in Zambia also investigated emergency care, as anaesthesiologists are involved in emergency care in many countries; the study found that anaesthesiologists played almost no role in emergency care in Zambia.(58)

One study looked at teaching a short course in trauma care to surgeons at the University Teaching Hospital in Lusaka. Participants were taught the Acute Trauma Care course, and the majority had not received any prior training in trauma or critical care. Participants demonstrated increased knowledge and confidence in trauma care after the course, but the assessment was given immediately after the course was over, and there was no long-term retention follow-up.(59)

Interestingly, one group of investigators recognised that there is a substantial burden of epilepsy in Zambia, and that there are also many misconceptions about epilepsy and seizures. As Zambian police officers are expected to deal with a wide range of emergencies, this study investigated how well police officers understand epilepsy, and how they would treat people with the condition. The investigators found that Zambian police officers should be taught basic facts about seizures, such as that seizures are not contagious. They also require further education about seizure management.(60)

More has been written on the topic of maternal mortality in Zambia, which is also relevant to emergency care as obstetrical complications are emergencies themselves and require immediate medical intervention. Several studies have looked at the availability of emergency obstetric care, investigating factors such as distance and transportation on access to care.(61–63) One project evaluated a community-based intervention designed to reduce barriers to obstetric care. They aimed to improve communities' understanding of maternal health, and access to obstetrical services. The intervention involved the entire community; men became emergency transport drivers, community leaders became community volunteers, and older women trained to recognise obstetric danger signs. The investigators found that the intervention was associated with significant improvements in women's knowledge of obstetric danger signs, as well as their understanding of when to seek care.(64)

## **2.2 Emergency Care in Kenya**

Although Kenya does not recognise emergency medicine as a specialty or train its own specialist physicians, there is one practicing emergency medicine specialist in Kenya. He received his training in South Africa, and returned to Nairobi to champion the advancement of emergency care in his country. He has written several publications outlining the current status of emergency care in Kenya, and arguing for an integrated emergency care system throughout the entire country.(30,31,35)

Another recent study on emergency care in Kenya investigated the emergency care capacity of hospitals, health centres, and dispensaries in Western Kenya. They used interviews with key informants to assess health care services, patients presenting for care, provider capabilities, equipment, supplies, and medications.(65)

The study reported the most frequent emergent and urgent conditions at health centres and dispensaries. No lower-level facilities and 30% of higher-level facilities reported having a defined, organised approach to trauma. Only 13% of lower-level facilities reported providing any sort of care to trauma patients before referring them to a higher-level facility, and only 27% provided any painkillers or oxygen to patients with a possible heart attack before referring.(65)

Although community members often present to health centres and dispensaries with acute illness and injury, the investigators found that these facilities were unable to respond to the essential needs of patients presenting with acute trauma, possible heart attack, diabetic emergency, or sepsis. Few facilities had any organised

approach in transferring a patient or notifying the receiving facility, and most transferred patients without basic assessments or interventions.(65)

Recent studies have investigated the burden of traumatic injury in Kenya, with six of the seven studies focused exclusively on RTIs, and one looking at trauma patients in general. One study was conducted at Kenyatta National Hospital in Nairobi, and was a prospective study conducted over three months in 1999.(66) Another, more recent study at Kenyatta National Hospital found 400 RTIs and 179 cases of interpersonal violence presented over a period of six months.(56) Additional prospective studies were conducted at Thika district hospital in Central Province over 3 months and Kijabe hospital over 6 months.(67,68) Other studies were retrospective chart reviews, either at one hospital (69) or from multiple hospitals throughout the country.(70) Another study used data on RTIs collected by the Kenya traffic police department over a period of 6 years.(71) The results of these studies on RTI and trauma epidemiology in Kenya will be described later, but there were some common themes in the results. The majority of RTI and trauma patients in these studies were male, with percentages ranging from 63.7 to 84.6. And most patients were young; reported statistics included 75% aged between 20 and 49 years and 81.2% between 15 and 49 years. Interestingly, some studies found that the majority of patients were pedestrians, while others found that they were vehicle passengers.

One study established a hospital-based trauma registry at 3 hospitals in Kenya. The hospitals were primary, secondary, and tertiary hospitals located in Rift Valley, Central, and Nairobi Provinces. The trauma registry form collected data on demographics, pre-hospital care, location where the injury occurred, mechanism of injury, initial patient assessment, injury information, patient treatment, disposition, and any complications during stay. The process of data collection and entry was integrated into patient flow at each site.(72) The data from this project has not been published yet.

### **2.3 Needs Assessments**

According to the WHO, a community health needs assessment describes the state of health of local people, enables the identification of the major risk factors and causes of ill health, and enables the identification of the actions needed to address these.(73) By applying this definition to emergency care, we can extrapolate that an emergency care needs assessment would:

- describe the burden of acute illness and injury in a community,

- identify the risk factors and preceding causes of acute illness and injury, and
- identify interventions to reduce morbidity and mortality due to acute illness and injury.

It is important to note that a needs assessment is not an end in itself, but is a process of gathering data, analysing the results, and using the information to plan interventions aimed at improving the healthcare system in question.(73) Healthcare needs assessments are conducted in order to gather the information necessary to affect a favourable change on the health of the population. As all healthcare resources are finite, needs assessments also aim to identify the areas where intervention would cause the most good for the general population.(74) A needs assessment requires governments, ministries, or other stakeholders looking to improve a healthcare system to work collaboratively with the community and its healthcare providers to plan and deliver the most effective care to those in greatest need, while ensuring that resources are allocated where they can provide the greatest benefit.(73)

In order to fully assess the emergency care needs, or any healthcare needs, of a community, both quantitative and qualitative data are required. Useful types of quantitative data include local disease epidemiology and basic demographic and geographical data about the community in question.(75) Quantitative, objective data about the distribution and capacity of local healthcare facilities are also important. Qualitative data should come from all stakeholders, including leaders, community members, and healthcare providers, encouraging shared ownership of resulting projects.(76) All of these components are important, as each provides different information about the health status of a community. For instance, there are several problems with trying to use only epidemiological data to understand the need for acute and emergency care in a region. As has been previously discussed, the burden of acute illness and injury in Africa is severely under documented, and it has proven difficult to collect this data.(1,44) And even if the data were available, by collecting the data from healthcare facilities you miss a large portion of individuals with acute illness and injury who never present to a healthcare facility for care. Additionally, there is no way of quantifying the reasons why individuals did not receive care, whether they did not seek care to begin with, or whether they met insurmountable barriers along the way.

Components of a full needs assessment:

Quantitative: Local disease epidemiology

Community demographic data

Geographical distribution data

Healthcare facility analysis

Qualitative: Community appraisal

Healthcare provider appraisal

Leadership/Government input

It is crucial to include the community when conducting a needs assessment. As John Wright put it, "In most developing countries, the evolution of health services has been dominated by Western models of health care. These have rarely taken into account how local people explain illness, seek advice, or use traditional healing methods. The emphasis has been on hospitals and curative care rather than on trying to address local health needs equitably and effectively."<sup>(75)</sup> Involving the community in a needs assessment allows for local input into the intervention design, and local buy-in and ownership of the resulting project. In this regard, community-based needs assessments are "a way of tackling a community's problems by using the energy and leadership of the people who live there."<sup>(77)</sup> The investigators facilitating community-based needs assessments are aiding and supporting a community's critical appraisal of their local healthcare system and needs, which also assists their understanding. This can be empowering for communities, and by encouraging local ownership of projects and maintaining partnership with the community, resulting interventions are more likely to be successful and sustainable.<sup>(75)</sup>

Currently, there is no publically accessible tool that is available for conducting an assessment of out-of-hospital and pre-hospital care needs in a community, particularly when there is no existing system.<sup>(78)</sup> Assessment instruments have been developed within specific subspecialty categories of emergency medicine such as trauma care, surgical care, emergency obstetric care, and pre-hospital care.

In 2004, the World Health Organization (WHO) released the Guidelines for Essential Trauma Care to address the increasing global burden of death and disability from injury.<sup>(79)</sup> These guidelines recommend essential trauma care services that every country should provide and specify the human and physical resources needed to provide the recommended services. To promote the implementation of these guidelines, two assessment tools were released: the Full Essential Trauma Care Checklists and the Brief Essential Trauma Care Checklist.<sup>(80)</sup> Both of these checklists include knowledge and skills necessary for trauma care in addition to

equipment and supplies, and they have been used in many African countries to assess trauma care facilities. The checklists are specific to trauma care, and do not cover the full spectrum of emergency presentations.(81–84)

The WHO Integrated Management for Emergency and Essential Surgical Care toolkit provides a more generalised approach to surgical care, as it was designed to reduce morbidity and mortality from surgically managed disease across a number of specialties (obstetrics/gynaecology, acute surgical care, and trauma care). The toolkit includes a questionnaire that assesses a given healthcare facility's surgical capacity and asks questions related to available interventions, equipment, infrastructure, and human resources.(85–87) The toolkit has been implemented in several African countries to report deficiencies in surgical care, but it does not assess emergency care capacity as a whole.(88–95)

The WHO's Monitoring Emergency Obstetric Care handbook takes a novel approach to facility assessment by utilising a systematic checklist based primarily on adequacy of services, oriented around signal functions.(96) Signal functions are key medical interventions that indicate a functional system; rather than assessing each individual component, signal functions represent the culmination of knowledge, interventions, and supplies. For example, administration of parenteral antibiotics implies the knowledge that the antibiotics are necessary; the skill to establish intravenous (IV) access; and the availability of IV tubing, catheters, and the medication. If one part of this process is absent, the function cannot be accomplished, signalling a deficiency in that system. In this way, signal functions limit the number of items that need to be assessed without losing rigor. This concept is particularly translatable to emergency care conditions, in which a symphony of events must occur to produce the desired function.(78)

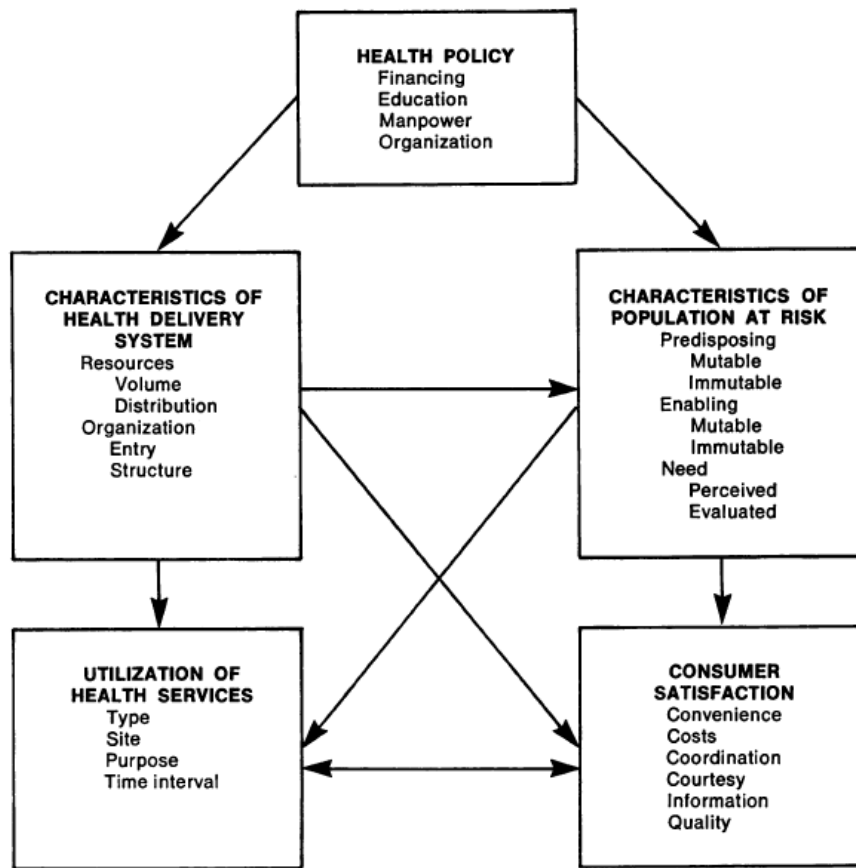
The WHO's Prehospital Trauma Care Systems document was developed to strengthen the quality and availability of pre-hospital trauma care systems. It identifies the basic necessary equipment and organisational structures that should serve as a foundation for an effective pre-hospital trauma care system. The emphasis, however, is on trauma care, and their checklist does not include the skills or equipment necessary for the treatment of medical or obstetrical emergencies.(97,98) Prehospital Trauma Care Systems does emphasise the importance of involving local community leaders and members in the design, development, and administration of a pre-hospital system, as this increases the likelihood that the community will accept, support, and sustain the system.(97)

In countries without existing emergency care systems, several recent studies have looked at the feasibility of implementing community first-responder training programs. These programs all conducted some form of a needs assessment before implementing their intervention. The assessments involved meetings and focus groups with local stakeholders in health services, analyses of available healthcare personnel and resources, and surveys and interviews of community members on their experiences with medical emergencies. Although the importance of a community and healthcare facility –based needs assessment is recognised, there is no existing tool that is available for adaptation and use in different settings. If such a tool did exist, it would facilitate the assessment and improvement of out-of-hospital and pre-hospital emergency care systems.

#### **2.4 Barriers to Access**

In order to discuss barriers to accessing medical care, one must first be familiar with the concept of access to care. One of the earliest frameworks for the study of access to care was devised by Aday and Andersen, and is often cited in the subsequent literature. In this model, health policy is envisioned as influencing the main inputs to care access, characteristics of the healthcare delivery system and characteristics of the population at risk. These inputs then affect the outputs or indicators of access, which are actual utilisation of healthcare services and consumer satisfaction.(99)

Figure 2: Framework for the study of access



Framework for the study of access.

Source: Aday and Andersen(99)

Characteristics of the healthcare delivery system may affect access to care due to a lack of sufficient resources for care or to an obstructive organisational structure that makes it difficult for patients to receive care. Characteristics of the population are equally important when considering access to care, as attributes of the individual and of their community are paramount in the decision of an individual to seek care at all, and if they do, whether they have the resources to arrive at and receive care. Characteristics of the healthcare system and of the individual both affect whether or not the individual wants to, and is able to, utilise healthcare services, and the experiences they have throughout this process influence their satisfaction. Satisfaction with the healthcare system and the care it provides then influences an individual's utilisation of the system in the future.

After understanding the individual components that influence access to care, it is necessary to identify indicators of access to care. Characteristics of the healthcare system and of the population may influence access to care, but true indicators must

ascertain whether healthcare services are actually utilised by those who need them.(99)

Thomas and Penchansky organised their approach to access to care into five dimensions of access:(100,101)

**Availability:** the relationship between the volume and type of existing services and resources and the needs of the community. Indicators include supply of healthcare providers and facilities.

**Accessibility:** the relationship between the location of services and the location of patients. Indicators include location of services, transportation resources of the community, and travel time, distance, and cost.

**Accommodation:** the relationship between the way in which the healthcare system is organised and how well the patients fit into this system. Indicators include satisfaction of community members with hours of operation and telephone services.

**Affordability:** the relationship between the price of healthcare, taking insurance and requirements of deposits into account, and the ability of individuals to pay. Indicators include cost of treatment, when payment is required, ability of individuals to pay, and the perceived worth of the services.

**Acceptability:** includes feelings of patients about their healthcare providers and feelings of healthcare providers about their patients. Indicators include patient satisfaction with their healthcare providers.

Jacobs et al created a framework for identifying and addressing barriers to healthcare access in low-income countries. They arranged their barriers into four of Thomas and Penchansky's five dimensions, and marked them as either "demand-side" or "supply-side". Demand-side barriers are those barriers at the individual or community level that affect an individual's ability to use health services. Supply-side barriers are those inherent to the health system that obstruct use by the community.(102)

Table 2: Barriers to accessing health services

Supply-side barriers	Demand-side barriers
<p><b>Geographic accessibility</b></p> <ul style="list-style-type: none"> <li>• Service location</li> </ul> <p><b>Availability</b></p> <ul style="list-style-type: none"> <li>• Unqualified health workers, staff absenteeism, opening hours</li> <li>• Waiting time</li> <li>• Motivation of staff</li> <li>• Drugs and other consumables</li> <li>• Non-integration of health services</li> <li>• Lack of opportunity (exclusion from services)</li> <li>• Late or no referral</li> </ul> <p><b>Affordability</b></p> <ul style="list-style-type: none"> <li>• Costs and prices of services, including informal payments</li> <li>• Private-public dual practices</li> </ul> <p><b>Acceptability</b></p> <ul style="list-style-type: none"> <li>• Complexity of billing system and inability for patients to know prices beforehand</li> <li>• Staff interpersonal skills, including trust</li> </ul>	<ul style="list-style-type: none"> <li>• Indirect costs to household (transport)</li> <li>• Means of transport available</li> </ul> <ul style="list-style-type: none"> <li>• Information on health care services/providers</li> <li>• Education</li> </ul> <ul style="list-style-type: none"> <li>• Household resources and willingness to pay</li> <li>• Opportunity costs</li> <li>• Cash flow within society</li> </ul> <ul style="list-style-type: none"> <li>• Households' expectations</li> <li>• Low self-esteem and little assertiveness</li> <li>• Community and cultural preferences</li> <li>• Stigma</li> <li>• Lack of health awareness</li> </ul>

Source: Jacobs et al (102)

This framework can be used to identify the most significant barriers to care in a given community, and to inform interventions designed to overcome these barriers.

## 2.5 Community First Response

There have been several recent studies investigating the feasibility of implementing community first-responder programs in countries without robust emergency care systems. The idea behind these programs is that in settings without a pre-hospital care system, community members can be trained to provide basic first aid immediately at the scene of an emergency, providing some initial stabilisation and assisting the patient to rapidly reach definitive care.

In order to improve the morbidity and mortality of individuals with acute illness and injury, community members must actually stop and provide assistance. This cannot be taken for granted, as several studies on bystander cardiopulmonary resuscitation (CPR) have shown that rates of bystander CPR rarely exceed 20%, even though it is strongly associated with increased survival.(103–105) In Vietnam, 48% of injury cases in one study received first aid at the site of the accident. Family members

provided first aid most often, followed by accompanying persons, passers-by, and community health workers.(106) In a study of fatal RTIs in Iran, 65% of first aid was provided by a layperson.(107) In Kenya, however, only 16% of interviewed RTI victims reported receiving first aid at the site of the accident.(70)

In Nigeria, a survey on the willingness of bystanders to assist in an emergency found that 73.4% of respondents would assist by calling EMS. When asked why they might not help a patient, 30.3% of respondents said they feared police harassment, 15.7% were afraid of contracting a disease, and 10.6% were afraid of not assisting correctly. Interestingly, the investigator found that while 58.5% of those surveyed that had previous first aid training had attempted to use their training to assist in an emergency, only 33.7% of those without training had ever attempted to help someone in distress. This finding was attributed to first aid training increasing confidence and making individuals feel more comfortable with helping.(108)

It is important to note that several studies have found that first aid training does increase confidence and the willingness of the individual to act when they encounter an emergency.(108,109)

Several community first responder programs have been initiated in Africa in countries such as Ghana, Madagascar, South Africa, and Uganda.(110–113) The majority of these programs train police officers and taxi, bus, and truck drivers, as they are most likely to come across accidents on the road. One program trained general laypersons in the community. In Ghana, a follow-up survey approximately 10 months after the initial training course showed that 48% of trainees had assisted at the scene of an RTI, and 26% had provided first aid care under other circumstances.(110) In Uganda, first aid knowledge testing before and immediately after the course saw scores increase from 45% to 86%.(113) And in South Africa, repeated testing immediately, 4 months, and 6 months post training showed a significant initial increase in first aid knowledge, with a decay in knowledge measured at 4 months but no further decay at 6 months.(114)

Another study found that trainees retained higher quality skills years after initial training when they were taught in a hands-on manner and were given periodic refresher courses.(115)

Several studies have shown that it is possible to teach community members basic first aid, and that they retain the knowledge both immediately after the course and further in the future. But it is more difficult to determine whether or not community first aid actually improves morbidity or mortality.

The theory behind these community first responder interventions is that some morbidity and mortality due to trauma can be prevented if basic first aid is provided on scene. Potential interventions that may reduce morbidity and mortality include maintaining an open airway, controlling bleeding, and preventing hypothermia.(116) Another benefit of community first aid may be the earlier access to definitive care, as community first responders can assist with finding transportation, or even provide transportation themselves if they have a vehicle.

Although several projects have demonstrated feasibility of the community first responder model, at this time there have been almost no studies that quantitatively measure the effectiveness of community first responders. Efficacy analysis is difficult in settings without a formal EMS system, as documentation of care and outcomes are often limited or non-existent, and there is no consensus on which indicators we should be assessing.(117,118)

Only one study has investigated the impact of community first responders on mortality. Investigators studying a rural trauma system in Iraq found a 5.8% decrease in mortality in patients initially managed by first responders.(119) The feasibility of this study was potentially aided by the significant proportion of patients who were managed at some point in the field by a trained paramedic.

## CHAPTER 3

### Methodology

#### 3.1 Focus Group Methodology

This study used a qualitative research methodology to explore community members' experiences with emergencies, and to ascertain community-based perceptions of the critical interventions necessary to improve access to emergency care in Zambia and Kenya.

There are many ways to define qualitative research, but perhaps the simplest is that *“qualitative research involves any research that uses data that do not indicate ordinal values.”*(120) Qualitative data are often in the form of text, images, or sound.(121)

Types of qualitative research include phenomenology, ethnography, case study, and grounded theory. This study uses the grounded theory approach, which involves identifying categories and concepts by systematically reviewing units of text, and linking them into theories that are grounded in the data.(121,122)

Focus groups were used to gather the qualitative data, as they are best for exploring beliefs, attitudes, and opinions.(121) Focus groups are discussions held with a group of people from similar backgrounds or experiences with the aim of discussing a specific topic(123); they are not simply interviews with multiple people, but rely on group discussion between participants, guided by one or more facilitators. If there are multiple facilitators, one may play the role of moderator while the other serves as the observer. The moderator guides the discussion of the group by using a focus group script to ask a standard set of questions to the group, and then allows the group to talk while making sure that the discussion does not become off-topic. If a second facilitator is present, they may serve as the focus group “observer”. The observer should watch the focus group participants and take notes on any factors that may influence the interpretation of the final session transcript. Although focus groups should be audio-recorded, the observer may catch non-verbal communication that would not be picked up by a Dictaphone.(123)

The flexible, open nature of qualitative methodology poses a great advantage over quantitative methods. Using qualitative methodology such as individual interviews and focus groups allows participants complete freedom when responding to questions.(121) While surveys require participants to select from a certain number of answers formulated by the investigator, interviews and focus groups allow participant

to provide answers that the investigator may not have initially thought of. Qualitative research also allows those who cannot read or write to participate, as the conversations are recorded and transcribed. This is especially important when you are looking for answers from populations that may have a significant proportion of illiterate people.

There are also several advantages specific to using a focus group approach. There are many variables that influence access to healthcare, and exploring barriers to care in a community can be complex. Focus groups are ideal for exploring complex topics where the goal is to understand what individuals in a community believe or feel, how they interact with a system, and why.(124) This methodology encourages participation, as participants may feel more comfortable voicing their opinions after they have heard others speak freely. Focus groups not only encourage group discussion, they also rely on it for optimal results. As participants begin discussing the topic with each other, they are given the opportunity to agree or disagree with what others are saying. This can provide investigators with an idea of how a whole group thinks about the issue at hand, and shed light on a wide range of opinions, shared experiences, and social norms.(123,125) Additionally, participants may be prompted to remember other pieces of information that they had forgotten. With focus groups, you can also gather information from a larger number of people more quickly than you could with individual interviews.(124)

There are some weaknesses to using qualitative methodology however. When using focus groups, participants may agree with other participants and get caught up in their line of thinking, such that the discussion becomes narrow and focused on one topic. Also, qualitative methodology is susceptible to unintentional interference by the moderator if they lead participants to answer questions in a certain way based on their interaction and prompting.(123)

The creation of categories is a core feature of qualitative data analysis.(126) A category is a group of content that shares a commonality and is often broken down into a number of sub-categories.(126) In this dissertation, as is consistent with the language of the qualitative coding software NVivo, the words 'sub-category' and 'node' are interchangeable. Themes in qualitative research are used as a way to link underlying meanings either within a category or between categories.(126) Coding is the process of raising data to a conceptual level, or as explained by Corbin and Strauss, "mining the data, digging beneath the surface to discover the hidden treasures contained within data."(127) Coding takes raw data and puts it into sub-categories or nodes.

The issue of language can be particularly challenging when conducting focus groups. When a researcher is investigating a population that speaks the same language, the researcher will often conduct the focus groups themselves. However, when the population does not speak the same language as the researcher, native speakers must be trained to facilitate the focus groups. Translation during focus groups is not a practical solution, as focus groups rely on natural flow of discussion between participants, and between the moderator and the participants. Having direct, real-time translation during a focus group would inhibit this flow.(123)

## **3.2 Focus Group Interviews, Zambia**

### **3.2.1 Design**

The study was initially conceptualised and designed as a collaboration between the investigators, the ZDF, and the Zambian MoH. The ZDF and the MoH wanted focus groups that captured both community members' and healthcare providers' opinions and ideas about emergency care. Thus, two separate focus group scripts were designed, one that targeted community members, and the other that targeted healthcare providers. The ZDF were particularly looking to explore the feasibility of implementing a community first responder program in Zambia, so questions specific to first aid provision were asked to community members.

The investigators then refined the focus group scripts, and a final draft was piloted in Zambia on three separate occasions before being introduced to the facilitator group during their training session, as described below, for final revision.

### **3.2.2 Focus Group Script**

The final focus group scripts for community members and healthcare providers can be found in Appendices 1 and 2. The community script began by ascertaining participants' understanding of what a medical emergency is. In these focus groups, the term 'medical emergency' was used to describe any life-threatening condition requiring emergency care, both traumatic and medical in nature. This was used to differentiate between a general 'emergency', which could be taken to include non-healthcare related events such as fires and building collapse. The script then had participants raise their hands if they had ever witnessed a medical emergency, or had witnessed more than 3 emergencies. The next portion of the script was a discussion about medical emergencies that participants had witnessed in the past. Facilitators were instructed to probe participants to determine the type of emergency

that had occurred, whether any assistance had been given on scene, how the patient was transported to the healthcare facility, and any challenges or difficulties that were encountered along the way. The next portion of the script asked participants whether they had previously, or if they would help someone who was suffering a medical emergency. The focus groups then explored why people may or may not feel inclined to help, and what might make someone more likely to help during an emergency. Finally, participants were asked where they sought care during a medical emergency.

The healthcare provider script asked providers questions about emergency care in their specific healthcare facilities, and in Zambia as a whole. The script began by asking providers how their facility would deal with patients who were suffering a medical emergency, and how medical documentation was performed at their facility. The script then asked specifically about the pathway a civilian and a military person would follow to reach their medical facility and access emergency care. Providers were then asked about any barriers that civilians or military personnel might encounter when trying to access emergency care at their facility. The next section asked providers how emergency care is delivered in Zambia as a whole, and asked them what they felt were the three major problems facing emergency care in Zambia. The providers were then asked how they felt the access of acutely ill and injured persons to emergency care could be improved, and what they would change about the way emergency care is provided in their country.

Open-ended questions about experience with emergencies and general barriers to care were asked before any probes were used, to avoid bias and to allow for emergence and exploration of new topics.

### **3.2.3 Facilitator Training**

Six Zambian healthcare providers were selected from a cohort of 20 providers who recently completed the first “fundamentals in emergency care” educational course. The fundamentals in emergency care course was taught by AFEM instructors over three weeks, and included education in the basics of emergency care as well as instruction on how to effectively educate others. Of the six providers who were chosen to facilitate the focus groups, three were members of the ZDF and three were members of the Zambian MoH.

The six Zambians were trained in January 2014 over two days to facilitate focus groups. They observed a focus group being performed by the investigators, and discussed each question in the focus group script to determine if it made sense for

their setting. The South African investigators then led the facilitators in roundtable discussions on prior experience with focus groups, language and translation, focus group planning and implementation, responsibilities of a moderator and observer, clarifying questions and probes, and consent and confidentiality. Each facilitator was then given a chance to practice conducting their own focus group, using the recording devices and consent process that would be used in the study. At the end of the training, a discussion was held on difficult situations that may be encountered during focus groups, and how to appropriately address them.

The Zambian facilitators were trained using a focus group guide that was adapted from the WHO and World Bank Manual for the Use of Focus Groups.(123)

After training, the Zambian facilitators were split into three groups of two each, with the idea that one would serve as the moderator for each focus group while the other served as the observer.

#### **3.2.4 Setting**

In January 2014 the facilitator groups travelled to three Zambian provinces; the urban Copperbelt Province, the rural Central Province, and the Eastern Province which is both urban and rural. These provinces were selected by the ZDF and the MoH due to increasing reports of emergencies.

The Copperbelt Province is the site of many of Zambia's copper mines. It has a population of almost 2 million people, and contains 3 of Zambia's 6 tertiary hospitals. It has 9 provincial hospitals and 8 district hospitals, 137 urban health centres and 53 rural health centres.(22)

The Central Province is located immediately south of Copperbelt and north of Lusaka. It has a population of 1.3 million people, and does not have any tertiary hospitals. It has 2 provincial hospitals and 7 district hospitals, and has 32 urban health centres and 113 rural health centres.(22)

The Eastern Province is located to the east of Lusaka and borders Malawi. It has a population of 1.6 million people, and does not have any tertiary hospitals. It has 2 provincial hospitals and 8 district hospitals, and has 8 urban health centres and 156 rural health centres.(22)

Three additional healthcare provider focus groups were conducted in Lusaka by the South African team. Two were conducted with the 20 healthcare providers who participated in the emergency care fundamentals course, and one was conducted at a military healthcare facility.

English is the official language of Zambia, but there are several recognised regional languages, and in rural communities it is highly likely that individuals might only speak their regional language. In the Copperbelt and Central Provinces, Bemba is the most common regional language, and in the Eastern Province it is Nyanja. This was taken into account when deciding which facilitators would go to which province. The facilitators were all fully fluent and comfortable with conducting the focus groups in both English and in either Bemba or Nyanja, depending on which province they were working in. The healthcare provider focus groups were conducted in English.

### **3.2.5 Population**

There were two targeted populations for inclusion in the Zambian focus groups, community members and healthcare providers. All community members aged 18 years and older were eligible for inclusion. Facilitators attempted to include participants of all ages and both genders in their groups. In addition, an effort was made to include a balance of military personnel from the ZDF, families of military personnel, and civilians.

Children under the age of 18 years and participants who refused to take part in the focus groups were excluded from the study.

### **3.2.6 Sampling Strategy**

The investigators worked with the facilitators to identify several sites in each community where focus groups could be held, and where they could invite participants for their focus groups. These sites were community centres, local clinics, district hospital (for patients as well as providers), and military bases. In each province, the facilitators first stopped at the provincial health office to obtain permission for the study. They then travelled to the district health office in the area they wanted to work in to seek further permission to conduct focus groups in local healthcare facilities. After they had secured the necessary permissions, the facilitators went to the site of their proposed focus group to invite community members in the area to attend.

Facilitators used convenience sampling at each focus group location, and were instructed to obtain a minimum of 5 and a maximum of 10 participants per community focus group.<sup>(124)</sup> Facilitators also attempted to obtain a range of participants in their focus groups, male and female, old and young. Individuals younger than 18 years of age were not eligible to be included in the focus groups. For the healthcare provider groups, facilitators were instructed to obtain 5 participants, preferably nurses and physicians, and to attempt to have focus groups participants who were at the same

level of influence. We tried to avoid the inclusion of leadership in these focus groups, as we were afraid the healthcare providers would not feel comfortable discussing the shortcomings of emergency care provision at their facilities.

Focus groups were conducted in each province until thematic saturation was reached for that province.

### **3.2.7 Data Collection**

21 community focus groups with 183 total participants were conducted. The focus groups were conducted in English, Bemba, or Nyanja, depending on the location and the makeup of the group. The length of the focus group sessions ranged from 40 minutes to 90 minutes, with most lasting about 60 minutes.

Six healthcare provider focus groups were conducted, one in each province and three in Lusaka. The healthcare provider focus groups were conducted in English.

For both cohorts, focus groups were recorded using an audio recording device (Dictaphone).

### **3.2.8 Data Analysis**

Immediately after the focus groups were held, the Zambian facilitators translated the audio recordings into English and then transcribed them into a written document. The facilitators initially translated and transcribed their own focus groups, as this was the method that had been discussed and agreed upon in facilitator training. As Bemba and Nyanja don't exactly translate into English, there is always some degree of ambiguity, which can be compounded when discussing medical events. We agreed that the facilitators who had actually conducted the focus groups would be able to translate the recordings most faithfully, as they knew what the participants were intending to say. The translations and transcriptions were then checked by another Zambian facilitator for accuracy.

Once the focus groups were translated and transcribed, the English transcripts were sent to the investigators in South Africa. Data were analysed with NVivo for Mac (qualitative data analysis software) using the content analysis approach. In content analysis, researchers establish a set of categories, and then count the number of instances that fall into each category. Content analysis uses categories that are precise enough to allow different coders to arrive at the same results when the same material is examined.(128) Using the content analysis approach for data analysis aids in making the results reliable and valid.(128)

The primary investigator first read each transcript to form general impressions and to look for sections that might have been poorly transcribed.(129) Next, the lead investigator and another investigator independently developed codes for the data, and then met to discuss the codes and agree upon a coding strategy and definitions for each code.(128,130) Each transcript was then coded independently by the two investigators. The coding of both investigators was checked at multiple points early on to make sure that they were coding the interviews similarly.(131) Coding was compared and aggregated at the end.

The primary investigator went through the coded focus group scripts and aggregated the data by theme, and then performed a thematic analysis of the community focus groups to identify exposure to emergencies, type and frequency of emergencies witnessed, desire to provide assistance, and ideas for potential interventions. The healthcare worker focus groups were analysed to identify how emergency care is accessed and delivered in their communities, problems they see in the provision of emergency care, and how they think emergency care could be improved.

Some data were better served by using structural coding, or coding answers based on the question that was asked. This approach was used for the questions about type and frequency of emergencies witnessed.(130)

Two reports, one on the results of the community focus groups, and one on the results of the healthcare provider focus groups, were then written by the primary investigator. These reports included a code frequency report, identifying common themes, ideas, or domains. Code frequency can be compared between different sources or subpopulations within the data to explore similarities and differences.(130) and distributed to the rest of the study team, including the representatives from the ZDF and the MoH.

### **3.3 Focus Group Interviews, Kenya**

#### **3.3.1 Design**

After the study implementation in Zambia, the investigators observed which questions yielded practical data, and which questions did not work as well or were not as useful in the final analysis. A Kenyan emergency medicine specialist was brought onto the study team, and with his input the Zambian focus group script was altered to be directed more towards barriers to emergency care. Questions not found

to be useful in the Zambia study were removed, and additional questions were added based on the literature surrounding barriers to healthcare access.

Another major change to the study design in Kenya was the removal of the healthcare provider focus groups. As the Kenyan MoH was not specifically requesting this study, the lead Kenyan investigator felt that the study would be better received by the government if healthcare providers were not included, as government officials might feel that a study seeking the opinions of their providers was too negative and critical of their existing healthcare system.

Additionally, the study was scaled up in Kenya in an attempt to better represent the country as a whole. The study was designed to equally sample from all 8 of the historical Kenyan provinces (see 3.3.4, “Setting”), and was also designed to have equal representation from individuals living in both urban and rural communities. In this way, the Kenyan study was much more robust than the Zambian study.

### **3.3.2 Focus Group Script**

The final Kenyan focus group script can be found in Appendix 3. The focus group script began in a similar way to that in Zambian by asking participants about their understanding of medical emergencies, and whether they had ever experienced an emergency or if they had experienced more than three. The script then had participants describe a medical emergency they had witnessed, and facilitators used probes to determine the type of medical emergency, whether any assistance was provided at the scene, how the patient was transported to the medical facility, and any barriers encountered when seeking emergency care. The next portion of the script asked participants whether they had previously, or if they would help someone who was suffering a medical emergency. The focus groups then explored why people may or may not feel inclined to help, and what might make someone more likely to help during an emergency.

The final three questions of the Kenyan script were not present in the Zambian script. Participants were first asked about any barriers or challenges that they encounter when trying to access emergency care, and then they were asked if there were any factors that had made it easier for them to access emergency care in the past. Finally, participants were asked if there were any changes that they would recommend to improve their access to emergency care.

As described in the “Facilitator Training” section (3.3.3), the facilitators were given dedicated time during their training sessions to translate the consent form and the focus group script to Kiswahili. All four of the facilitators contributed to the translation,

and the translated consent and script were then back-translated into English to check for any mistakes.

### **3.3.3 Facilitator Training**

Four Kenyan healthcare providers were selected by the lead Kenyan investigator to participate as focus group facilitators in the project. Two of the providers were medical officers, one was a clinical officer, and one was a nurse working in the emergency centre of a private hospital in Nairobi.

After the experience of training the Zambian providers, facilitator training course was lengthened and the four Kenyans were trained over a period of four days at the end of June 2014. The Kenyan facilitators were first introduced to the study and to focus group methodology with a series of roundtable discussions on the project itself, focus group methodology, how to begin a focus group session, how to be an effective facilitator, how to consent, confidentiality, and multiple sessions on difficult situations. The facilitators then watched the primary investigator lead a practice focus group, and had the chance to discuss the strengths and weaknesses of the session and the facilitation. The facilitators then discussed each question in the focus group script to make sure they were understandable and made sense in their setting. Each facilitator was given the chance to practice consenting participants and leading their own focus group using the recording devices that would be used during the study.

In addition to having more time for each topic covered in the Zambian training, there were some new additions to the training course in Kenya. One major addition was a psychological first aid session, which was introduced to give the facilitators the tools they would need to recognise and respond appropriately to any participant who might become upset after recalling a particularly traumatic experience. Also, there was specific time set aside during the Kenyan training session for the facilitators to work with each other on translating the consent forms and focus group script into Kiswahili, and back-translating them into English to make sure no mistakes were made. Finally, the Kenyan facilitators, with the addition of the lead Kenyan investigator, were much more involved in the logistics planning for the implementation of the focus groups. In Zambia, the ZDF and Zambian MoH had been very involved in the project, and took responsibility for many of the implementation logistics. In Kenya, the MoH was not heavily involved in the project, so all logistical planning was left to the investigators.

The Kenyan facilitators were trained using a focus group guide that further adapted from the initial Zambian guide, which was adapted from the WHO and World Bank Manual for the Use of Focus Groups.(123)

### 3.3.4 Setting

In the past, Kenya was divided into eight provinces, each of which was led by a Provincial Commissioner. The provinces were further sub-divided into districts. In March 2013, a new constitution replaced the provincial system with a county system. Now, 47 counties form the first sub-division of the country, and each county is semi-autonomous. The historical eight provinces are still useful when conducting research studies, however, as it is easier to obtain results that are representative of eight different provinces than it is to obtain results that are representative of 47 counties.

In July 2014 the facilitators travelled to each of the eight historical Kenyan provinces; Central, Coast, Eastern, Nairobi, North Eastern, Nyanza, Rift Valley, and Western Provinces. Each facilitator travelled to two provinces, and visited urban and rural districts in each province. The urban district was identified by selecting the urban centre or historical capital for each province, as listed in table three. According to the Kenyan Urban Areas and Cities Act, urban areas are those that have the status of city, municipality, or town.(132) All other areas are considered rural. The rural districts for this study were selected by the facilitators to be any area that was not listed as a city, municipality, or town. The only exception to this was Nairobi Province, as Nairobi does not technically contain any rural areas. To adequately sample throughout Nairobi, purposeful sampling was used to conduct focus groups in urban upper-middle class areas, urban middle class areas, urban slums, and more “rural” areas within Nairobi.

Table 3: Kenyan Urban Centres and Rural Centres

<b>Province</b>	<b>Urban Centre</b>	<b>Rural Centre</b>
Nairobi	<sup>a</sup> Nairobi	<sup>a</sup> Ruai
Central	Nyeri	Kiamurugu
Eastern	Embu	Kangaru
North Eastern	Garissa	<sup>b</sup>
Coast	Mombassa	Ukunda
Rift Valley	Nakuru, Kericho	Sachangwan, Sigowet, Kapkatet
Western	Kakamega	Chavakali, Butali, Khayega
Nyanza	Kisumu	Gem, Kombewa

<sup>a</sup> In Nairobi, focus groups were spread between urban upper-middle class, urban middle class, urban slums, and more “rural” areas within Nairobi.

<sup>b</sup> The location of the rural focus groups in North Eastern Province were not properly recorded.

Kenya has two official national languages, English and Kiswahili. All of the facilitators were fluent and comfortable conducting focus groups in both English and Kiswahili. It was the responsibility of the facilitators to determine whether community members in a particular focus group would be better able to participate in English or in Kiswahili. In general, the facilitators defaulted to Kiswahili, as they felt the majority of participants would be more comfortable speaking Kiswahili, but they had the option of conducting the groups in English if the participants all preferred it. As in Zambia, there are also many regional languages in Kenya, but since there are two national languages it was felt that the majority of community members would be able to participate in either English or Kiswahili. If a community member did not speak either of these languages, they were excluded from the focus group.

### **3.3.5 Population**

There was only one targeted population for inclusion in the Kenyan focus groups, Kenyan community members. All community members aged 18 years and older were eligible for inclusion. Facilitators attempted to include participants of all ages and of both genders in their groups.

Children under the age of 18 years, participants who did not speak English or Kiswahili, and participants who refused to take part in the focus groups were excluded from the study.

### **3.3.6 Sampling Strategy**

The investigators worked with the facilitators to identify the urban centres and rural centres where focus groups would be conducted in each of the historical provinces. Facilitators travelled to their urban and rural centres, and upon arriving they approached the county health minister to get permission for the project. At this time, they also asked where they might be able to recruit participants, and where a suitable location for a focus group might be found.

Facilitators then recruited participants using convenience sampling at each focus group location, with the goal of obtaining a minimum of 5 and a maximum of 10 participants per focus group.(124) Facilitators also attempted to obtain a range of participants in their focus groups, male and female, old and young. Individuals younger than 18 years of age were not eligible to be included in the focus groups.

Focus groups were conducted in each province until thematic saturation was reached for that province.

### **3.3.7 Data Collection**

Sixty focus groups with 528 total participants were conducted in the eight Kenyan provinces. The focus groups were conducted in either English or Kiswahili. The length of the focus groups ranged from 30 minutes to 75 minutes, with most lasting about 45 minutes. Focus groups were recorded using an audio recording device (Dictaphone).

### **3.3.8 Data Analysis**

Immediately after the focus groups were held, the Kenyan facilitators translated the audio recordings into English and then transcribed them into a written document. The facilitators initially translated and transcribed their own focus groups, as was done in Zambia, and the translations and transcriptions were then checked by another Kenyan facilitator for accuracy. We had the facilitators translate their own scripts because Kiswahili does not translate exactly into English, and there is always some degree of ambiguity during translation, which can be compounded when discussing medical events. We agreed that the facilitators who had actually conducted the focus groups would be able to translate the recordings most faithfully, as they knew what the participants were intending to say.

Once the focus groups were translated and transcribed, the English transcripts were sent to the investigators in South Africa. Data were analysed with NVivo for Mac (qualitative data analysis software), again using content analysis and methods to optimise reliability between coders.(128) The primary investigator initially read all transcripts and identified key themes on which to construct a codebook within NVivo, which listed each theme for the transcripts to be coded into.(130) The primary investigator then provided a detailed definition of each theme and code to the second investigator who would be coding the data. The primary investigator also coded several interviews using the codebook to provide examples for each theme. A second investigator then coded several transcripts, and inter-rater reliability was assessed. Once both investigators were coding consistently, each investigator independently coded half of the focus group transcripts.(133) Since two investigators each coded half of the data, it was crucial to establish an explicit and systematic procedure for coding by developing a codebook within NVivo.(130)

Some data were better served by using structural coding, or coding answers based on the question that was asked. This approach was used for the questions about type and frequency of emergencies witnessed.

The primary investigator went through the coded focus group scripts and aggregated the data by theme or by structural code. The questions identifying exposure to emergencies and the type and frequency of emergencies witnessed were coded in a structural fashion.(130) A thematic analysis identified desire to provide assistance, barriers to emergency care, and ideas for how to improve access to emergency care. A code frequency report was also produced. Code frequency reports identify which themes, ideas, or domains were common, and which rarely occurred. Code frequency can be compared between different sources or subpopulations within the data to explore similarities and differences.(130) A report on the results of the focus groups was written by the primary investigator and distributed to the rest of the study team.

### **3.4 Ethical Considerations**

Ethical approval for the Zambia study was obtained from the University of Cape Town's Human Research Ethics Committee as well as Johns Hopkins University. As there is no ethics review board in Zambia, the Zambian Ministry of Health provided additional ethical review and approval for the study.

Ethical approval for the Kenya study was obtained from the University of Cape Town's Human Research Ethics Committee, Aga Khan University Hospital Nairobi, the Kenyan National Commission for Science, Technology, and Innovation, and the University of Maryland.

#### **3.4.1 Risk to Participants**

We did not anticipate any risk to participants by taking part in our focus groups. It is possible that a participant may have been asked to answer a question regarding a traumatic medical event that they had witnessed, and they might experience some stress or other negative emotions by recalling this event. With this in mind, we made every effort to identify the existing psychological counselling services for every community we travelled to, which were often practically non-existent. As we did not want to simply abandon a participant who was experiencing stress after recalling a traumatic event, we trained focus group facilitators using the WHO's Psychological First Aid: Guide for Field Workers.(134) The facilitators were then able to identify anyone who required counselling services, and either refer them or provide counselling themselves as appropriate. The facilitators also made sure that all participants understood they were free to not answer any questions that made them feel uncomfortable, and that they could leave the focus group at any time.

Additionally, there was the theoretical risk of healthcare providers in Zambia making negative comments about their healthcare facilities or systems, and having these comments negatively affect their jobs. This risk was mitigated by keeping absolute anonymity during the focus groups – no identifying information was collected from participants at any point. The investigators also kept the data secure and confidential.

### **3.4.2 Benefit to Participants**

The results of this study directly benefit all people living in Zambia and Kenya. The Zambian Ministry of Health and the Zambian Defence Force initially requested this study, and have already committed to using the information gathered to inform the strengthening of the Zambian emergency care system. In Kenya, leaders in emergency care will use the study results to advocate for greater emphasis on emergency care development within the Kenyan healthcare system.

Participants in this study will have a unique opportunity to voice their experiences with emergencies, and to let their governments know what they believe are the most important interventions that are needed to improve their access to emergency care. The risks to the subjects in this study was negligible, and participants understood that by volunteering to participate in the focus groups, they had the opportunity to shape the future of emergency medicine in their country. Without obtaining this information from citizens first, governments would not know where the need for intervention is perceived to be the greatest, and where they have the opportunity to affect the most good with their resources.

## CHAPTER 4

### Results

#### 4.1 Introduction

Focus groups were conducted in Zambia and Kenya with the aim of gathering information about the emergency care needs of the local community members, as well as the current way in which emergency care is being delivered.

In Zambia, 21 focus groups with 183 total participants were conducted in Central, Copperbelt, and Eastern Provinces. The focus groups were equally split between the provinces, with 7 focus groups in each. The focus groups were conducted until thematic saturation was reached. An additional six focus groups were conducted with Zambian healthcare providers. One healthcare provider focus group was conducted in each of Central, Copperbelt, and Eastern Provinces. The remaining three healthcare provider focus groups were conducted in Lusaka, one at a military clinic, and two with the participants of the “fundamentals in emergency care” educational course.

In Kenya, 60 focus groups with 528 total participants were conducted in throughout the eight provinces. A more detailed report of the location of the Kenyan focus groups can be found in table three. The focus groups were conducted in each province until thematic saturation was reached.

The results from these focus groups are summarized in this chapter. For the purposes of the focus groups and this report, “medical emergency” refers to any life-threatening condition requiring emergency care, whether obstetric, traumatic, or medical in nature (e.g. myocardial infarction, hypoglycaemia, seizure). This definition was explained to the participants, and was chosen to differentiate from emergencies such as fire or flooding.

Table 4: Kenyan focus groups

Province	Total Focus Groups	Rural Participants	Urban Participants	Total Participants
Coast	8	30	30	60
Eastern	8	32	35	67
North Eastern	8	37	33	70
Central	8	40	36	76
Nairobi <sup>a</sup>	6	8 / 22 slum	17	47
Nyanza	6	20	22	42
Rift Valley	8	42	40	82
Western	7	44	40	84
	<b>60</b>			<b>528</b>

<sup>a</sup> A more detailed breakdown of the Nairobi participants:

Rural: 8 participants from Ruai

Slum: 7 participants from Kangemi, 7 participants from Mathari, 8 participants from Kibera

Urban: 8 upper-middle class participants from the University of Nairobi, 9 middle class participants from Muthaiga

## 4.2 Community Exposure to Medical Emergencies in Zambia

### *Understanding of medical emergencies*

Community members in Zambia had a relatively good understanding of what a medical emergency is. Their most common responses, in order, were:

- That a person having a medical emergency “needs (medical) care quickly”.
- That a medical emergency is “sudden” and/or “unexpected”
- That a person having a medical emergency “needs to be rushed to the hospital”.

Less commonly, participants responded that a medical emergency was:

- A very sick person/patient
- Someone with a serious illness
- Someone who has suffered an accident
- A condition that is life-threatening
- When an illness worsens
- When there is need for urgent care to be provided for someone in the community

Responses that only received a single mention were:

- When a person’s condition cannot be managed at home.
- When there is no transportation available.

Overall, it appears that most community members understand what a medical emergency is: a life-threatening medical condition requiring immediate intervention. No one in any focus group gave an inappropriate or “wrong” answer.

#### *Exposure to medical emergencies*

When asked if they had personally witnessed or experienced a medical emergency, a majority of participants responded that they had witnessed at least one. The responses were as follows:

Table 5: Zambian exposure to medical emergencies

	Central	Copperbelt	Eastern	Total
Have witnessed at least <b>one</b> emergency	72%	58%	73%	69%
Have witnessed <b>three or more</b> emergencies	34%	32%	51%	39%

#### *Types of emergencies experienced*

Participants were asked about their experience with specific types of emergencies on two occasions, when they were asked to describe an emergency they had witnessed, and when they were asked about other types of emergencies commonly experienced in their community. The following types of emergencies were reported, in order from most referenced to least:

Table 6: Zambian emergencies

	Central		Copperbelt		Eastern		Total
	Q3	Q4	Q3	Q4	Q3	Q4	
Trauma	21	2	5		24	3	55
Paediatric	9		10		32	1	52
Labour/Pregnancy	23	3	9		2		37
Seizure	4	1	2		17	2	26
Wounds/Fractures	2	2			17	4	25
Syncope	7		2		9		18
Burns and Lightning	4	1			5	2	12
Snake Bites	5	1	4			2	12
Breathing/Asthma	5	2	3		1		11
HTN	5	2	2		1	1	11
Malaria	7	1			3		11
Diarrhoea	1	1	4		2	2	10
Poisoning	1		4		3	1	9
Foreign body			3		3	2	8
Abdominal Pain	1		1		4	1	7
Bleeding	4				2	1	7
Stroke	6						6
Vomiting	4	1					5

Chest Pain	1		1		2		4
Drowning	3		1				4
Fever	1				1	1	3
Choking					2		2
Dog Bite					2		2
Bee Sting			1				1
Electrocution			1				1
TB					1		1

Other emergencies that were only referenced once were: “fell down”, sick, illness, sweating excessively, sores on genitalia, swollen limbs, secondary infection, and cancer.

It should be noted that Question 4, “*Are there any other types of medical emergencies that you see most frequently in your community?*” was not asked to focus group participants in the Copperbelt Province. This may have an effect on the frequency that each type of emergency was mentioned.

#### *Location of emergencies*

Most participants referenced emergencies occurring in the home. Other common sites of emergencies were: locations where children were playing, on a farm, in the field, in the bush, and on public transportation such as buses. Less common sites of emergencies were: at work, at the market, at school, and at sporting events.

#### *Transportation*

In their stories about prior experiences with emergencies, private vehicles were the most commonly referenced mode of transportation to the healthcare facility. Bicycles and taxis were also commonly referenced. Walking was the fourth most common mode of transportation, followed by ambulances. Other types of transportation that were referenced include the patient being carried, ox carts, trucks, hired vehicles, and wheelbarrows.

#### *Where participants seek care*

We attempted to identify where focus group participants seek care during emergencies. The idea behind this question was to see if we could determine whether community members choose a specific healthcare facility, or whether they would simply head to the nearest facility. We also wanted to determine whether community members would head to a healthcare facility at all, or whether they would see care from other sources. While it was difficult to determine whether participants would choose a specific facility instead of the closest facility, 25% of responses mentioned going to the “nearest” facility. Several participants said that their choice of

facility would depend on where they were, which also may refer to proximity being the deciding factor. In general, clinics, hospitals, health posts, and camp hospitals were commonly referenced locations for participants to seek care. 14% specifically said that they would seek care at a government facility. Only 8% said that they would seek care from traditional healers, traditional birth attendants, councillors, or witch doctors. Other less common responses were seeking care from the police, from neighbours, from medical personnel in the community, and from the fire service. Two participants said that they would call the national emergency response number.

### **4.3 Assistance and Willingness to Help in Zambia**

When recounting their personal experiences with emergencies, most community members referenced assistance being provided to the patient at the scene of the illness or injury. Most commonly, a family member provided help for the patient; 37% of the times that help was provided was due to a family member. In 33% of the instances when help was provided, the assistance came from a general community member. If you include “neighbours” in the same category as “community member”, an unrelated community member was referenced as providing assistance more frequently than a family member. Assistance was also provided by police, co-workers, military personnel, and friends.

When asked whether they would help someone suffering an emergency, overall 85% of participants responded that they would help. 68% of Central Province, 92% of Copperbelt Province, and 95% of Eastern Province participants said they would help.

When asked *why* they would help someone suffering an emergency, the most prevalent theme was that participants feel a sense of community with their neighbours. The most common response overall was that participants would help another person because an emergency could happen to themselves at any time, and in that situation they would want others to help. The second most common response was that they love their neighbours. Other reasons to help relating to a sense of community included *“because the person needs help”*, *“because helping others is human nature”*, and *“because helping others is an expectation”*.

The second major theme was that people would help if they had the necessary training, knowledge, or resources. Other reasons to help included religion, duty, and knowing that the government would not come to the patient’s aid.

When asked why they might not help during an emergency, the most common responses were fear, lack of knowledge about the emergency and how to help, not having transportation available, and not having the equipment necessary for assisting with the emergency. Other reasons not to help included the potential to make the situation worse if you were untrained, and the fear of relatives of the patient turning against you or becoming angry if something went wrong.

When asked *how* they would help someone suffering an emergency, the overwhelming response was that people would help by providing transport for the patient to the hospital. 42% of responses referenced transportation. An additional four participants said that they would help by providing money, which could also be used to assist the patient with getting to the hospital. The second most common theme was that participants would help by providing some sort of first aid, such as stopping any bleeding. Others responded that they would provide traditional medicines, provide comfort or advice, provide food, and provide medications. Interestingly, several participants commented that you shouldn't actually provide any sort of first aid in an emergency unless you've been trained, as you could do more harm. These participants suggested that assisting with transportation would be the best way to help.

We were also interested in discovering what might make community members more likely to help during an emergency. It should be noted that this question was only asked in the Eastern Province focus groups however. When asked, respondents said that having a means of transportation would make them more likely to help. The second most common response was that having first aid training would make them more likely to help. Other responses included having medications, having courage, and having power from God. A few participants who had received prior first aid training said that they would be more likely to help if community members knew how to reach them during an emergency.

#### **4.4 Barriers to Emergency Care in Zambia**

##### *Transportation*

Transportation was the most commonly referenced barrier to care, and was mentioned in 41% of the responses. Most often, transportation was simply not available during an emergency. The distance that community members are required to travel to reach a healthcare facility was also a major barrier to care. Other barriers to care related to transportation were the time it takes for transportation to arrive for a

patient and not having enough money to pay for the transportation. Not having fuel for a vehicle and poor roads were other common barriers.

*“Our area is remote and there are no vehicles. The only vehicle which was there had no fuel. The man could not be taken to the hospital due to absence of transport and he died after some time.” - Central*

*“We come from very distant places and the roads are too bad.” - Central*

*“It’s a problem here finding transport when you do not have money. Even borrowing money from those who have is a problem. Not many are willing to give.” - Eastern*

*Healthcare provider*

26% of the responses referenced a barrier to care relating to the healthcare provider at the facility. Participants felt that the staff at healthcare facilities had bad attitudes, and thought that they should be providing care for patients suffering emergencies more rapidly. Another common barrier was staff shortage and lack of manpower at healthcare facilities. Participants were also concerned that there was no prioritisation at the healthcare facilities, and felt that providers should be prioritising or triaging patients instead of relying solely on queue order. Additionally, some participants referenced a lack of specialised care, and long shift changes during which providers would not see patients.

*“Another thing is that in hospital very sick patient are not given priority but just advised to follow the queue.” - Central*

*Lack of community knowledge*

The third most commonly referenced barrier to care was a lack of community knowledge about medical emergencies and emergency care. Participants often said that they did not know what to do when they encountered an emergency, or when they said that they had provided assistance, it was an intervention that was counterproductive for the patient.

*“People in the communities are dying due to lack of knowledge on what to do when faced with problems/emergencies.” - Eastern*

*Referral system*

The fourth most commonly referenced barrier to care was relating to the referral system. Often, the initial healthcare facility would be unable to care for a patient suffering an acute illness or injury, and the patient would need to be transferred to a higher-level facility. During these instances, community members say that the patient

often receives no care or stabilisation at the lower-level facility, and they certainly don't receive care during transport. Referrals cause problems with transportation too, as patients often are responsible for finding their own transportation to the higher-level facility. This further compounds the initial time and cost it took them to reach the first facility. Many participants felt that the referral pattern was a major barrier to care because they were forced to first go to a facility that was unable to care for their emergency, further delaying their care.

### *Money*

Money was another commonly referenced barrier to care. Most respondents who mentioned having difficulty with costs were talking about the cost of transportation.

### *Additional barriers*

Additional barriers to care include:

- Not having available healthcare facilities that are close to, or easily accessed by, the community.
- Community members not being able to communicate due to a lack of cell phone service, and communication challenges preventing ambulances from finding the patient.
- Fears in community members that prevent them from assisting a person suffering an emergency.
- Certain conditions or events are required to be sent to the police first, before the patient can go to a healthcare facility. Several participants referenced situations where emergency care was delayed because the patient was brought to the police station before the healthcare facility, or because the patient had to wait on scene for the police to arrive.
- A lack of available training and equipment for community members who would like to assist during emergencies.
- Some military personnel felt that emergencies suffered by community members were taken more seriously than emergencies suffered by military personnel, and that even in an emergency military personnel would not be excused from duty to go see a healthcare provider.

## **4.5 Community-Identified Solutions in Zambia**

When asked what could be done to improve their access to care, most focus group participants suggested that a program should be initiated to train community first aid

responders. Another common suggestion was to implement a prioritisation system such as triage in healthcare facilities. Other suggestions included: building more healthcare facilities or having mobile clinics to reach those located far from current facilities; increasing current healthcare facility hours; increasing the number of ambulances available for transportation; having one centralised emergency number that is known by all, and that can be reliably accessed; identifying means of transportation in each community that can be utilised in an emergency; increasing the number of providers in healthcare facilities, and making sure that providers do not leave their clinics to do private work; paying healthcare providers more money to incentivise them to work better; providing first aid kits and protective clothing for community first aid responders; and improving the referral system.

*“There is also need to train also Community Health Workers to help.” - Central*  
*“Having means of transport such as a bicycle, in order to transport a person quickly to the clinic because we do not have the means to diagnose a person in the community.” - Eastern*

#### **4.6 Healthcare Providers in Zambia**

##### *Understanding of medical emergencies*

Healthcare providers had a strong understanding of what a medical emergency is. In each group, respondents identified medical emergencies as being “life-threatening” and needing “rapid or immediate intervention”. Other responses were that medical emergencies “occur suddenly” and are “unforeseen”. It should be noted that this question was only asked in 3 of the 6 healthcare provider focus groups.

##### *How facilities handle medical emergencies*

The second most frequent response (15) was that the patient would first be assessed. This informs the rest of the response to the patient

After assessment, three respondents mentioned that the initial status of the patient would be used to decide whether the patient would see a physician right away, or would wait with the rest of the patients. The initial status of the patient was also used to determine whether that provider called for help or decided to transfer the patient.

Another popular response was to call for help. (9) Many facilities have staff on call, who need to be called in to help with emergency cases. This is especially important for facilities with only one doctor, as the doctor often needs to be called in. Other staff that could be called in include surgical teams.

Seven respondents mentioned stabilising the patient before either transferring them to the wards or referring them to another facility

After initial stabilisation, a common pathway was to refer the patient. Referral was mentioned in 22 instances, and was the most frequently referenced theme. In most cases, assessment and stabilization preceded referral. Some facilities were able to use an ambulance to send cases; others had to use a taxi. One respondent mentioned their facility had a vehicle that could be used to transport patients. Others said that they had used their own private vehicles in the past. Respondents said that maternity cases were more likely to be transported by ambulance than patients who were ill or injured. The decision on whether to refer depended on many factors, such as the condition of the patient, the available resources, and the time of day (and availability of physician at the facility). Referral to government or military hospital depended on the patient, but for some conditions even military personnel needed to be referred to the government hospital. In the majority of cases, patients travelled to the receiving facility unaccompanied by a healthcare professional. Only one respondent mentioned informing the receiving facility prior to arrival of patient

Some respondents said that their facilities might keep the patient after stabilization and admit them to the medical ward or to the ICU. In 12 instances, treatment of the patient was mentioned. Treatments mentioned included administration of IV fluids, wound care, and generic “drugs”. One respondent mentioned protocols for treatment in all departments

Some respondents reported that their facility received casualties 24 hours a day. In 24-hour facilities, an alerting system was used during the nights to alert providers to the arrival of an emergency patient.

Three respondents mentioned that patients who need surgery are able to proceed directly from the outpatient department to the theatre.

In six instances, respondents mentioned that their facility had a dedicated emergency bay, usually in the outpatient department. In some instances, respondents reported that the emergency bay was fully equipped for resuscitations, while others didn't mention the equipment present in the room. Two respondents discussed assigning duties to those present, or knowing your role as part of the team during resuscitations.

One provider said their facility didn't have an emergency bay, so emergencies are taken straight to the inpatient ward on arrival.

Three respondents, all from Central province, mentioned that a receiving hospital would be alerted before an emergency patient arrived so that resources could be mobilised. This included informing other departments, such as the inpatient wards.

One respondent mentioned that they would isolate any potential infectious disease cases prior to assessment. Another respondent mentioned taking specimens for the lab and sending them within 2 hours of patient arrival.

One respondent mentioned a mass casualty RTI where the hospital was alerted, transport was organized at a provincial level, and the trauma team went to the scene with the ambulances.

#### *Medical documentation*

Most participants said that each patient at their facility has a blank book where all of their information is recorded. They also reported that all patients presenting to the outpatient department are documented in the outpatient department register. Other forms of documentation include admissions forms, birth records/delivery registers, consultation forms, death certificates, discharge forms, lab forms, long term history forms, nursing care plans, partographs, post natal records, radiology forms, referral forms, sexually transmitted infections registers, and ward registers.

An issue that arose was that although documentation at a facility may be standardized, the forms are often not available.

#### *Access for civilians vs. military personnel*

When asked about any differences between the way civilians and military personnel access emergency care, the majority of responses (15) indicated that civilians and military personnel access emergency care in the same manner regardless of the facility. Respondents said management was dictated by severity of the condition, not by patient affiliation, and that all patients would receive the necessary treatment

Respondents also reported that there would be no barriers to civilians seeking emergency care at a military facility – the patient would be assessed and stabilised first regardless, and the identity of the patient would only be taken into account later on. Two respondents mentioned that at military facilities there was a policy that all patients must be assessed and stabilised first before transferring them to a government hospital

One respondent said that at their facility, if the injuries of a civilian and a soldier were of the same severity, the soldier would be attended to first. Other respondents stated

that the only difference in care would come after initial stabilisation, where a military person may be transferred to a different hospital than a civilian.

The only barrier to civilians receiving care at a military facility that respondents identified was at the main gate. Some said that the guards at the gate wouldn't bother with identification if the condition of the patient was critical. But others thought that the gates could be a potential barrier, especially at night when guards may be stricter with identification requirements and civilians may have a harder time gaining access.

Other responses discussed the general pathway to care, which upon entering the facility may include registration and screening, or proceeding directly to a treatment/resuscitation room depending on the severity of patient.

Several respondents (5) mentioned that military personnel would expect to be seen first, even if the healthcare provider thought another patient needed attention more urgently. These respondents said that military personnel would harass or command civilian healthcare providers in some instances.

One difference between military and civilian access to care that was identified was that a hospital is more likely to be alerted in advance if a military person is coming to their facility, and civilians are more likely to arrive unannounced. Another difference is that the Ministry of Defence pays well for soldiers and officers to receive medical care at government facilities, so they often receive better treatment than civilians who are unable to pay. This difference in care would only come after initial stabilisation of the emergency, however.

#### *How emergency care is currently delivered*

When asked how emergency care is currently delivered in their country, most providers said that the emergency care system in Zambia was "poor" and "not well established" (13). Other words used to describe the system were "pathetic" and "needs urgent attention".

Several respondents said that the current system is too centralised, with emergency care only occurring at the largest health centres. Patients are supposed to present to the nearest community clinics when they are sick, and may be referred to a higher-level facility if necessary. If it is a true emergency they may bypass the clinic, but if it is deemed to not be an emergency they may be charged a bypass fee.

Most emergencies present to the outpatient department, and while in district hospitals the hospital doctor takes care of all patients, in larger referral centres

specialist physicians will immediately take their relevant patients. There is no general provider who sees all emergencies when they arrive.

One participant said *“I think the first people who are actually there to provide emergency service to the casualties, usually you have villagers or people from the surrounding area.”* Many agree that the first “responders” are generally community members, who may help with transportation.

*“But I think that the tendency shows that people are very willing to help. This is one positive thing. But it’s educating them to do the right thing, the willingness is there.”*

#### **4.6.1 Provider-Identified Barriers to Emergency Care**

##### *Community knowledge*

Several providers referenced traditional remedies that community members try before bringing the patient to the clinic or hospital, which delay time to care and worsen the patient’s condition. Others said that community members may not even be able to identify that someone is suffering from an acute condition requiring emergent care, and that they need to get to the hospital quickly. Community members often do not know how to assist a patient who is suffering an emergency. Few community members have been trained in first aid. Lack of community knowledge may also lead to fear; one participant mentioned that if blood was involved people might be reluctant to help because they fear the blood. Other reasons why community members might not help include false beliefs that conditions (such as seizures) can be passed by touching the patient. Participants also reported that police officers are not trained in first aid, or on what to do at the scene of an accident.

##### *Police*

Another barrier that was commonly referenced was the policy of reporting an assault to police first. Although some participants stated that critical patients could be seen by a doctor immediately, there seemed to be ambiguity and inconsistency on how this policy was actually practiced. One participant said some doctors might not attend to a patient before they have been seen by the police. Transportation between the police station and the hospital can also be a barrier.

##### *Referral pattern*

The need for patients to first present to a clinic, and then to find transport if their condition requires care at a higher level facility, was perceived as a barrier by providers.

#### *Transportation*

Many providers said that there were no ambulances that would pick patients up from their homes; ambulances would only be used for inter-facility transports, and even that was not guaranteed. Even if a facility had an ambulance, it was often broken or had no fuel and could not be used. In the instance that an ambulance actually works, it doesn't have the necessary equipment to care for a patient during transport.

Money was mentioned as a barrier, but only in reference to transportation, as emergency services are free. Poor road conditions and lack of bridges were also cited as a barrier to transport, as well as unlabelled streets and general lack of road signs.

#### *Communication*

Several providers discussed the lack of an emergency line for community members to call and the lack of radio systems for healthcare facilities to communicate with each other, particularly relating to referrals.

*“Speaking from a civilian point of view I will tell you it is a nightmare trying to access ambulance service. To start with the number 991, I don't know if at all it works. The many times I have tried it for various reason, it does not go through.”*

One provider said that although you could call the fire brigade, by the time the message was communicated and they arrived on the scene of an accident it would be far too late.

#### *Distance to facility*

Several providers referenced large catchment areas and long distances to facilities as barriers to care; their facility may cover an area of over 30,000 people, with the furthest being 65 km away from the facility. In these instances, transportation is also a major barrier and it may take patients half a day to reach the facility. Distance to the healthcare facility is also a barrier when a patient is being referred to another hospital, as that hospital is usually far away.

#### *Difficulty for civilians to access military facility*

As stated previously, several participants felt that it may be difficult for civilians to access care at a military facility due to need for identification at the gate. This was

perceived to be more difficult at night. Another participant said that some civilians might fear to go to a military camp clinic because providers there “work in combat”.

#### *Hospital structure*

Many facilities do not have a dedicated emergency bay or room where acute cases are managed, and this was perceived to be a barrier to care. Healthcare facilities were also identified as being too small, poorly equipped, and not constructed to optimally handle emergencies. There is often no space to triage patients and no designated areas for separating patients of different acuities. Additionally, the distances between the outpatient department and the inpatient wards can be large, and there is no equipment to move patients from one location to the other. In the event of a major incident, the outpatient department may not be able to accommodate a large number of patients, and the wards are not properly equipped to handle emergencies.

#### *Lack of proper/sufficient equipment and resources*

Several providers spoke of a general lack of equipment and resources, and some specifically referenced a lack of resuscitation equipment.

#### *Hospital staff*

Some providers felt that hospital staff had poor work attitudes and lacked urgency. Others said that there was a shortage of manpower in general at healthcare facilities, particularly at night when there might not be a doctor present.

It was also recognised that healthcare providers are not trained in emergency care. There are no specialised emergency care providers in the country, and there are very few opportunities for healthcare providers to receive any training in emergency care.

*“I think we heard in one of the presentations where someone sat on the queue for a long time, the aspect of triage is actually at times absent, so you find even emergencies, when they arrive at the hospital, it’s not every medical personnel who has that attitude of saying oh this is an emergency let me treat immediately”*

#### *No care at point of injury or illness*

Participants said that community members and police officers do not provide proper care for patients at the scene of an injury or illness. The providers felt that there should be care provided on the scene of an accident, either from police officers or from pre-hospital personnel. They felt that drivers of ambulances should be trained as healthcare providers

### *Time to reach hospital*

Time to reach hospital was generally considered a barrier, both due to delay by community members in seeking care, and due to difficulties with transportation and distances to facilities. The referral pattern also contributes to delays.

### *Overall lack of emergency care system*

Several participants mentioned that currently, any response to an emergency is entirely based on that individual provider. There are no standard protocols for emergency care. This lack of protocols also prevents coordination in response to emergencies and mass casualty incidents.

*“It’s an issue of having no system in place, actually there is no system. Whatever we are doing, it’s just based on individual kind of knowledge or situation appreciation. As you appreciate the situation as an individual not that maybe there is a system in place, no. So that is I think the biggest challenge we have.”*

### *Additional barriers*

A few participants referenced a lack of a triage system as a barrier to timely emergency care. Another participant cited pick pocketing and scavenging by bystanders as a reason that an accident victim might not receive care in a timely fashion. One participant said that community members may fear that there will be a lack of confidentiality among members of the healthcare facility staff, so may avoid the facility. One participant discussed language barriers, as many patients come from outside Zambia and are unable to communicate with healthcare team.

## **4.6.2 Provider-Identified Solutions**

When asked how Zambia’s emergency care system could be improved, several respondents mentioned that they would like to see the “major problems” that they had previously listed addressed. Other, more specific solutions were:

### *Community education*

The most common answer to this question was to create outreach programs to educate community members about medical emergencies and first aid. This would include teaching community members how to recognise a medical emergency, what to do to get the patient to necessary care, and how to provide first aid. Providers also specified that it would be important to teach about instances when ambulances are not necessary in order to avoid burdening a limited resource. Providers also felt that

there should be AEDs in public places, and that community members should be trained to use them.

*“Once those people in the community are trained, at least will be able to provide some relief to some of these things, issues to do with transport, because transport we are looking at transportation to the nearest place where they can have some care. So if people are trained in the community, we are trying to assist on the issues of transport, distance, and we would have given the knowledge to the people around that area. And would also even assist on the part of issues to do with the shortage of staff, trained staff, because they would be able to offer that first aid, which is more critical in emergency care, especially in the first one hour. So I think that point cannot really be overstressed.”*

#### *Improved transportation*

Providers wanted ambulances equipped with basic life support equipment that would allow for patient care during transport. They also suggested that there should be more ambulances, or that better means of emergency transportation should be identified.

*“Okay. I think the government should also consider buying ambulances that could be sent to far fetched areas where I think they are needed most. At least here, it’s easier to transport a patient, and maybe where our colleague is, in such places they can be located in a particular type of catchment area, maybe three, where they can combine maybe three catchment areas and then they put one ambulance and if there’s a radio I think they can easily be communicating. To depend on someone’s vehicle, and you just have fuel at the hospital, say you have an emergency you might call him, you might find him he is in town, what do you do you are stuck?”*

#### *Provision of pre-hospital care*

Respondents would like to see trained personnel working in the pre-hospital sector with the proper equipment to care for patients before they reach the healthcare facility, and also to allow for care during inter-facility transports.

*“We have cases where you are taking a patient to Lusaka and you are ambu-bagging all the way and the bed is not fixed. When the vehicle moves, you also move with the bed while busy with ambu-bag. It is like an adventure.”*

*“We usually think of an ambulance to pick up the patient and bring them to the hospital but there is a need for that system where people can call for an ambulance and paramedics perhaps will come and they could administer some care right there, because for him to pick up a patient and coming back that’s time, that is more time. There is a delay in going there and then there is another delay to go back, so I think that we should shift from the way we view the services to say bring about such services, that would really help.”*

#### *Collaboration with other agencies (such as police)*

Providers wanted police to receive basic training in emergency care so that they would know what to do at the scene of an accident. They also suggested a system where healthcare professionals could respond to an accident scene alongside the police and triage patients at the scene so the proper patients would reach the hospital first.

*“There is need for networking. For example with stakeholders such as the airport, the police and Air force with each one of them doing their specific roles efficiently.”*

*“What I would like to see is a functional Trauma Unit which will involve the police, RTSA and Fire Brigade. We will need to sensitise the community and tell them what is expected in case of an emergency.”*

#### *Decentralise care*

Providers felt that emergency care should be provided at all levels of the healthcare facility, and not only at the large referral centres. As patients often travel to several healthcare facilities before reaching a referral hospital, provision of emergency care at lower-level facilities and in the pre-hospital setting would provide patients with earlier access to care.

*“To save lives emergency care should not be concentrated at the Central hospital. Let it be decentralised in the communities where these emergencies are occurring so that care starts from the actual site of the accident.”*

#### *Better communication*

Providers wanted a national toll-free number that community members could call in an emergency; one that works, and that people know about. They also wanted improved communication between facilities, so that hospitals would know if they are receiving emergent transfers.

#### *Dedicated emergency rooms in healthcare facilities that are properly equipped*

Many providers wanted to see dedicated areas for acutely ill and injured patients in healthcare facilities. It was also mentioned that these emergency rooms should have a dedicated “casualty officer” whose job it is to stay and wait for critical patients

The lack of equipment necessary to stabilize and treat these emergent patients was also mentioned numerous times.

*Train staff of healthcare facilities in emergency care*

Another popular response was that healthcare facility staff should be trained to handle emergency conditions. One respondent said that all healthcare personnel should be trained, to avoid the common scenario where the few providers who receive training leave to go work elsewhere.

*Develop standard operating procedures for emergency care*

Several providers wanted national standard operating procedures for emergency care. They felt that standard operating procedures are necessary so that when critical patients present to a healthcare facility, or mass casualty scenarios arise, there is a standard approach to deal with the situation. Some also discussed beginning with local protocols, such as standardizing the approach to emergency care at a particular healthcare facility.

*“So there is a lot of things that needs to be ironed out where we all know when there is an emergency you don’t need to start guessing what to do, it’s like there is a protocol that you follow you just trigger a certain system and it’s full throttle. That is lacking, it is not there. Like he said it is whoever is there, how he feels at that time, that is how the response will be.”*

*“And for us in the rural also maybe the next would be for the community to, probably, brainstorm and come up with a system on how to move the casualties. You know in these villages there could be somebody with a vehicle or something probably who could organize some resources just for standing by, because you don’t know [chatter] the facilities what we used to do when the funding is okay, we used to have fuel, so when you have a maternity case and there is no vehicle you just get the vehicle from somewhere, put in your fuel, and transport”*

*A dedicated emergency care system*

Overall, providers want to see a dedicated national emergency care system that is accessible to all Zambians. Many respondents said that wealthy Zambians do often have access to emergency care, and that whether or not you receive emergency care depends primarily on your economic status. Providers would like to see a system where all people have equal access to emergency care.

*“We are talking about infrastructure, human resources, equipment, medicines, all those things they are needed because even the systems to be put in place, communications all those areas are affected. So it is just a matter of approaching it holistically, though it can take time but it should start from somewhere and then start following it up until it trickles down to the community. Of course it has to start up there with political will so that’s how it can be tackled.”*

#### *Additional suggestions*

Additional suggestions included emphasising rapid response to emergencies both in the pre-hospital setting and in the facility-based setting. Some military providers wanted to be able to use their base’s ambulance without first requesting the permission of their commanding officer. Providers suggested that there should be continuous, life-long learning opportunities for healthcare providers related to emergency care. And some wanted to see the formation of a Zambian emergency care society. Overall, providers wanted to see this needs assessment produce real interventions and change based on their suggestions.

*“I would wish if there could be a forum where we could share, it could be an internet forum where we could just keep remembering each other even if it is not making sense we just remember the joke you made in this scenario. You share experiences, I know for me we are yet to experience more things we have loved and want to bring to the attention of everyone. So my wish is I hope this does not end here. In line with that we can maybe form an association of emergency first aid responders where you meet deliberately and frequently where you discuss the development the challenges and you speak with one voice. In that way you can propel things to another level. I also dream.”*

*“Other countries have associations that are a way of communicating between different countries, so we hope that we reach that level.”*

## **4.7 Community Exposure to Medical Emergencies in Kenya**

### *Understanding of medical emergencies*

Most focus group participants had a solid understanding of what constitutes a medical emergency.

The most common response to the question “What is a medical emergency?” was that a medical emergency requires rapid or urgent treatment, either pre-hospital or in a hospital, and this treatment is in order to save a life or to prevent the patient from getting worse.

The second most common response was that a medical emergency is the initial treatment or services offered to an ill or injured person, such as first aid. The third most common response was to use a specific disease as an example (listed below).

Additional words or phrases used to describe medical emergencies include: accident, unexpected, sudden, sick, requires assistance, disease, large-scale catastrophe or disaster, requires an ambulance, when free care is provided, happening at night, risk of death, and injured.

Specific diseases used as an example: bitten by a snake, wound, broken hand, cut, nose bleed, fallen, bleeding, fit, fall from a tree, fall in river, attack by robbers, burnt cooking, hit by car, woman in labour, MVA, burns, epilepsy, palpitations, severe abdominal pain, diabetic with collapse, poisoning, fainting, collapse, heart attack, choking, and malaria

#### *Exposure to medical emergencies*

Medical emergencies are quite common in these communities, with 70% of focus group participants having personally witnessed one or more.

Table 7: Kenyan exposure to medical emergencies

	<b>Rural</b>	<b>Urban</b>	<b>Total</b>
Have witnessed at least <b>one</b> emergency	66%	73%	70%
Have witnessed <b>three or more</b> emergencies	36%	31%	34%

#### *Types of emergencies experienced*

Participants were asked about their experience with specific types of emergencies on two occasions, when they were asked to describe an emergency they had witnessed, and when they were asked about other types of emergencies commonly experienced in their community. The following types of emergencies were mentioned by focus group participants, and are categorised into traumatic emergencies, medical emergencies, and obstetric emergencies. Traumatic emergencies are shaded red, medical emergencies are white, and obstetric emergencies are shaded purple. The emergencies are then listed in order of how often they were referenced.

Table 8: Kenyan emergencies

<b>Total</b>		<b>Rural</b>		<b>Urban</b>	
Trauma	56%		52%		59%
Road traffic accidents	16%	Road traffic accidents	16%	Road traffic accidents	16%
Assault/Mob justice	7%	Assault/Mob justice	7%	Burns	7%

Burns	6%	Burns	6%	Assault/Mob justice	7%
Blunt trauma	5%	Blunt trauma	5%	Blunt trauma	5%
Bleeding (traumatic)	4%	Bleeding (traumatic)	4%	Bleeding (traumatic)	4%
Fractures	3%	Penetrating trauma (stabbing, GSW)	3%	Fractures	4%
Other trauma <sup>a</sup>	3%	Fractures	3%	Other trauma <sup>a</sup>	4%
Penetrating trauma (stabbing, GSW)	3%	Other trauma <sup>a</sup>	3%	Snakebites	3%
Snakebites	2%	Riots/Mass casualty incidents	2%	Penetrating trauma (stabbing, GSW)	3%
Riots/Mass casualty incidents	2%	Sexual assault/Rape	2%	Riots/Mass casualty incidents	2%
Sexual assault/Rape	1%	Snakebites	1%	Electrocution	2%
Electrocution	1%	Electrocution	1%	Suicide	1%
Suicide	1%	Bites (dog, spider, crocodile)	<1%	Bites (dog, spider, crocodile)	1%
Bites (dog, spider, crocodile)	1%	Suicide	<1%	Sexual assault/Rape	1%
Dislocation	<1%			Dislocation	<1%
Medical	31%		33%		30%
Loss of consciousness	6%	Loss of consciousness	8%	Difficulty breathing/Asthma	6%
Difficulty breathing/Asthma	5%	Overdose/Poisoning (alcohol, drugs, poisons, pesticides)	4%	Loss of consciousness	5%
Overdose/Poisoning (alcohol, drugs, poisons, pesticides)	4%	Drowning	4%	Overdose/Poisoning (alcohol, drugs, poisons, pesticides)	4%
Drowning	3%	Difficulty breathing/Asthma	4%	Seizures/epilepsy	4%
Seizures/epilepsy	3%	ID exposure	2%	Drowning	2%
Hypertension	1%	Non-traumatic bleeding (nose, ulcers, varicose veins)	1%	Infection	2%
Infection	1%	Seizures/epilepsy	1%	Malaria (cerebral)	1%
Infectious disease exposure	1%	"Sick" (nonspecific)	1%	Hypertension	1%
Pneumonia	1%	Chest pain/Heart attack	1%	Chest pain/heart attack	1%
Non-traumatic bleeding (nose, ulcers, varicose veins)	1%	Foreign body (in airway)	1%	Pneumonia	
Malaria (cerebral)	1%	Hypertension	1%	Abdominal pain	1%
Chest pain/Heart attack	1%	Pneumonia	1%	Foreign body (in airway)	1%
Foreign body (in airway)	1%	Abdominal pain	1%	Headache	1%

“Sick” (nonspecific)	1%	Diabetes	1%	ID exposure	1%
Abdominal pain	1%	Fever	1%	Non-traumatic bleeding (nose, ulcers, varicose veins)	1%
Diabetes	<1%	HIV	<1%	Diabetes	<1%
Malignancy	<1%	Infection	<1%	Food poisoning	<1%
Fever	<1%	Malaria (cerebral)	<1%	HIV	<1%
Headache	<1%			Malignancy	<1%
HIV	<1%			Pain	<1%
Food Poisoning	<1%			“Sick” (nonspecific)	<1%
Pain	<1%				
Obstetrics	10%		12%		9%
Labour	6%	Labour	7%	Labour	5%
Birth complications, ectopic pregnancy, abortion complications	4%	Birth complications, ectopic pregnancy, abortion complications	5%	Birth complications, ectopic pregnancy, abortion complications	3%
Not a medical condition <sup>b</sup>	3%	Not a medical condition <sup>b</sup>	3%	Not a medical condition <sup>b</sup>	3%

<sup>a</sup> Sports injuries, eye injuries, self-circumcision, accidents, buried alive, children hurt while playing, hanging, overeating

<sup>b</sup> Fires, capsized boats, floods, drought, famine, rescue from building collapse

#### *Location of emergencies*

Medical emergencies are common occurrences in these communities, and they occur in all types of locations: at home, at schools, at work, on the sports field, and on roads.

#### *Transportation*

Community members suffering medical emergencies reach healthcare facilities by:

Table 9: Kenyan transportation

	<b>Total</b>	<b>Rural</b>	<b>Urban</b>
Private cars	31%	30%	31%
Motorcycles	17%	14%	20%
Ambulances	15%	17%	14%
Taxis	14%	20%	9%
Walking or being carried	8%	8%	9%
Minibuses	6%	6%	7%
Police vehicles	4%	1%	7%
Tuk-tuks <sup>a</sup>	2%	1%	2%
Aircraft (planes and helicopters)	1%	1%	1%
School buses	1%	1%	
Lorries <sup>b</sup>	1%		1%

<sup>a</sup> A three-wheeled rickshaw, often used to transport passengers

<sup>b</sup> A truck, often used for transporting goods

#### *Where participants seek care*

More participants said they sought care at government healthcare facilities than at private healthcare facilities, but participants also said that there were significant delays at government facilities, and that you were able to receive care more quickly at a private facility. Participants also said that many government healthcare facilities did not provide emergency care, while private facilities usually did.

#### 4.8 Assistance and Willingness to Help in Kenya

Most of the stories that participants told about emergencies they had witnessed included help being provided to the patient. The types of people who were providing the help in these stories were (in order of frequency):

Table 10: Kenyans providing assistance

Help provided by:	Response Rate
Bystanders (Good Samaritans)	32%
Family members of the patient	24%
Community members (neighbours)	17%
Classmates, colleagues, and friends	15%
Healthcare professionals (outside of the healthcare facility)	6%
Soldiers or police officers	5%

The rates of responses are only reported for overall, as there was no difference in the order of those providing assistance between the rural and urban focus groups.

In the stories told about witnessed emergencies, help was provided for victims in many ways. Most commonly, the victim was assisted with transportation to a healthcare facility. In order of frequency of mention, help was provided to victims in the following ways:

Table 11: Assistance provided in Kenya

Help provided	Response Rate
Assist with getting to healthcare facility	49%
Provide first aid <sup>a</sup>	17%
Provide other remedies <sup>b</sup>	9%
Call for help	7%
Move or position patient, extricate from danger	5%
No help provided	3%
Give medication (either the patient's own or provided by the helper)	1%
Distract or calm the patient	1%
Provide financial assistance (such as paying for cab, paying hospital fees)	1%
Provide information (to police officers,	<1%

family members of the patient)	
Donate blood	<1%

<sup>a</sup> Types of first aid mentioned included those for trauma patients such as stopping active bleeding, splinting a broken extremity, and reduction of dislocations; first aid for medical patients such as removing the clothes of someone who has lost consciousness, covering a patient with a blanket, giving sugar solutions to diabetics, rescue breathing, and fanning the patient or placing a cool cloth on their forehead; and first aid for obstetric patients, delivering an infant.

<sup>b</sup> Other remedies mentioned included pouring battery acid on a bleeding wound, herbs for snakebite, cutting snakebite and tying proximally, pouring water on patient, compressing stomach of someone who has drowned to induce vomiting, placing a spoon in the mouth of seizing patient, giving soapy water or ashes for poisoning, shaking unconscious patients, and giving raw eggs to induce vomiting.

These types of assistance were mentioned by participants in both rural and urban focus groups, and the ranked order of responses given did not differ between rural and urban groups.

When asked if they would help someone, or if they had previously helped in the past, focus group participants demonstrated great willingness to help each other during medical emergencies. 67% of participants had helped another person suffering a medical emergency in the past, and 84% said they would help in the future.

Table 12: Willingness to assist in Kenya

	Rural	Urban	Total
Would help	81%	86%	84%
Have helped	63%	71%	67%

People choose to help others suffering from medical emergencies for many different reasons. When asked why they would help another person, focus group participants' responses fell into four categories: feeling they were morally obligated to help (42%), wanting to relieve the suffering of the patient (34%), reasons specific to a particular incident (13%), and having the resources needed to help (11%).

#### *Feelings of moral obligation*

Participants most frequently answered that they would help another person due to a moral imperative to help someone who is suffering, or due to feelings of compassion, love, respect, empathy, pity, or mercy for the patient. Other responses in this category were that they may need help one day and would want another person to help them, it is human nature to help one another, helping makes you feel good, life is valuable, religious imperatives, and being brave.

*"I can help even if you are my enemy because I am human; the next day it could be me." – Coast, Rural*

*"It's a good thing to do, and once you've helped someone am sure that person will take it upon themselves to also pass that goodness." - Nairobi, Urban*

### *Relief of suffering*

Another common theme was that participants would not want to see another person suffer. They would provide assistance to save a life, to help the patient feel better, and because the situation is critical, the victim needs help, or is in pain.

### *Specific to the incident*

Some participants gave reasons to help that would only be applicable to certain instances. Participants said that they would help if they were the only one available, if they had an occupational responsibility (such as being a teacher, healthcare provider, or in the military), if the incident was similar to an emergency they had experienced in the past, or if they caused the emergency.

### *Having the necessary resources*

Participants also answered that they would help if they had the necessary knowledge or skills, the money, or other resources such as a car.

Focus group participants also provided thoughtful reasons why they might not help someone who was suffering a medical emergency. These major themes that these reasons fell into were: it could cause inconvenience or actual harm to the person helping (44%), a lack of knowledge or equipment to properly assist (36%), specific attributes of the patient (15%), and helping might be too difficult or unreasonable (4%).

### *Inconvenience or harm to the helper*

The most prevalent concern was that helping someone might be inconvenient or cause harm to the person who was helping. Specific concerns were that helping a patient might put the helper in a dangerous situation, the helper might be blamed for the accident or involved in legal proceedings, a person might be afraid to help, providing assistance might be inconvenient as they could need to answer many questions from police and doctors or be a witness at court, helping might be very costly, or the person simply may not feel morally obligated to help.

*“You can be afraid to help because in the example of road accidents, our government can arrest you on trumped up charges. You may be helping someone who is injured and when you take them to hospital only to realise that he was the thief which can get you in trouble. Such scenarios can make you not want to help someone.” - Western, Rural*

#### *Lack of knowledge or equipment*

Another major concern was that a person might not have the knowledge, ability, confidence, or equipment necessary to help. In fact, a lack of knowledge on how to help and a lack of personal protective equipment were the two single most prevalent concerns that would stop a person from helping during a medical emergency.

*“If you do not understand you wouldn’t know where to start.” - Eastern, Urban*  
*“There are some that require medical attention, so you may not know how to help, you might do something wrong or make the situation worse” - Nyanza, Urban*

#### *Negative patient attributes*

Participants also reported that specific attributes of the patient might dissuade people from helping. One common concern was that the patient might be a thief, or might be your personal enemy, and then you would not want to help them. Other concerns were that the patient might be a drunk or a terrorist, might not speak your language, might not want to be helped. A few male participants said they would be hesitant to help if the patient was a woman. Additionally, some people mentioned that they might be prejudiced against the patient due to tribe or class differences, the way the patient is dressed, or if the patient had attempted abortion.

#### *Circumstances*

Participants noted that in some circumstance, helping a patient might be too difficult, such as if you were unable to access the patient, if there were too few others to assist you, or if there were too many other people already trying to help.

Several participants emphasized that there is no reason not to help, and they would help no matter what.

When asked how they would hypothetically provide help to someone suffering a medical emergency, many participants responded that they would help in any way they could. More specifically, participants answered that they would (in order of frequency mentioned):

- Provide medical care <sup>a</sup>

- Provide transport
- Get help (call police, call ambulance)
- Give patient money (for transport or medical expenses)
- Provide encouragement and support to the patient
- Assist with communication, provide information to family members and police
- Give patient food
- Donate blood
- Remove patient from immediate danger
- Refer the patient to proper care
- Provide medication
- Pray
- Provide space for patient to recover
- Let a sick person jump the queue in a healthcare facility
- Extinguish a house fire
- Pity the patient

<sup>a</sup> Such as: stop bleeding, tie snake bite, chest compressions for drowning, sugar/salt in bleeding wound, splint, put person in shade, give ORS, water or oil on burn, herbal remedies, rescue breaths, wash wound, fan patient, deliver baby, put blanket on burn, Heimlich manoeuvre.

When asked what would make them more likely to help someone suffering a medical emergency, most focus group participants said that they would be more likely to help if they had the knowledge and skills required to help in the given situation, and if they had the necessary protective equipment (42%).

The second most common response was that stronger community relationships would also encourage helping (36%). Another theme was that participants would be encouraged to help if the emergency care system was improved (18%). Participants wanted to know that they could call for help, an ambulance would come, that the patient would receive appropriate care in the healthcare facility, and that they would not be held legally or financially responsible for helping another person. 2% of responses indicated people would be more likely to help if they personally had a car or had more money.

*“I think people who help more if they knew what to do, so they need to be trained on First Aid or lifesaving courses.” - Nairobi, Urban*

#### **4.9 Barriers to Emergency Care in Kenya**

##### **Cost**

The single most commonly referenced barrier to care was the high cost of medical treatment (15%). This was particularly evident when participants spoke of private

facilities, which were regarded to provide higher quality emergency care, as referenced above, but cost substantially more than government facilities.

*“In private hospitals they are very good and quick with emergencies but they want money which we don’t have. In public hospitals people die in the queue waiting and nobody consider you.” - Nyanza, Rural*

#### *Poor emergency care system*

The most common theme was that structural elements of the current emergency care system made it difficult to access emergency care (34%). The second most common individual barrier referenced was long queues at healthcare facilities and a lack of triage or prioritization protocols, causing critically ill patients to wait a long time before being seen (12%). Two other important barriers in this category are a lack of sufficient healthcare providers at facilities to adequately care for patients and a lack of material resources at facilities, including critical medications. Additional barriers referenced include difficulties with communication such as non-functional emergency phone lines, prolonged admitting time due to paperwork before emergency care is provided, a poor medical records system, and an overall lack of leadership by the government in managing the healthcare system.

*“You may have a patient you took from home as an emergency then when you get to the hospital you find a long line and nobody is willing to assist you. So they can even die in line waiting to see the doctor and nobody cares.” - Nairobi, Slum*

#### *Transportation*

20% of barriers to care referenced can be grouped in the theme of transportation barriers. The third most common individual barrier was difficulty with obtaining transportation to get the victim to a healthcare facility (10%). Other transportation barriers include insufficient healthcare facilities leading to long distances required for travel. A lack of emergency care after business hours and poor road infrastructure were also cited as barriers.

#### *Healthcare providers*

Healthcare providers themselves were seen as a substantial barrier to care (16%). Participants felt that many healthcare providers were unfriendly towards patients or unmotivated to provide timely, appropriate care. Participants were also concerned about corruption; many felt that they were sent by physicians to physician-owned pharmacies to buy medications that were unfairly priced. They also referenced physicians leaving the hospital during their working hours to work at private clinics

Participants felt that in general, healthcare providers are untrained in the basics of emergency care, and that in many emergency situations they would actually be receiving care primarily from students. In general, they felt that healthcare facilities are usually unable to provide care at the level required by the patient.

#### *Initial care on scene*

Nine per cent of the barriers referenced pertained to initial care at the scene of an accident or illness. Participants felt that police were a barrier to care when they were required to bring accident victims to the police before bringing them to the hospital. They also felt that the individuals assisting during an emergency were often untrained and did not know how to properly care for the patient. Participants thought that communities as a whole do not have sufficient knowledge about medical emergencies and what to do when one occurs. Additional barriers included fear of helping or of police, the presence of looters at the scene of an accident, difficulty extricating a patient from an accident, and general chaos at an accident.

*“I realized that not many people know how to handle injured people, because the way they were being handled added more injury to them.” - Coast, Urban*

*“Community is not aware of emergencies and how to deal with them so at times people just stand and stare.” - Coast, Rural*

#### **4.9.1 Factors that make it easier to access emergency care in Kenya**

In the Kenyan focus groups, a question was added regarding factors that make it easier for community members to access emergency care.

#### *Patient factors*

The most common response was that specific qualities of the patient make accessing emergency care easier (38%). Participants related that they had an easier time accessing emergency care when they were dressed nicely, had a good attitude and were patient, had personal financial resources or insurance, and personally knew healthcare providers at the facility or were in the healthcare profession and were given professional courtesy.

*“My brother told me that if you want to be treated well and survive in Kenya, you need to shave neatly and wear a suit, you will be attended to very fast if you have an emergency.” – Western, Rural*

*“Once you give them a bribe they are very quick to help emergency or not. They can even stop taking their tea to assist you.”- Nyanza, Rural*

#### *Ease of transportation*

The second most common factor that participants felt improved their access to emergency care was ease of transportation (27%). They said that if transportation was available when they needed it, they were close to a healthcare facility, they had a phone for communication, and the roads were clear and the weather was favourable, it was much easier to access care.

#### *Choose best facility*

23% of the responses referred to choosing the best healthcare facility. Participants felt that their care was better if they went to a private facility. They also related that having a good provider available to help and the necessary drugs and equipment stocked at the facility significantly improved their emergency care. Additionally, participants felt that it was best to arrive at the healthcare facility early in the day.

#### *First aid*

Other responses referred to having first aid knowledge, having a first aid kit, and being part of a strong community that would immediately respond to an emergency as improving access to emergency care (11%).

### **4.10 Community-Identified Solutions in Kenya**

The final segment of the focus group involved asking participants what they felt should be changed in order to improve their access to emergency care.

#### *Improve structure of emergency care system*

Many of the recommendations that community members had on how to improve the emergency care system in Kenya involved improving the structure of the system at a national level (26%). The fourth most common individual response was to improve material resource availability at all levels, from the community level to large hospitals (8%). Participants wanted gloves so they would feel more comfortable caring for others, and they wanted first aid kits in their communities in central locations such as schools. They also wanted their hospitals to be equipped for emergency care, and to stock the medications that healthcare providers prescribed for them.

Participants also felt that there should be improved government leadership. They wanted the government to pay healthcare providers better, manage healthcare facilities to reduce corruption, and take steps to improve the care and equipment at healthcare facilities. They also felt as though the government should place more emphasis on emergency care.

In the healthcare facilities themselves, participants thought there should be improvements in the patient flow. They would like to see a separate emergency care area in facilities where emergent patients would be prioritized and wouldn't have to wait in line for care. They wanted care for emergent patients to occur before reporting the incident to police, before filling out paperwork, and before collecting payment from the family. They also wanted to be treated by licensed providers instead of students. Additionally, participants felt like the referral system should be improved so that they did not need to go to multiple hospitals, and wait at each one, before arriving at a facility that could treat them. One participant felt that there should be benches in all waiting areas so patients could sit down.

Communication was another area of concern. Participants felt that there should be one emergency line for all of Kenya that they could call when having a medical emergency, and they thought the line should always work and should assist them to get transportation and to get to the correct medical facility. In addition, participants wanted to see faster ambulance responses to emergencies, and faster treatment of emergent patients at healthcare facilities. They also felt that police should assist more with medical emergencies.

Participants felt that the government should make regulations that prohibited healthcare providers from accepting bribes from their patients, and from ignoring critical patients. Participants wanted to feel that the government was holding healthcare providers accountable for their level of care. This would also decrease the corruption that participants felt was occurring at healthcare facilities. Participants also wanted laws requiring emergency medical care to be provided before other concerns (such as accident reports or payments) and laws requiring equal treatment for all people.

*“If there was a separate emergency section it'd help as opposed to being made to queue with everyone else.” - Coast, Rural*

*“There should be communication between the county and the government concerning the salaries of the doctors. Because you may find a hospital having every equipment needed but there are no doctors to handle the emergency. Sometimes when the doctors go on strike, that is when you find the many emergencies and doctors are not there.” - Rift Valley, Urban*

#### *Improve healthcare providers*

Another significant theme was that access to emergency care could be improved by improving healthcare providers (25%). The most common individual response was

related to healthcare providers. Participants felt that the numbers of healthcare providers should be increased, and that healthcare providers should be specifically trained in emergency care (13%). Some even specified that healthcare facilities should have dedicated doctors to provide emergency care. Others felt that healthcare providers should improve their attitudes towards patients, and this could be accomplished by paying providers more or by having stricter regulations on their work duties. Specific areas where participants felt there should be more regulations included not allowing doctors to accept bribes or to treat patients differently based on their ability to pay, and to not allow doctors to work at private clinics when they should be working at the hospital. Finally, some participants wanted to see healthcare providers from different tribes working at healthcare facilities.

*“In hospitals, we should have people who are specialists and are only there to respond to emergencies so that we do not have cases where upon arriving with a patient you find that the doctor has gone to theatre. Because emergencies are unpredictable, at least if we had those specialists for immediate response it would help.” - Rift Valley, Urban*

#### *Improve transportation*

Transportation and physical access to healthcare facilities was another area where participants felt there should be improvement (25%). Participants wanted to see increased access to healthcare facilities by either increasing the number of healthcare facilities, having mobile clinics or outposts in the more remote areas, or increasing the hours that healthcare facilities are open to allow for emergency care at all hours of the day.

Participants also felt that transportation should be improved, and thought that increasing the number of ambulances could be a way to address this. Other suggestions for improving transportation included mending impassable roads and numbering houses for easier ambulance dispatch.

#### *Community capacity building*

As an individual response, community capacity building was the second most commonly referenced (16%). Participants wanted to see emergency care capacity building at the community level. They predominately wanted community first responder training, so that many community members would be appropriately trained and feel comfortable caring for their neighbours when emergencies occurred. Participants also felt that apart from dedicated first aid training, communities should also have general “emergency awareness” classes that taught everyone how to

recognize medical emergencies, who they could call, and how they could be helpful (even if they didn't know first aid). Another common idea was to revive or restore the role of community health worker, so people would have a healthcare professional located in their own community where they could seek medical advice and acute stabilization in the event of an emergency. One participant wanted to see community education related to beach and water safety. Participants felt that if their communities were stronger, they would be more likely to help one another during medical emergencies.

*“Sensitisation should be done. Very few people are aware of how to act in case of emergency.” - Coast, Urban*

*“I think first aid should be taught to people in the community. Learning basic first aid skills would help because sometimes people fail to help due to lack of knowhow.” - North Eastern, Rural*

#### *Decrease cost of care*

Many participants also wanted to see decreased costs of healthcare treatment (6%). This included cheaper medications, cheaper options at private hospitals, assistance with mortuary fees, and increased insurance coverage. Participants thought that the government should be subsidizing healthcare.

*“The government needs to have a system so that if you have an emergency and you go to any hospital public or private it's free and they shouldn't have a money first approach.” - Nairobi, Urban*

## CHAPTER 5

### Discussion

#### 5.1 Introduction

The integration of emergency care into existing healthcare systems is critical when considering the increasing burden of acute disease on LMICs.(49) In order to effectively provide emergency care to a country, some capacity for emergency care should be available at every level of the healthcare system.(45) Before implementing any interventions to improve emergency care systems, government officials need data detailing the current need for emergency care and the current status of emergency care in their country.

Although a few studies have attempted to determine the burden of traumatic disease or the functionality of healthcare facilities in sub-Saharan Africa, there have been no studies that have directly asked community members to identify areas of need and prioritise interventions to improve their access to emergency care.

This study is the first to ask community members for their input on improving their emergency care system. In order to do this, this study sought to determine the current pattern of out-of-hospital emergency care delivery at the community level, to identify the communities' experiences with emergency conditions and the barriers they face when trying to access care, and to discover community-generated solutions to the paucity of emergency care in both urban and rural settings.

It is important to note that the participants in this study had no knowledge that their governments were planning interventions to improve emergency care. They were simply asked to participate in a discussion about emergencies and access to emergency care. When facilitators asked for suggestions on how to improve access to emergency care, they did not provide the participants with any examples. All ideas described in Chapter 4 were generated exclusively by the participants, which strengthens the resulting recommendations.

In this chapter, the results from the Zambian and Kenyan community focus groups and the healthcare provider focus groups will be discussed together, as the findings were very similar. The few differences that did occur are highlighted. Additionally, there were no major differences found between the individual provinces, or between the rural and urban focus groups.

These results indicate that there is a need for a wide range of interventions: local and national, simple and complex. Focus group participants identified what they felt to be necessary interventions at all levels of the healthcare system, beginning with their communities and local healthcare facilities and stretching all the way to national policy. And while some of the proposed solutions require substantial financial investment, the most frequently suggested solutions are also the most low-cost: those that prioritise education in first aid for community members and in basic emergency care for healthcare providers, and implementing triage protocols at existing healthcare facilities.

## **5.2 Community Exposure to Medical Emergencies**

### *Understanding of medical emergencies*

Community members in both Zambia and Kenya had a relatively good understanding of what a medical emergency is. These responses show that participants think of medical emergencies both in terms of the care they require (e.g. rapid care at the scene of an incident) and in terms of the condition itself. Participants also provided insightful modifiers such as “unexpected” and “sudden”. In Kenya, there appeared to be some confusion on whether a medical emergency was a medical condition or whether it was the act of providing care. But in general, community members seemed to understand the life-threatening and critical nature of emergencies. This is important for the data that resulted from the focus group discussions that followed, as it demonstrates that these community members can provide reliable information about their own experiences with emergencies. It is also important to keep in mind when planning interventions.

Unsurprisingly, Zambian healthcare providers demonstrated an even better understanding of medical emergencies. In each group, respondents identified medical emergencies as being “life-threatening” and needing “rapid or immediate intervention”. Other responses were that medical emergencies “occur suddenly” and are “unforeseen”.

### *Exposure to medical emergencies*

In Zambia, 69% of community focus group participants had personally witnessed at least one emergency, as had 70% in Kenya. Numbers were also similar for those who had witnessed three or more emergencies: 39% in Zambia and 34% in Kenya.

In both countries, a high percentage of focus group participants had witnessed at least one medical emergency. While there may be some selection bias due to the nature of convenience sampling for focus groups, it is likely that these results represent a true high rate of community exposure to emergencies. This is another piece of data that highlights the need for emergency care in these communities, adding to the information presented in Chapters 1.1.2 and 1.1.4.

#### *Types of emergencies experienced*

In Zambia, the most common emergencies referenced by community members were trauma (16%), emergencies related to labour or pregnancy (11%), seizures (8%), wounds and fractures (7%), syncope (6%), burns and lightning (4%), and snakebites (4%). When grouped by categories, medical emergencies (38%) were the most frequently mentioned, followed by traumatic (36%) and obstetric (11%). Children were involved in 15% of emergencies.

In Kenya, the most common emergencies referenced by community members were road traffic accidents (16%), assaults (7%), burns (6%), loss of consciousness (6%), emergencies related to labour (6%), blunt trauma (5%), difficulty breathing (5%), traumatic bleeding (4%), and overdoses and poisonings (4%). When grouped by categories, traumatic emergencies (56%) were the most frequently mentioned, followed by medical (31%) and obstetric (10%). Paediatric emergencies were not coded as a specific type of emergency in the Kenyan data.

While communities in both countries reported medical and obstetric emergencies in similar frequencies, the number of traumatic emergencies reported in Kenya was much higher. One potential explanation for this finding is that there truly is a higher burden of traumatic emergencies in Kenyan than in Zambia. However, there are several other possibilities, and 2010 data from the Global Burden of Disease group suggests that the overall burden of injuries in Kenya and Zambia are very similar.<sup>(135)</sup> Kenyan communities could be more concerned about traumatic emergencies, and therefore more likely to talk about them. Also, the nature of focus group discussions causes others in the group to give answers based on what they have heard from their peers. If Kenyan focus groups were more inclined to participate in group discussions and one person mentioned a traumatic experience, this would have made trauma more salient to others in the group and they may have carried on with that theme.

There are not much existing data on the burden of acute illness and injury in Zambia, and what there is comes from trauma patients exclusively, so there is no way to

compare the perceived burden of traumatic injuries and non-traumatic illnesses. At the University Teaching Hospital in Lusaka, the primary teaching hospital for the country, an observational study of trauma patients found that the most common injuries resulted from falls, RTIs, and assault.(55) At Lusaka University Hospital, almost half of all trauma presentations were due to RTIs, and the other half were due to interpersonal violence.(56) Another study reported epidemiology of burn patients in Eastern Zambia, but did not compare the prevalence of burns to other types of trauma, or to acute illnesses.(57)

There are slightly more data on the burden of acute illness and injury in Kenya. In Western Kenya, the most frequently reported emergent and urgent conditions at 30 health centres and dispensaries were malaria (100%), diarrhoea (87%), upper respiratory infections (80%), skin infections (60%), sexually transmitted infections (50%), pneumonia (47%), and RTAs/trauma (30%). At primary and secondary hospitals, the most frequently reported emergent and urgent conditions were: malaria (100%), diarrhoea (73%), sexually transmitted infections (70%), pneumonia (70%), RTAs/trauma (60%), and upper respiratory infections (53%).(65) While this information does not correlate to the reported emergencies experienced by community members, the data were gathered in a completely different manner. This study asked healthcare facilities if they experienced a list of pre-determined emergent and urgent conditions, some of which might not constitute true emergencies. This is a very different approach than asking community members what emergencies they experience. Our focus groups did not use a pre-determined list, and thus relied on community members to recall emergency conditions based on their own experiences. Also, many emergencies experienced in the community do not present to healthcare facilities at all, either due to community members not choosing to seek care, or not being able to reach a facility.

Other studies in Kenya looked only at the burden of traumatic injury. At Kenyatta National Hospital in Nairobi, the main government hospital in the country, 68% of injuries were reported to be due to RTIs, while 30% were due to interpersonal violence.(56) In a rural hospital north of Nairobi, the main mechanisms of injury included road traffic accidents 52%, fall 22%, assaults 13%, and burns 6%. The main injuries reported were limb fractures, soft tissue injuries, head injury and haemo/pneumothorax.(68) The high incidence of RTIs and assaults reflects the data gathered from Kenyan community members, who most commonly referenced RTIs and assaults as well. RTIs are clearly a significant contributor to the burden of traumatic injury in Kenya, and as traumatic injuries may be more salient in their

minds, it makes sense that community members would describe RTIs when asked to recall an emergency. It cannot be determined from this data, however, how the burden of injury relates to the burden of other acute illnesses.

#### *Location of emergencies*

In Zambia, community members recounted emergencies occurring in the home, where children play, on farms, in the field, in the bush, on public transportation, at work, at the market, at school, and at sporting events. In Kenya, emergencies were reported to occur in similar locations: at home, at schools, at work, on the sports field, and on roads.

The very nature of emergencies is that they can occur in any place, and at any time. Community members must therefore be prepared to deal with emergencies occurring in any location. Many emergencies occur in the privacy of the home, at work, or at school, which is unsurprising considering that people spend the majority of their time either at home or at work and school. Emergency care interventions should take this into consideration, as the initial response to an emergency must, by necessity, begin with the members of a community.

#### *Transportation*

In Zambia, participants referenced private vehicles being used to transport patients to healthcare facilities most frequently (22%). Bicycles (17%) and taxis (16%) were also commonly referenced, as were walking (12%) and ambulances (8%). As the “private vehicle” category does not specify whether the private vehicle was hired or not, it is not clear whether money was required for this mode of transportation. It is also unclear whether bicycles were commonly owned, rented, or borrowed.

One study on trauma in Lusaka investigated the ways patients arrived at the hospital. The majority of patients were transported by private vehicle (51.8%) or by public transportation (37.1%). Only 5.8% arrived by emergency transportation services.<sup>(55)</sup>

In Kenya, private cars were also the most frequently referenced means of transportation (31%). Motorcycles (17%), ambulances (15%), and taxis (14%) were also common. Again, it is unclear how often money was required for transportation, as this question was not specifically asked.

Investigation of RTI patients presenting to a rural hospital north of Nairobi revealed that the main methods of transportation to the hospital were taxi or other private vehicle (89%), police vehicles (6%), and ambulances (3%).<sup>(67)</sup> Another study in

Nairobi at Kenyatta National Hospital found that most RTI patients were transported to the hospital by private cars and taxis (75%).(69)

Ambulance use in these countries is interesting, as they are neither one of the more frequently used methods of transportation, nor are they entirely absent from communities. When thinking about ambulance transportation, however, it is important to remember that in most cases these ambulances function no better than a private car or a taxi. Very few of the ambulances have attendants who are trained to provide emergency care, and they are not equipped for this purpose.(24,25,35) In fact, waiting for an ambulance, rather than taking the most immediately available form of transportation, may hinder emergency care in some situations by delaying time to definitive care. This study initially attempted to understand how long it took community members to find transportation and to reach a healthcare facility, but focus groups are not the best method for obtaining this quantitative data. In order to intervene on transportation barriers, however, it would be beneficial to have an idea of how long it takes community members to reach the healthcare facility with various modes of transportation.

#### *Where participants seek care*

As explained in Chapter 4.2, the question about where participants seek care was not the most successful in determining whether community members would choose a specific healthcare facility or head to the nearest facility. However, 25% of responses referenced going to the “nearest” facility, and more participants said that their choice of facility would depend on where they were. This information may indicate that many community members understand the time-critical nature of an emergency, and decide to seek care from the nearest facility instead of bypassing facilities to seek care at a facility they may feel is “better”. As a result, it may be perceived that local clinics providing lower-level care are in fact the first-line of emergency care in Zambian communities. This has implications for where focus should be placed when strengthening the emergency care system. If most community members are presenting first to their local clinics with acute illness and injury, these clinics should be staffed by providers trained in basic emergency resuscitation and stabilisation, and they should be properly equipped with the necessary supplies as well.

Additionally, only 8% of respondents said they would seek care during emergencies from traditional healers, traditional birth attendants, or “witch doctors”. It can therefore be extrapolated that most community members seek care from healthcare providers for medical emergencies. However, there do appear to be some

community members who would choose traditional remedies when suffering an emergency, so this topic will be important to explore further in community training sessions. In any community where emergency care interventions are being implemented, it is important to understand if some community members prefer to seek care from traditional healers, and if so, why. If there are community members who prefer to seek care from their traditional healer, there may be an opportunity to train the traditional healer in basic first aid. In this way, the traditional healer could become an asset for community members during emergencies, and the intervention would be building upon existing healthcare structure.

It should also be noted that 14% of responses mentioned seeking care at a government facility specifically. These focus group participants were not probed further to determine if they would avoid seeking care at a military camp, but that is one potential interpretation. It is unclear, however, whether this specification refers to preferring government facilities to military, or government facilities to private. Again, this is an important topic that should be clarified when implementing community-based interventions. Due to the ambiguity in the data related to this question in Zambia, it was removed from the focus group script in Kenya. However, in Kenya focus group participants were very eager to point out that while they often sought care at government facilities due to cost, private healthcare facilities were more likely to provide emergency care, and you would be seen faster at a private facility. This implies that there are some healthcare facilities in Kenya that are providing emergency care, but that this care is not available to the majority of citizens due to prohibitive cost.

### **5.3 Assistance and Willingness to Help**

In Zambia, family members of the patient and community members were most likely to provide assistance during an emergency; together they were referenced as providing assistance more than two-thirds of the time. In Kenya, bystanders, family members, and community members provided more than two-thirds of the help mentioned. When classmates, colleagues, and friends were added to this grouping, laypersons in the patient's immediate or extended community provided 89% of the help.

Community members are clearly already providing assistance to one another when medical emergencies arise, and this information suggests that patients are much more likely to be helped by someone from their community or a Good Samaritan than

by a first responder or medical provider. There are two implications that can be drawn from this observation. Interventions could focus on improving the number, distribution, and dispatch of first responders to they can assist those in need, or they could target community members and provide them with the education and tools needed to better do a job they are already attempting.

In Zambia, 85% of participants said they would help someone suffering an emergency; 84% said the same in Kenya, and 67% had already helped in the past.

A few studies on RTIs in Kenya have demonstrated this willingness to help. In one, extrication of the injured from RTIs was performed by members of the public (bystanders) the majority of the time (65%) (other patients were extricated by ambulance (2.8%) and military medical personnel (6.2%)). Yet this assistance was only with extrication from the vehicle or transport from the scene: 92% of surviving patients had no medical interventions instituted before arrival at the hospital.(69) These findings are consistent with other similar studies.(70)

The most common reason that Zambian participants gave to help another person was a shared sense of community. They feel a connection with their neighbours, and would want to provide assistance both out of compassion and because they would want to be helped if they were in need. In Kenya, feelings of moral obligation were also the most commonly cited reason to help, but respondents' answers were more inclusive. Kenyan participants mentioned 'community' less often, and instead talked about compassion, empathy, and mercy for patients in general. This may represent a more inclusive propensity to help, as Good Samaritans were most frequently referenced as providing assistance in Kenya. However, Kenyan participants may also think of their communities when they picture themselves helping, yet not specify this out loud.

Both Zambian and Kenyan participants also said that they would help if they had the necessary training, knowledge, or resources.

One of the most noticeable country differences between responses occurred when participants were asked reasons why they might not help in an emergency. Zambians would not help due to lack of knowledge about the emergency and how to help, lack of transportation, and lack of equipment. Kenyan community members, however, gave many more reasons: the most common theme (which was also referenced in Zambia) was a concern that they would personally be inconvenienced or harmed. Participants were worried about harm both due to the nature of the emergency itself, such as putting themselves in a dangerous situation, and due to

the current legal system that might hold them responsible for the patient. The second most common theme in Kenya matched responses from Zambia, that a lack of knowledge or a lack of personal protective equipment would prevent someone from helping. This is consistent with other studies that have shown a lack of knowledge and fear of hurting the patient more discourages community members from helping.(136)

It is important to understand why community members may not feel comfortable helping, as bystander non-intervention is a common occurrence in emergencies.(103) It is important that community members feel comfortable assisting others, and that they can do so while keeping themselves safe. Some of these safety concerns can be addressed in training courses, such as concerns specific to the accident or emergency itself. Other concerns, however, can only be addressed through a larger, systemic intervention. Government intervention is necessary to address legal concerns; the current laws and practice need to be changed so that people can feel comfortable helping others in need.

The concerns about a lack of knowledge on what to do in an emergency and how to properly care for a patient can undoubtedly be addressed through training.(136) Providing first aid training to community members would allow them to identify patients who are critically ill and injured, and would give them the information they need to provide basic stabilisation and transport.

Zambian community members overwhelmingly felt that they could help another person by arranging or providing transport to the hospital. The second most common response was that they would assist by providing first aid. In Kenya, respondents said they would provide medical care most frequently, followed by providing transport. Kenyan community members also mentioned getting help from the police, an ambulance, or medical providers in the community.

When asked what would make them more likely to help, both Zambian and Kenyan participants overwhelmingly felt that they could better help if they had first aid training. Two other common responses were that they would be more likely to help if they had a means of transportation and if they had personal protective equipment.

Several common themes emerged in both Zambian and Kenyan discussions about willingness to provide assistance. Community members from both countries are exceedingly willing to help others who are suffering a medical emergency: laypersons from within and outside of the patient's community are the most likely to provide assistance during an emergency. The themes of first aid training and

transportation came up frequently in discussions about willingness to help. Community members currently assist one another by providing first aid and transportation, they feel that these would be the best ways to provide assistance in the future, and they would be more likely to provide assistance if they received training and had the necessary resources needed to perform these tasks.

Additionally, these interventions would alleviate many of the concerns that community members feel would make them not want to provide assistance during an emergency. First aid training would teach community members what to do in such circumstances: how to provide medical care for the patient, how to obtain basic necessary equipment, and how to protect yourself from both infectious hazards and hazards related to the scene. Additional training could also focus on how to obtain help in an emergency, knowing the available resources and how to activate them. Discussions about available resources could include brainstorming about the available modes of transportation, and how to reliably and rapidly obtain transportation during a medical emergency.

While discussions on how to obtain transportation might be beneficial, the community may not be able to do enough to address their need for transportation, and a higher-level intervention may become necessary. Other major concerns that would not be addressed by community training are the legal and financial repercussions suffered by those who provide assistance during an emergency.

#### **5.4 How Emergency Care is Currently Delivered**

We asked healthcare providers how emergency care is delivered at their healthcare facilities in order to gain a better understanding of what happens to acutely ill and injured patients when they arrive.

Many providers said that their facility would need to call in the emergency staff on call. While some said that their facility was open to emergencies 24 hours a day, the necessary staff was often not in the building. Facilities did not always have a dedicated emergency bay, and even if it was present, it was not necessarily equipped for resuscitation. Most providers responded that the patient would be assessed first, and then transferred to another facility. Fewer providers mentioned that the patient would be initially stabilised before transfer to the higher-level facility. Providers from Central Province discussed a communication system that allowed them to alert the receiving hospital prior to the patient's arrival.

In general, Zambian healthcare providers felt that the emergency care system in Zambia was poor, and that it was too centralised. The majority of emergency care is only available at the large, central referral hospitals, yet patients present to the small clinics and district hospitals initially when they are acutely ill or injured. This information suggests the need for several interventions. If the majority of emergent patients are presenting to small clinics and district hospitals, these facilities should be appropriately equipped to manage acute illness and injury. This would include having staff trained in resuscitation and stabilisation, having protocols for emergency care, and having the proper equipment available. Additionally, if the majority of emergent patients are transferred to a higher level of care, the referral networks must be strengthened. Two major barriers to safe, effective patient transfer seem to be transportation and communication. Smaller healthcare facilities need to have reliable means of transportation to send patients safely to a higher level of care, and this transportation should include a basic care provider who has been trained to manage patients between facilities. Patient care could also be improved by creating a system and a protocol for pre-alerting the receiving facility of the emergency, and providing basic information about the patient such as the nature of their injury and illness and any resources the patient might need upon arrival. Educating community members about emergencies could also assist the referral pattern by giving them the information they need to make informed decisions about where to seek care. They may avoid higher-level facilities in an emergency due to concerns about bypass fees, but if community members could accurately identify life-threatening emergencies and had the option of proceeding immediately to a higher-level facility, this could decrease the time to definitive care.

Zambian healthcare providers were also asked about any potential differences between military and civilian emergency care access at their facilities. This is important to ascertain, because many of the lower-level healthcare facilities in Zambia are run by the ZDF, and in some rural areas a military clinic may be the only option for an acutely ill or injured civilian.<sup>(26)</sup> Most providers responded that military personnel and civilians would access care in the same manner regardless of what facility they were at. There may be some differences in long-term care, mostly related to the financial status of the civilian, but initial emergency stabilisation would occur regardless of ability to pay. The only potential barrier identified for civilians trying to access emergency care at a military facility was the main gate. As the healthcare providers are stationed within the base inside the healthcare facility, they do not see what happens at the gates. The guards require identification for access, but most

participants said that identification would not be a problem if the patient were “critical”. This leaves the identification of “critical” patients entirely up to the guards, however. It is easy to imagine that a patient who was unconscious and bleeding from a RTI would be let through the gates without hassle, but a patient having an acute myocardial infarction or respiratory distress might be detained for lack of identification.

One potential way to alleviate this barrier would be to train the guards at the gates in first aid. If they were able to recognise emergent signs and symptoms, they would be better equipped to identify which patients need to get to the healthcare facility immediately, and who cannot afford to be detained at the gate. The providers in the healthcare facility could also write a protocol for the gate guards to help them identify which patients should be immediately let through. In this way, the gate guards would be performing a form of triage, and would hopefully avoid detaining patients who are critically ill.

## **5.5 Barriers to Emergency Care**

While community members in both countries and healthcare providers in Zambia placed different levels of emphasis on different barriers to emergency care, most of the same themes emerged in all of the focus groups.

Beginning in the community, several factors contribute to an absence of initial care at the scene of an acute illness or injury. Neither professional first responders such as the police nor general community members are trained in the initial stabilisation and transport of emergent patients. While community members often want to help their neighbours, a lack of basic first aid knowledge can cause anxiety and trepidation, and is a large barrier to providing assistance. With police officers and other professional first responders, a lack of knowledge can cause officers to mistakenly neglect the acuity of a patient and cause unnecessary and deleterious delays in care. Ignorance can also cause mishandling and further injury to the patient at the scene. Additionally, a lack of knowledge on the part of the community as a whole can cause emergencies to go unrecognised for too long, and when they are recognised, can prevent community members from making the best use of their resources to assist the patient in receiving lifesaving care.

In the field of emergency obstetric care, a conceptual framework was developed to describe the three phases of delays influencing maternal mortality. This “three delays” model identifies barriers to the provision and utilisation of effective, timely

obstetric care.(137) Emergency care can also be conceptualised in relation to delays, as effective emergency care relies on timely recognition and stabilisation of life threatening conditions. Delays in treating acute injury and illness such as sepsis result in increased morbidity and mortality.(40–42) The first delay the “three delays” model is a delay in the decision to seek care.(137,138) Community knowledge, or a lack thereof, is a major barrier to the decision to seek care.

It is difficult for community members to even reach emergency care for multiple reasons. There are not many healthcare facilities, especially in rural areas, so patients have to travel long distances to reach care. This is compounded by the fact that transportation is often simply not available. It can take a long time to secure a means of transportation, which usually costs money that the patient may not have. All of these factors combined with poor road quality contribute to long delays between the decision to seek care and arriving at care. In terms of the “three delays” model, transportation barriers are best described as the second delay, a delay in reaching care.(137)

Another contributing factor to the delay in reaching care is the absence of a pre-hospital system in either country. Both countries have a few ambulances, but they are not part of a unified system, do not provide any pre-hospital care, and there are not sufficient numbers to adequately provide for the population. There are many aspects missing from these pre-hospital EMS systems such as ambulances, trained personnel, and equipment. But the lack of a communication system is also detrimental, even to the rudimentary ambulance transportation that is occurring at present. Neither Zambia nor Kenya have a universal emergency number, one that is known by all citizens and is always functional. Without this, community members are not able to request emergency help when needed.

When emergent patients finally arrive at a healthcare facility, they are further hindered by inadequate or non-existent emergency care. Upon arrival, there is often no triage or prioritisation system, and acutely ill and injured patients are made to wait in the queue with other, less urgent patients. These queues are often long due to few providers and many patients, and participants recounted several stories of patients suffering negative events in queues from lack of appropriate attention. Additionally, few facilities have a dedicated room to resuscitate and stabilise emergent patients, and they lack the basic equipment necessary to do so.

Throughout many different communities in two separate countries, community members often made reference to the ‘poor attitudes’ of healthcare providers. It is

interesting to note, however, that most participants attributed the negative attitudes to a greater failing in the healthcare system as a whole, and not to the individual providers. Participants described a shortage of providers at healthcare facilities leading to a critical lack of manpower, and the poor compensation that providers receive from the government, causing them to seek additional employment elsewhere. Additionally, many community members voiced concerns that healthcare providers have not been specifically trained in emergency care.

The current referral system in both Zambia and Kenya is also a major barrier to care, and is recognised by community members and healthcare providers alike. There is a disconnect between where emergency care is commonly provided and where acutely ill and injured patients first present to the healthcare system. Patients generally present to their closest healthcare facility due to difficulties with distance and transportation, and in some cases due to a fear of penalties and fines for skipping their primary clinic in favour of a higher-level facility. Yet the large referral hospitals are usually the only ones equipped to provide any sort of emergency care. Critically ill and injured patients are referred immediately from the peripheral facilities to the referral hospitals, but they are often referred without any initial stabilisation. And when they are referred, they are usually not provided with any sort of transportation, placing an increased transportation burden on the patient and family. Furthermore, the receiving hospital may be unprepared to receive the emergent patient, as there is often no communication between healthcare facilities when referring a patient to a higher level of care. A lack of initial emergency care at clinics and district hospitals combined with an absence of a pre-hospital system to provide care during transportation and poor communication causes significant additional delays to receiving emergency care.

Healthcare facilities without a triage system, dedicated space and equipment for emergency resuscitation, properly trained healthcare providers, and a timely, effective referral system all contribute to a delay in receiving adequate emergency care. This is the third delay in the “three delays” model.(137)

Overall, both community members in Zambia and Kenya and Zambian healthcare providers were concerned by the general absence of an emergency care system. There are few regulations on providers, especially relating to training and proficiency in emergency care, and there are no ‘standard operating procedures’ (SOPs), or detailed protocols designed to achieve optimal care for a variety of emergent conditions. Community members want to see the government train providers in emergency care, and providers want training as well as SOPs and an overall system

in which to practise emergency care. This includes professional organisations. Both groups feel that emergency care should be available in some capacity at all facilities, from the smallest clinics to the tertiary referral centres.

Interestingly, the most referenced barrier to care in Kenya was cost of care, and this was not even mentioned in Zambia except when referring to transportation. In Kenya the concern was mainly regarding the cost of treatment itself. It is unclear from the discussions whether this cost was referring to care at private facilities primarily, or whether participants were discussing high costs of emergency care at both private and government hospitals. It is clear, however, that participants recognise that private facilities are much more expensive than government facilities. It is possible that community members associate emergency care with a high cost because they also associate emergency care with private facilities, and so in order to receive emergency care that they feel is appropriate they seek care at a private facility.

The importance of military bases to the structure of the Zambian healthcare system gives Zambian communities unique barriers of their own. While military healthcare facilities generally treat civilians equally to military personnel, there may be barriers that arise before the patient arrives at the facility. As military clinics are located inside a base, those seeking care must pass through the main gates to the compound. This can cause unnecessary delays, especially at night when the guards may be more vigilant. While the majority of patients will be unaffected by a short delay to check identification at the gate, there are some emergent patients that may be negatively affected. Gate security is of particular concern if they ever turn away patients for being unable to produce identification during an emergency.

## **5.6 Community-Identified Solutions**

When asked for ideas that would increase their access to emergency care, community members identified many practical, perceptive interventions to reduce the barriers they had previously identified. These interventions range from local, community-based programs to policy changes at the national level. The majority of these solutions were identified by both Zambian and Kenyan community members, as well as by Zambian healthcare providers.

### *Community Training*

Participants in all focus groups thought that community training in emergency awareness and response would alleviate many of the barriers faced in the initial pre-

hospital setting. This training could be designed in two modules: one general module on emergency awareness for the entire community, and a second, more intensive module on basic first aid for those community members interested in receiving the training. The module on emergency awareness would serve to educate the community on how to recognise medical emergencies, and thus improve the initial time to seek care. It could also include a section on local resources, such as what phone number to call in an emergency, and who in the community has first aid training and how to reach them. The second portion of the community training would be a more intensive community first responder course for interested volunteers. This course would cover emergency recognition, stabilisation, and transportation. It would also include education on safety, including scene safety and proper infection control techniques. It has been proposed that many of the benefits of a formal pre-hospital emergency care system could be realised by teaching community members basic interventions such as establishing and maintaining a patent airway, controlling external bleeding, and immobilising fractures using available resources.(45)

Community first responder programs have previously been shown to be successful in increasing the emergency care knowledge of community members in African countries.(110–115) Community members in Zambia and Kenya already assist one another during emergencies, and are motivated to help others in the future. The specific first aid training would alleviate community concerns regarding a lack of knowledge on proper emergency medical care, and would also ease concerns about personal safety. With training, community members can be taught scene management and scene safety, as well as how to take infection control precautions. Community first responder training would encourage an individual's propensity to help by making them more confident in their skills and knowledge.(115,136,139,140)

It would also be beneficial to hold community meetings on emergency preparedness, with particular emphasis on transportation. If members of the community brainstormed transportation options in their area, they could identify the resources that would be available in an emergency, and come up with solutions to make sure these transportation resources would be functional when needed. Community first responders would then know how to rapidly find transportation in an emergency. They could even be taught to recognise specific signs that would indicate they should transport the patient to a specific healthcare facility over another.

Another important aspect of community first responder training would be the inclusion of a module on basic equipment necessary for first aid, and how to find this equipment in their community. Many focus group participants wanted first aid kits in

their communities, however this may not be immediately feasible for both logistical and financial reasons. Instead, a better option would be to teach community first responders how to easily locate everything they would need in an emergency, such as using clean cloth instead of gauze.

The community first responder course could also be modified for police officers and military personnel such as gate guards. Both of these groups see acutely ill and injured people as part of their daily jobs, and should know how to appropriately assess and stabilise these patients. Basic first aid training would help police officers who are called to the scene of an RTI or other accident to prioritise patient care and make sure the patient is appropriately extricated and transported to a healthcare facility as rapidly as possible. It would also discourage police officers from delaying an assault victim's access to life-saving medical care in favour of prioritising the criminal investigation. Military personnel would benefit from first aid training in general, as they are also likely to encounter injured people as part of their job. One group who may benefit specifically are the gate guards at military bases. If gate guards were trained to recognise acutely ill and injured patients, they could appropriately decide who to let through the gate and into the healthcare facility without checking their identification. Once trained, these guards could also be a resource for problem-solving discussions. If healthcare providers continue to feel that community members are encountering a barrier when trying to enter the military base to receive medical care, the providers could sit down with the gate guards and brainstorm ways to reduce the barrier for emergent patients while keeping the base appropriately secure.

#### *Strengthening formal pre-hospital care system*

Barriers to care in the pre-hospital setting would also be diminished by strengthening a formal pre-hospital care system. This requires a greater input of resources, but would be the next step after community education towards improving emergency care. Specific interventions in the formal pre-hospital setting could include creating a national emergency phone number, training providers to provide pre-hospital care on ambulances, increasing the number of ambulances in the country and optimising their distribution, using ambulances to transfer patients to a higher level of care, and implementing a transfer protocol that requires communication between facilities about the patient.

Creating a national emergency number could be the first step towards strengthening the formal pre-hospital system, as a functional call system would improve access to

resources that already exist. If there was one emergency number for the entire country, citizens could call the number whenever a large accident occurs, and dispatchers could send available resources, either an ambulance, or police if an ambulance was not available. Dispatchers could also advise callers when ambulances are not available, and when it would be better for the patient to take them to a healthcare facility immediately and not to wait for an ambulance. With a communication system, dispatchers could alert healthcare facilities that they will be receiving an acutely ill or injured patient, and facilities would have time to prepare, which might include calling in providers from home. A study in Sierra Leone demonstrated that equipping remote health facilities and traditional birth attendants with radios linked to referral hospitals can shorten response times and reduce maternal deaths.(141)

Focus should then be placed on increasing the availability of emergency transportation, as there is empirical evidence that providing emergency transportation saves lives.(45,141,142) This does not have to be limited to conventional ambulances; programs using motorcycle ambulances and bicycle ambulances have also been successful in areas such as Malawi and Eastern Zambia.(143)

#### *Re-structuring healthcare facilities*

At the healthcare facility level, many barriers to emergency care could be diminished by re-structuring healthcare facilities to optimise the provision of emergency care. First, triage systems should be implemented at all facilities. Triage categorises a patient's need for medical care, prioritising treatment for those with life-threatening conditions ahead of those who are stable and safe to wait. As there are insufficient providers for the number of patients needing to be seen, a triage system would prevent emergent patients from deteriorating while waiting in a queue. Triage systems are designed to maximise the efficient use of resources, particularly in setting where they are limited, while minimising morbidity and mortality of all patients.(144) There are many existing triage systems that have been designed for both pre-hospital and facility-based settings. One triage system has even been specifically designed for use in the sub-Saharan African setting, taking into account the extensive burden of disease and need for rapid triage times.(144) Studies of this triage system have found that it dramatically reduces the waiting times of critically ill patients at healthcare facilities.(145)

Another important intervention would be the creation of space for acutely ill and injured patients in each healthcare facility. This space could be a designated 'emergency room' in larger hospitals, or could be an individual resuscitation bay or bed in smaller clinics. Having a designated space would help emergent patients get the care they need by placing them in an area designed for emergency resuscitation and stabilisation. This emergency room or resuscitation bay should also be equipped with the basic supplies needed for resuscitation. The necessary supplies would be expected to vary depending on the size of the facility, but all facilities from small clinics to large hospitals should have a core set. At the moment, there are no good guidelines that outline what emergency care supplies should be available at each level of healthcare facility, beginning with small community clinics and progressing to tertiary referral centres. However, a country looking to implement equipment requirements could consult with experts to create their own protocols that are optimally suited to their environment. Proper training in triage and emergency stabilisation combined with a basic set of essential equipment should allow the staff of even the smallest healthcare facilities to manage emergent patients. Patients requiring further resources can then be transferred to a higher level of care after stabilisation.(45)

The hours of smaller healthcare facilities were also referenced as a barrier to care, as emergencies are unpredictable and can easily occur in the middle of the night. If community members only have one local healthcare facility and it closes at night, they have nowhere to seek care if an emergency occurs. If staffing allows, access to emergency care could be improved by having a nurse at the facility at all hours, with a provider that could be called in to assist with emergent patients. Having at least one nurse at the clinic 24 hours a day would be especially important in rural areas where community members cannot easily get to a larger facility.

#### *National policy interventions*

On a national level, perhaps the most important intervention that governments can make is to provide training in emergency care for healthcare providers. This training should be aimed at the providers working in small clinics and district hospitals, as they are often the first to receive acutely ill and injured patients. The training should also include providers working in the emergency intake areas of larger regional and tertiary hospitals, as they will be receiving emergent patients as well. Other studies on emergency care have drawn similar conclusions about the need to train healthcare providers in the basics of emergency care. Recommended topics include basic assessment and intervention of airway, breathing, and circulation; taking and

interpreting vital signs; methodical total body assessment; haemorrhage control; immobilisation and splinting of potential injuries; and a pre-established reliable and rapid referral notification plan.(65) This training would prepare healthcare providers at all levels of the system to appropriately recognise and treat acutely ill and injured patients. As time is critical in an emergency, having providers trained in emergency care would allow patients to get the necessary care more quickly, thereby reducing morbidity and mortality.(40–42,45)

Once healthcare providers are trained in emergency care, national governments could create SOPs for how different levels of facilities should be caring for specific types of patients. These SOPs would need to be created by stakeholders in emergency care throughout the country with expert consultation to make sure that they are context appropriate. Having SOPs at each healthcare facility would be an additional tool to ensure that emergent patients receive the care that they require in a timely fashion.

The creation of some new laws at a national level would also serve to reduce barriers to emergency care. Particularly in Kenya, community members are concerned about helping one another during emergencies because they fear getting involved in a legal case, or being blamed for the incident. Many countries have 'Good Samaritan' laws that protect bystanders who provide assistance to others in emergency situations. If community members felt as though they would be protected from legal harm if they were to assist someone suffering an emergency, they would probably be more likely to do so. Another potential legal intervention would be to allow community members to bypass their lower-level healthcare facility in favour of a higher level of care in the event of an emergency. There is already provision made for this in Zambia, but community members are afraid of incurring a 'bypass fee' if their condition is not judged to be a true emergency. It may be useful for Zambia to look into this situation further in order to determine whether bypass fees are detrimental by discouraging patients from presenting to an appropriate level of care, or whether they ultimately benefit care by reducing overcrowding at higher-level facilities.

The requirement of payment before provision of care is an enormous barrier during an emergency, and governments could easily eliminate this barrier by requiring that all emergent patients be stabilised before any payment is required. This legislation could be linked to the triage system as well, requiring that patients triaged into a specific category be cared for before they are asked for money. This would prevent patients suffering increased morbidity and mortality due to an inability to pay.

Several community members also suggested that governments pay healthcare providers better, as it would encourage them to do their jobs. Focus group participants were concerned that providers were often unavailable because they were working a second job to make more money. The participants felt that if the providers were paid more by the government, they would not need to work a second job and would be present at the government facility to care for patients. Additionally, the motivation and commitment of healthcare workers could be enhanced by improving their funding and support.(146) Hospitals could also be stricter at accounting for the whereabouts of their providers, and implement penalties for providers who leave the facility during their shift.

In general, healthcare systems in Zambia and Kenya could be strengthened by increasing the overall number of healthcare providers in each country and creating additional healthcare facilities. However these interventions require a tremendous input of resources, and are already on the agendas of the governments in each country.(20,34,147) There are several specific interventions that can be implemented in the existing healthcare systems that will have a tremendous impact on access to emergency care while governments work on the larger goal of increasing their healthcare workforce.

One additional idea that Zambian healthcare providers had is to create a national professional organisation for providers interested in emergency care. This organisation would bring together those with an experience and interest in emergency care, and they could share their ideas and experiences from their personal practice. They would also be available to provide consultation to the national government when the government was looking to further improve emergency care.

## **5.7 Limitations of the Study**

While every effort was taken to ensure that the research was methodologically sound, several important limitations need to be considered.

The majority of the focus groups were conducted in Bemba, Nyanja, or Kiswahili. This decision was made in order to facilitate the group discussion, as a majority of the focus group participants did not speak English. In order to maintain accuracy, the focus group script and consent forms were translated from English to Bemba, Nyanja, or Kiswahili by a trained focus group facilitator, then were back-translated by another focus group facilitator. Once the interviews were conducted, the recordings

were translated and transcribed by the facilitators who had conducted the focus group. This was done to increase the accuracy of the translation, as many words in Bemba, Nyanja, and Kiswahili do not directly translate into English. Thus, a person who was present for the discussion would be able to translate most accurately. These translations were checked by another focus group facilitator.

Significant consideration was given to the fact that the investigators themselves did not conduct the focus groups. We chose to utilise the Zambian and Kenyan healthcare providers because we felt that it was crucial to have the focus groups conducted by individuals from the community being interviewed who speak the local language. It would be extremely difficult to conduct focus groups via a translator, as focus groups rely on group dynamics and participation, and it would not be possible for the facilitator to keep up with the conversation when using a translator. Using focus group facilitators from the local community also encourages participants to speak freely and comfortably rather than being intimidated by speaking to a foreign doctor. We did consider whether it would be beneficial to have an investigator present at the focus groups to make sure that the facilitators were conducting the groups consistently in the proper manner. To do this, however, we would have needed an additional translator to sit with the investigator and translate the conversation into English. This real-time translation would be difficult, and at best the investigator would only get a sense of the way in which the clinical officer was facilitating the group. The downside to this would be the actual presence of the investigator in the room during the focus group. There is a distinct possibility that this would make participants feel uncomfortable and discourage them from voicing their true opinions. Therefore, we decided to not have the investigators present for the focus groups. In order to mitigate the limitations caused by this decision, we were rigorous in the selection and training of the focus group facilitators. We also had them conduct trial focus groups in our presences to determine their ability to consistently and accurately conduct a focus group.

Even with strict training of the facilitators, the nature of having multiple different facilitators meant that not every question was asked to each focus group. This was only a problem in Zambia, however, which served as a pilot for the larger Kenyan study. Once the investigators realised what had happened, they were much more explicit in the Kenyan facilitator training session about the importance of following the focus group script.

Finally, in the Zambian healthcare provider focus groups, the participants for two of the focus groups were drawn from the 'fundamentals in emergency care' course

participants. They had previously been exposed to three weeks of training in emergency care and education, so their answers to questions may not be representative of Zambian healthcare providers as a whole. The sample size of healthcare providers was small, however, and their responses were not intended to be representative of the entire country. Rather, the healthcare providers from the 'fundamentals in emergency care' course gave insightful answers that we may not have received from other providers.

## **CHAPTER 6**

### **Conclusion**

The aim of this study was to identify the critical interventions necessary for the Zambian and Kenyan emergency care systems by gathering information about community members' current need for and barriers to emergency care.

Analysis of the focus group data identified several common themes. Community members in Zambia and Kenya experience a wide range of medical emergencies, and they rely on family members, neighbours, and Good Samaritans for assistance. These community members frequently provide assistance with transportation to medical facilities, and also attempt some basic first aid. As these communities are already assisting one another during emergencies and are willing to help in the future, there exists an ideal opportunity to initiate interventions designed at decreasing barriers to emergency care at the community level.

Community members in this study perceptively identified barriers to emergency care related to the multiple components of an emergency care system: a lack of community education, absent or non-functional communication systems, insufficient transportation, no triage system, a lack of healthcare providers trained in emergency care, and inadequate equipment and supplies. After identifying these significant barriers, community members gave insightful recommendations for ways in which their access to emergency care could be improved.

## CHAPTER 7

### Recommendations

The recommendations from this study have been drawn exclusively from the focus group participants themselves rather than from the investigators.

1. Create community training courses and facilitate community empowerment
  - Community training in emergency awareness
  - Community first responder training
  - Community-driven emergency transportation plans
  - First responder training for police officers and military personnel
2. Strengthen the formal pre-hospital care system
  - Create a national emergency phone number
  - Increase emergency transportation options, including ambulances
  - Train ambulance staff to provide pre-hospital care
3. Structure all healthcare facilities to provide emergency care
  - Create a national triage protocol for all healthcare facilities
  - Create emergency rooms and emergency bays specifically dedicated for emergency resuscitation and stabilisation
  - Increase emergency hours of rural clinics when possible
4. Train all healthcare providers in the basics of emergency care
5. Change national policies to improve emergency care
  - Create SOPs for emergency care at different healthcare facility levels
  - Create 'Good Samaritan' laws to protect citizens
  - Critically appraise existing facility bypass laws
  - Mandate the provision of emergency stabilisation before any payments
  - Pay healthcare providers more to encourage better care
  - Create a national society for emergency care providers

#### 7.1 Next Steps

Steps are already being taken to implement the interventions suggested by this study. The results of this needs assessment have been presented to the ZDF and

the Zambian MoH. As a result, members of the ZDF have created a modular curriculum for training community members in basic emergency awareness and first aid. They have also created a more sophisticated curriculum for training military personnel and midlevel healthcare providers to identify and care for acutely ill and injured patients.

A report detailing the results from Kenya will soon be sent to Kenyan stakeholders and used to advocate for and inform targeted community-based solutions for strengthening the Kenyan emergency care system. Advocacy will be aimed at community education initiatives and triage implementation in healthcare facilities.

The focus group training tool and focus group scripts produced by this study will be made available for use in other countries looking to assess the emergency care needs of their citizens. This qualitative tool can also be combined with a more quantitative assessment of facility-based emergency care capacity and the burden of acute disease to provide a more comprehensive picture of the current status of emergency care in a given location.

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## Appendix 1: Zambia Focus Group Script

1. *I'd like to start the discussion by asking what you think a medical emergency is.*
2. *Thank you for your ideas. A medical emergency is any life-threatening condition requiring emergency care. Now I'd like to talk about any emergencies that you have witnessed in the past (for instance breathing problems, chest pain, trauma, birth complications). By show of hands, how many of you have witnessed an emergency in the past? Ok so \_\_\_ out of \_\_\_. How many of you have witnessed more than 3? Ok so \_\_\_ out of \_\_\_.*
3. *Would someone like to start by describing a medical emergency they have witnessed or experienced? (Remember a medical emergency is any condition that requires immediate life-saving intervention)*

### *Probes:*

- *What type of medical emergency was it?*
- *Was someone at the incident able to assist? Who? (Police man, layperson?)*
- *If there was someone at the incident to assist, what did that person do to help?*
- *Did you/the casualty need transport to a health facility for emergency care?*
- *How long did you/the casualty wait for transport? What transport was available?*
- *How long did it take to reach the facility?*
- *What were the challenges when arranging transport?*

Allow as many people to describe their medical emergency and probe only with the above points if they have not already covered this. After each person's sharing make sure to thank them and acknowledge that their contribution is very valuable though it may be tragic or emotional.

Give at least 30 – 40 minutes for questions 1-3

4. *Thank you all for sharing your experiences so far. The types of emergencies you have mentioned include .... (list a summary of what they have shared burns, motor vehicle accidents.....) Are there any other types of medical emergencies that you see most frequently in your community?*

5. *By show of hands – who would help someone during a medical emergency? Ok so \_\_\_ out of \_\_\_ would help someone during a medical emergency.*

*Could you share the reason why you would help? Those that did not raise their hands,*

*could you share the reason why you would not help?*

6. *If you said that you would help during a medical emergency – how would you help?*

7. *What do you think could make you and other people more likely to help?*

8. *Where do you seek care for a medical emergency?*

*Probes: Why? [clarify any perceived barriers]*

9. *Is there anything else you would like to add?*

*Thank you so much for coming and sharing your experiences, thoughts and opinions with us. Some of the experiences you have described involved death and tragedy but they are very important stories for us to work on improving the emergency care services in Zambia. As mentioned before if you feel you would like to speak to one of the facilitators after the session, they will be available. That concludes our focus group session.*

## **Appendix 2: Zambia Healthcare Provider Script**

### **FACILITY INFO**

1. Please describe how your facility would deal with a patient having a medical emergency
2. How would an injured civilian access emergency care at your facility?
3. How would an injured military person access emergency care at your facility?
4. What are barriers encountered by civilians and military persons when they are trying to access emergency care?
5. What type of medical documentation is performed at your facility?

### **EMERGENCY CARE IN ZAMBIA**

6. How is emergency care delivered in Zambia?
7. What are the 3 major problems facing emergency care infrastructure in Zambia?
8. What would you change about the way in which emergency care is provided?
9. How can the access of ill and injured persons to emergency care be improved?

### **OPEN**

10. Is there anything else you would like to add?

### Appendix 3: Kenya Focus Group Script

1. *I'd like to start the discussion by asking, what is a medical emergency?*
2. *Thank you for your ideas. A medical emergency is any life-threatening condition requiring rapid, immediate care. Now I'd like to talk about any medical emergencies that you have witnessed in the past (for instance breathing problems, chest pain, trauma, birth complications). By show of hands, how many of you have witnessed a medical emergency in the past? Ok so \_\_\_ out of \_\_\_\_\_. How many of you have witnessed more than 3? Ok so \_\_\_ out of \_\_\_\_\_.*
3. *Would someone like to start by describing a medical emergency they have witnessed or experienced? (Remember a medical emergency is any condition that requires immediate life-saving intervention)*

#### *Probes:*

- *What type of medical emergency was it?*
- *Was someone at the incident able to assist? Who? (Police man, layperson?)*
- *If there was someone at the incident to assist, what did that person do to help?*
- *Did you/the casualty need transport to a health facility for emergency care?*
- *How long did you/the casualty wait for transport? What transport was available?*
- *How long did it take to reach the facility?*
- *Did you encounter any challenges when trying to obtain emergency care?*

Allow as many people as volunteer to describe their medical emergency, and probe only with the above points if they have not already covered them. After each person's sharing make sure to thank them and acknowledge that their contribution is very valuable though it may be tragic or emotional.

Give at least 30 – 40 minutes for questions 1-3

4. *Thank you all for sharing your experiences so far. The types of emergencies you have mentioned include .... (list a summary of what they have shared burns, motor vehicle accidents.....) Are there any other types of medical emergencies that you see in your community?*

5. *By show of hands – who would help someone during a medical emergency? Ok so \_\_\_ out of \_\_\_ would help someone during a medical emergency.*

*By show of hands – who has helped someone during a medical emergency? Ok so \_\_\_ out of \_\_\_ have helped someone during a medical emergency.*

6. *Why would you help, or why would you not help, someone having a medical emergency?*

7. *If you said that you have or would help during a medical emergency – how would you help?*

8. *What do you think could make you and other people more likely to help?*

9. *What are barriers or challenges that you encounter when you are trying to access emergency care?*

*Probes:*

- *Where do you seek care for a medical emergency?*
- *Do you encounter any significant delays when trying to receive care for a medical emergency? What are they?*
- *How available is emergency care at that facility?*

10. *What are factors that make it easier for you to access emergency care?*

*Probes:*

- *Thinking back to your experiences, what factors have made it easier to access emergency care?*

*11. What changes could you recommend to improve your access to emergency care?*

*12. Is there anything else you would like to add?*

*Thank you so much for coming and sharing your experiences, thoughts, and opinions with us. Some of the experiences you have described involved death and tragedy. You have provided us with valuable information that will be used to improve the emergency care services in Kenya. If you would like to know the results of the study, your County Health Administrator will receive a copy of the final report. As mentioned before, if you feel you would like to speak to me after the session, I will be available. That concludes our focus group session.*

## Appendix 4: Zambia Proposal

### Out-of-Hospital and Pre-Hospital Emergency Care Needs in Zambia

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## **Abstract**

Zambia faces an increasing burden of acute disease, particularly in the realm of traumatic injury. The Zambian President, the Zambian Defence Force, and the Zambian Ministry of Health recognize this burden, and have called for the strengthening of Zambia's emergency care system. Before any interventions are implemented, an assessment of the need for emergency care must be conducted, as the burden of acute disease and healthcare infrastructure in Zambia remain largely undocumented.

The aim of this study is to ascertain how both community members and healthcare providers in Zambia feel about the burden of acute disease, the extent to which emergency care is currently being provided, and what recommendations these citizens have for ways in which emergency care provision can be improved. The data will be collected via focus group sessions with members of the community and healthcare providers in three Zambian provinces. Questions will relate to the experiences participants have had with acute disease, the current provision of emergency care, barriers to access, and ideas for future interventions. The data will then be compiled, and the results will be used to inform the strengthening of the Zambian emergency care system.

## **1. Introduction**

### **1.1 Literature review**

In February 2013 a major road traffic accident occurred along the Zambian Great East Road, and 58 people died in this incident alone. In May 2013 yet another bus accident claimed the lives of 17 Zambians. Accidents happen nearly every day on the Great East Road, and the first half of 2013 the death toll was greater than 90. Many of these deaths could be prevented by basic emergency care education and equipment. At the moment, Zambia has no emergency care infrastructure; there is no organized ambulance service, no universal emergency number or central call centre, few vehicles for transport, and no trained ambulance personnel.<sup>1</sup>

Zambia has a population of 14.3 million people. Health centres provide almost all aspects of health care, including management of emergency conditions. Adequately staffed and fully equipped emergency centres are not available. The under-five mortality rate per 1,000 births is 145, and the major causes of child

mortality are malaria, respiratory infections, diarrhoea, malnutrition and trauma.<sup>2</sup> The country has a total of 1400 healthcare facilities and a further 650 are being built.<sup>3</sup> It has the second lowest doctor to patient ratio and current statistics illustrate that the three top provinces with high mortality rates linked to preventable causes are the Copperbelt, Central and Eastern province. The Zambian Ministry of Health has recently procured 20 fully equipped ambulances that will be distributed to initiate the formation of pre-hospital infrastructure.<sup>3</sup>

Currently, there is no publically accessible tool that is available for conducting an assessment of out-of-hospital and pre-hospital care needs in a community, particularly when there is no existing system. The World Health Organization's *Guidelines for Essential Trauma Care* have been adapted in many contexts to identify priorities for low-cost improvements in trauma systems, but their recommendations are focused on trauma care in particular, rather than emergency care as a whole, and are best suited for evaluating systems that are already in place.<sup>4</sup> The WHO's *Prehospital Trauma Care Systems* emphasizes the importance of involving local community leaders and members in the design, development, and administration of a pre-hospital system, as this increases the likelihood that the community will accept, support, and sustain the system.<sup>5</sup> This document has also been utilized to create needs assessment forms, but these forms are targeted at existing systems as well.<sup>6</sup> In countries without existing emergency care systems, several recent studies have looked at the feasibility of implementing community first-responder training programs.<sup>7-10</sup> These programs all conducted some form of a needs assessment before implementing their intervention. The assessments involved meetings and focus groups with local stakeholders in health services, analyses of available healthcare personnel and resources, and surveys and interviews of community members on their experiences with medical emergencies. Although the importance of a community and healthcare facility –based needs assessment is recognized, there is no existing tool that is available for adaptation and use in different settings. If such a tool did exist, it would facilitate the assessment and improvement of out-of-hospital and pre-hospital emergency care systems.

### **Motivation for study**

In response to the increasing burden of acute disease and trauma, Zambian President Michael Sata has called for urgent practical interventions to be taken in order to stop this continuous loss of life on the roads. Lack of early healthcare

intervention has resulted in profound consequences on Zambia's public health system, leading to an emerging awareness of the need for emergency care services. In two recently held training sessions on emergency care in Zambia, the cohort of participants selected trauma as one of the top priorities in emergency care service needs, next to malaria and infectious diseases. The Zambian Defence Force and the Zambian Ministry of Health also recognize this burden, and have expressed their desire to implement interventions that will strengthen the emergency care system.

Since a large part of the Zambian healthcare budget comes from non-governmental organisations and private funders, the focus of healthcare data collection and reporting is often based on the millennium development goals and only highlights a selective distribution of disease burden.<sup>11</sup>

Currently no comprehensive disease burden data exist for Zambia.<sup>2</sup> In addition, there has been very little investigation into how community members themselves access and experience emergency medical care. There is a need for data to inform the decision on priority focus areas and support the development of emergency care, which may include emergency first aid response, triage, basic life support and transport to definitive care. Gathering this data will serve as an entry point to improve access to care and further infrastructure development.

The goal of this survey is to understand the unique out-of-hospital and pre-hospital emergency care needs within three Zambian provinces, and to use gathered information to make recommendations on ways to respond to these needs with interventions at several levels.

### **1.3 Research questions**

What are the out-of-hospital and pre-hospital emergency care needs in the Copperbelt, Central, and Eastern Provinces of Zambia?

### **1.4 Aim**

This study aims to utilize focus groups to gather information about the out-of-hospital and pre-hospital emergency care needs in Zambia, as well as the current way in which emergency care is being delivered.

### **1.5 Objectives**

This study has the following objectives:

1. To gather community experiences of access to and pre-hospital emergency care in three provinces of Zambia.
2. To gather experiences among healthcare providers of (i) current emergency care delivery (ii) emergency care infrastructure problems (iii) access to emergency care services.

## **2. Methods**

### **2.1 Study design**

The needs assessment tool will be a descriptive survey containing closed and open questions, and will be implemented as a paper questionnaire designed to be read by the interviewer in a focus group. One questionnaire will ask questions targeted towards community members, while another will ask questions targeted towards healthcare workers.

The community member focus groups will be conducted by three members of the Zambian Defence Force and three members of the Zambian Ministry of Health, who will be selected from the cohort of 20 healthcare practitioners who have been participating in the first “fundamentals in emergency care” educational course. These interviewers will be trained by the South African investigators to administer the interviews. Focus groups should consist of a minimum of 5 and a maximum of 10 participants.

The healthcare worker focus groups will be conducted by the investigators MB, MT, and CC. The goal for focus groups will be 5 participants at a time.

Participation in the focus groups will be entirely voluntary, and written consent will be obtained from all participants. No identifiable information will be collected from participants.

### **2.2 Study population**

The community interviewers will travel to three different provinces in Zambia; the urban Copperbelt Province, the rural Central Province, and the Eastern Province which is both urban and rural. These provinces have been selected by the Zambian Defence Force and the Zambian Ministry of Health due to increasing reports of emergencies. Purposeful sampling will be used to identify key informants as focus group participants. 50 community members in each province, i.e. 150 community members total will be included as part of this survey.

Community members will be identified by approaching the political or church leader in an urban area and traditional leader or headman in a rural area.

MB, MT, and CC will conduct focus groups with the cohort of 20 healthcare providers from the Zambian Defence force and the Zambian Ministry of Health who have been participating in the first “fundamentals in emergency care” educational course. An additional 20 healthcare providers will be identified by key informants within the three provinces; Copperbelt, Central, and Eastern. A total of 40 healthcare providers will be interviewed.

## **2.3 Sampling**

### **2.3.1 Inclusion and exclusion criteria**

Inclusion criteria: Adults that are part of the Zambian Defence force (ZDF), family of the ZDF, and civilians. Both healthcare providers and healthcare users will be included.

Exclusion criteria: Children and participants that refuse to take part will not be included.

## **2.4 Data collection and management**

Data collection in the community will begin in February 2014 by three Zambian Defence Force healthcare providers and three Zambian Ministry of Health healthcare providers using a survey tool with closed and open questions as shown in Appendix 9.2.

Data collection from healthcare providers will begin in January 2014 by MB, MT, and CC using a survey tool with closed and open questions as shown in Appendix 9.3.

For both cohorts, focus groups will be recorded with an audio recording device. The audio recordings will then be transcribed. If any community member participants do not speak English, their focus group questions will be translated into their native language by the Zambian Defence Force and Ministry of Health interviewers. To ensure translation accuracy, the audio recordings will be translated into English independently by both the original interviewer, and a separate interviewer who was not present at that particular focus group. The two independently translated versions will then be checked against each other by one of the investigators, and any discrepancies will be taken to a third party.

Collected data will be transcribed, compiled, and handled by the researchers only. The data will not contain any personal identifying information of the respondent who completed the survey. Once the focus group recordings have been transcribed they will be deleted. The recordings from healthcare provider focus groups will never be handled by Zambian nationals. Only study investigators will have access to the compiled data. The data will not be sold/used for any commercial purpose.

## 2.5. Timeline

2013-2014	Dec	Jan 2014	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct
Ethics Review	X										
Training to administer interviews		X									
Community focus groups			X	X	X						
Healthcare Professional focus groups		X	X								
Data Compilation and Analysis						X	X	X			
Compilation of Final Report									X	X	
Publication											X

## 3. Statistical analysis

Once the surveys are administered, the quantitative and demographic data will be collated into an online database. The data will then be accessible for extraction and analysis. The qualitative focus groups will be coded and analysed with the support of qualitative research statisticians at the University of Cape Town. We will perform a thematic analysis of community member focus groups to identify exposure to emergencies, type and frequency of emergencies witnessed, desire to provide assistance, and ideas for potential interventions. We will perform a thematic analysis of healthcare worker focus groups to identify how emergency care is accessed and delivered in their communities, problems they see in the provision of emergency care, and how they think emergency care could be improved.

## 4. Ethical and legal considerations

Ethics approval for this project will also be requested from the Zambian Ministry of Health on receipt of UCT ethics approval.

Participation in these focus groups is entirely voluntary, and participants will be fully informed of the study before they are asked to sign a consent form. Healthcare providers will be asked about any problems they have identified related to emergency care in Zambia. We realize they may be reluctant to discuss issues they encounter in their jobs and may worry about negative consequences. No names or other identifying information will be collected. The focus groups with healthcare workers will be conducted by investigators from South Africa, and the recordings will be kept confidential. Once the focus groups have been transcribed, they will be completely de-identified and the recordings will be erased. The de-identified data from respondents will be compiled together and will be analysed in groups, so there will be no way to identify what a particular participant answered. All data gathered will be stored securely.

The focus groups with community members will be conducted by members of the Zambian Defence Force and the Zambian Ministry of Health. The recordings will be passed on to the South African investigators, who will then transcribe and completely de-identify the information. This data will be compiled, analysed, and stored securely and anonymously as well.

We do not anticipate the participants to be negatively affected by participating in these focus groups, but participants may be asked to answer questions regarding a traumatic medical event they have witnessed. If someone is identified as requiring trauma support, they will be given an option to make use of counselling or trauma support services. The interviewers will also make sure that all participants understand that they are free to not answer any questions if they feel uncomfortable, and that they are able to leave the focus group at any time.

## **5. Limitations**

Focus groups with healthcare providers will be conducted by the South African investigators. We do not anticipate any problems related to having foreign investigators conduct these focus groups, as half of the healthcare providers have already worked extensively with the investigators extensively in the “fundamentals in emergency care” educational course. The questions will also be worded in such a way as to prevent bias towards the interviewer.

Focus groups with community members will be conducted by three members of the Zambian Defence Force and three members of the Zambian Ministry of Health. We realize that being interviewed by members of either of these groups may affect participant responses. We will try to diminish this bias by having a Zambian Defence

Force investigator paired with a Ministry of Health investigator in each community. Also, none of the interviewers will be dressed in uniform; they will all be wearing casual, every-day clothing. As with the other survey, the questions will be worded in such a way to prevent bias towards the interviewer.

The pairs of interviewers will introduce themselves by name and affiliation only. They will be paired so that one is from the ZDF and one is from the Ministry. They will only give their name and organization of affiliation; they will not provide any rank. They will provide their organization in order to lend credibility to their presence, as both the ZDF and MoH are respected providers of healthcare in Zambia. It will also demonstrate that the results of this study will actually be used to change the system. None of the interviewers will identify themselves by rank, as this might intimidate participants or cause others to feel the need to provide their own rank.

The individuals being interviewed may have difficulty remembering information accurately to share it and hence may contribute to recall bias. The questions will be enquiring about major medical emergencies though, which will diminish recall bias.

Language barriers may be a challenge as the survey has been written in English, and some of the questions and answers given by the participants may need to be translated. This will only be a problem in the community, as the healthcare providers all speak English. The translation for community members will be done by the interviewer and crucial information may be lost in translation. We will do our best to minimize this limitation by having two separate interviewers translate the audio recordings into English; the original person conducting the focus group, and an additional interviewer who was not present.

Due to lack of resources, we will not be able to conduct quality assurance procedures such as “member checking” on the transcribed scripts. We do not have enough resources to travel back to each of the provinces, and it would be difficult to re-locate all of the participants of the focus groups.

## **6. Resources**

### **6.1 Available resources**

Resources needed for this study will come from the Zambian Defence Force, the Zambian Ministry of Health, and the Zambian Twinning Centre.

### **6.2 Budget**

Description	
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Stationary & data collection materials	R 300
Transport for two data capturers	R 1000
Accommodation for two data capturers	R 6000
Dictaphones x 2	R 2400
Accommodation for research support x 2	R 4800
Training costs of interviews	R 1600
Transport of focus group participants	R 2500
TOTAL	R 18600

## 7. Reporting and implementation of results

Once the data is collected and analysed, results will be reported back to the Zambian Defence Force, the Zambian Ministry of Health, and the Zambian Twinning Centre. The reports produced by this study will be utilized to plan appropriate intervention in the respective three provinces. The results will also be used to inform future needs assessments conducted in African countries.

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10. Sun, J. H., & Wallis, L. A. (2012). The emergency first aid responder system model: using community members to assist life-threatening emergencies in violent, developing areas of need. *Emergency medicine journal*, 29(8), 673-678.
11. Central Statistics Office for Zambia, <http://www.zamstats.gov.zm> (accessed 1 Nov 2013)

## Appendix 5: Zambia Ethics Approval

003/2014: approval letter Prof Wallis

UNIVERSITY OF CAPE TOWN



Faculty of Health Sciences  
Human Research Ethics Committee  
Room E52-24 Groote Schuur Hospital Old Main Building  
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15 April 2014

**HREC REF: 003/2014**

**Prof L Wallis**  
Emergency Medicine  
J Floor  
OMB

Dear Prof Wallis

**PROJECT TITLE: OUT-OF-HOSPITAL AND PRE-HOSPITAL EMERGENCY CARE NEEDS IN ZAMBIA (MSc student - Morgan Broccoli)**

Thank you for submitting your study to the Faculty of Health Sciences Human Research Ethics Committee for review.

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

**Approval is granted for one year until the 30 April 2015.**

***We acknowledge that the MMed student Morgan Broccoli will also be involved in this study.***

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.

(Forms can be found on our website: [www.health.uct.ac.za/research/humanethics/forms](http://www.health.uct.ac.za/research/humanethics/forms))

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

**Please quote the HREC. REF in all your correspondence.**

Yours sincerely

**PROFESSOR M BLOCKMAN**  
**CHAIRPERSON, FHS HUMAN ETHICS**

Federal Wide Assurance Number: FWA00001637.

Institutional Review Board (IRB) number: IRB00001938

This serves to confirm that the University of Cape Town Human Research Ethics Committee complies to the Ethics Standards for Clinical Research with a new drug in patients, based on the Medical Research Council (MRC-SA), Food and Drug Administration (FDA-USA), International Convention on Harmonisation Good Clinical Practice (ICH GCP) and Declaration of Helsinki guidelines.

s.thomas

## Appendix 6: Kenya Proposal

### Out-of-Hospital and Pre-Hospital Emergency Care Needs in Kenya

**Investigators:**

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Dr Emilie Calvello

Assistant Professor, Department of Emergency Medicine  
University of Maryland School of Medicine

Professor Lee A Wallis

African Federation for Emergency Medicine  
Head: Division of Emergency Medicine, UCT

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## **Abstract**

Kenya faces an increasing burden of acute disease, with a high burden of communicable diseases and a steadily increasing burden of non-communicable diseases (cancer, diabetes and hypertension), mental illness, and road traffic injuries. Yet the emergency care system in Kenya remains underdeveloped. With no health care providers specifically trained in Kenya to provide emergency care, patients presenting to Kenyan emergency centres with acute, time-sensitive illness and injury are cared for by undertrained healthcare providers. There is also no coordinated means of transferring critical patients to hospitals or higher-level facilities. Recently, the need for strengthening Kenya's emergency care system has gained more recognition. But before any interventions are implemented, an assessment of the current need for emergency care must be conducted, as the burden of acute disease and barriers to accessing emergency care in Kenya remain largely undocumented.

The aim of this study is to ascertain how community members in Kenya feel about emergency care in their region, the barriers they face when trying to access emergency care, and what recommendations these citizens have for ways in which emergency care provision can be improved. The data will be collected via focus group sessions with community members in eight regions in Kenya. Questions will relate to participants' current perceptions of emergency care, the barriers they face when trying to access emergency care, and ideas for future interventions. The data will then be compiled, and the results will be used to inform the strengthening of the Kenyan emergency care system.

## **1. Introduction**

### **1.2 Literature review**

Kenya currently faces an increasing burden of acute disease, with both a high burden of communicable diseases and a steadily increasing burden of non-communicable diseases (cancer, diabetes and hypertension), mental illness, and road traffic injuries. Malaria is the leading cause of morbidity, followed by respiratory diseases.<sup>1</sup> HIV/AIDS also plays a significant role in the country's morbidity and mortality. As all of these conditions can present with acute complications, the emergency workload in Kenya is likely to increase.<sup>2</sup> Kenya is also significantly impacted by disasters and other major incidents. Kenya's major

incidents profile is dominated by droughts, floods, fires, terrorism, collapsed buildings, transportation accidents, and epidemics. As Kenya has no integrated emergency services and lacks resources for emergency care, many incidents in Kenya escalate to such an extent that they become major incidents.<sup>3</sup> The recent natural and manmade disasters have resulted in a high number of deaths and injuries, which suggests that Kenya is still not adequately prepared to handle major incidents.<sup>4</sup>

Kenya has a population of over 38 million people. The majority of the population (68%) lives in rural areas.<sup>5</sup> There are 222 public primary hospitals, 10 public secondary hospitals, and three public tertiary hospitals in Kenya.<sup>6</sup> Most Emergency Centres in Kenya are staffed by clinical officers, who are healthcare providers with three years of intensive clinical medicine training. These clinical officers either work independently, or alongside medical officers. Both clinical officers and medical officers lack specific training in emergency medicine, although they provide most of the acute and emergency care in Kenya. Kenyan Emergency Centres provide fragmented emergency care, as patients are evaluated in different areas of the centre and by providers from different specialties depending on their complaint.<sup>7</sup> The only one public provider of pre-hospital emergency care services in Kenya is St. John Ambulance, who operate ten ambulances in the country.<sup>8</sup> There are private ambulances in Nairobi, but these only serve patients who are able to pay. The majority of acutely ill and injured patients are transported to hospitals by car, truck, taxi, or other public transportation. Very few present to emergency centres via ambulance, as ambulances are scarce and the private services are not affordable for most.<sup>7</sup>

Currently, there is no publically accessible tool that is available for conducting an assessment of out-of-hospital and pre-hospital care needs in a community, particularly when there is no existing system. The World Health Organization's *Guidelines for Essential Trauma Care* have been adapted in many contexts to identify priorities for low-cost improvements in trauma systems, but their recommendations are focused on trauma care in particular, rather than emergency care as a whole, and are best suited for evaluating systems that are already in place.<sup>9</sup> The WHO's *Prehospital Trauma Care Systems* emphasizes the importance of involving local community leaders and members in the design, development, and administration of a pre-hospital system, as this increases the likelihood that the community will accept, support, and sustain the system.<sup>10</sup> This

document has also been utilized to create needs assessment forms, but these forms are targeted at existing systems as well.<sup>11</sup> In countries without existing emergency care systems, several recent studies have looked at the feasibility of implementing community first-responder training programs.<sup>12-15</sup> These programs all conducted some form of a needs assessment before implementing their intervention. The assessments involved meetings and focus groups with local stakeholders in health services, analyses of available healthcare personnel and resources, and surveys and interviews of community members on their experiences with medical emergencies. Although the importance of a community and healthcare facility –based needs assessment is recognized, there is no existing tool that is available for adaptation and use in different settings. If such a tool did exist, it would facilitate the assessment and improvement of out-of-hospital and pre-hospital emergency care systems.

Before conducting this investigation, the investigators will have recently completed an assessment of the emergency care perceptions and needs of community members in Zambia. The investigators hope to learn from, and build upon their experiences with the Zambian needs assessment in order to optimize the study design in Kenya.

### **Motivation for study**

Currently no comprehensive acute disease burden data exists for Kenya. In addition, there has been very little investigation into how community members themselves access and experience emergency medical care. There is a need for data to inform the decision on priority focus areas and support the development of emergency care, which may include emergency first aid response, triage, basic life support and transport to definitive care. Gathering this data will serve as an entry point to improve access to care and further infrastructure development.

The goal of this survey is to understand the unique out-of-hospital and pre-hospital emergency care needs in Kenya, and to use gathered information to make recommendations on ways to respond to these needs with interventions at several levels.

### **1.3 Research questions**

What are the emergency care perceptions and needs of community members in Kenya, and how can these be met or improved upon to ensure effective delivery of emergency care to the community?

## **1.4 Aim**

This study aims to utilize focus groups to gather information about the out-of-hospital and pre-hospital emergency care needs in Kenya, as well as the current way in which emergency care is being delivered.

## **1.5 Objectives**

This study has the following objectives:

3. To gather community perceptions and experiences of emergency care in their region
4. To determine availability of, and access to, emergency care by community members in eight regions in Kenya.
5. To ascertain citizen-perceived solutions to barriers to receiving emergency care.

## **2. Methods**

### **2.5 Study design**

The needs assessment tool will be a descriptive survey containing closed and open questions, and will be implemented as a paper questionnaire designed to be read by the interviewer in a focus group. The questionnaire will ask questions targeted towards community members in Kenyan cities and rural villages.

The community member focus groups will be conducted by three Kenyan clinical officers. These clinical officers will be recruited for the study by investigator BW. Clinical officers are healthcare providers with three years of intensive training in clinical medicine. These clinical officers will be trained by investigators MB, MT, and CC to administer the interviews. Focus groups should consist of a minimum of five and a maximum of ten participants.

Participation in the focus groups will be entirely voluntary, and written consent will be obtained from all participants. No identifiable information will be collected from participants.

### **2.6 Study population**

The three clinical officers will travel to eight regions in Kenya based on the previous eight administrative provinces of Kenya; Central, Coast, Eastern,

Nairobi, North Eastern, Nyanza, Rift Valley, and Western. Purposeful sampling will be used to identify key informants as focus group participants. Focus groups will be conducted in each region until thematic saturation is reached. We estimate that this will take 4-5 days per region, at a rate of 1-2 focus groups per day. In total, we expect to enrol 60-80 community members per region, for a total of 480-640 participants. Roughly half of the participants from each region will be selected from an urban area, and the other half will be selected from a rural area. Community members will be identified by approaching the political or church leader in an urban area and traditional leader or headman in a rural area. The study population will include both those who utilize government services only, and those who have the means to access the private sector.

## **2.7 Sampling**

### **2.3.1 Inclusion and exclusion criteria**

Inclusion criteria: Adult volunteers living in the study locations.

Exclusion criteria: Children and participants that refuse to take part will not be included.

## **2.8 Data collection and management**

Investigators MB, MT, and CC will train the three clinical officers on how to conduct focus groups in April 2014. Data collection in the community will begin in May 2014 by three clinical officers using a survey tool with closed and open questions as shown in Appendix 9.2.

Focus groups will be recorded with an audio recording device. The audio recordings will then be transcribed. If any community member participants do not speak English, their focus group questions will be translated into their native language by the interviewers. To ensure translation accuracy, the audio recordings will be translated into English independently by both the original interviewer, and a separate interviewer who was not present at that particular focus group. The two independently translated versions will then be checked against each other by one of the investigators, and any discrepancies will be taken to a third party.

Collected data will be transcribed, compiled, and handled by the researchers only. The data will not contain any personal identifying information of the respondent who participated in the focus group. Once the focus group recordings have been transcribed they will be deleted. Only study investigators will have

access to the compiled data. The data will not be sold/used for any commercial purpose.

## 2.5. Timeline

2014	Feb	March	April	May	Jun	July	Aug	Sept	Oct
Ethics Review	X	X							
Training to administer interviews			X						
Community focus groups				X	X				
Data Compilation and Analysis						X	X		
Compilation of Final Report							X	X	
Publication									X

## 3. Statistical analysis

Once the focus groups are conducted, the quantitative and demographic data will be collated into a database. The data will then be accessible for extraction and analysis. The qualitative focus groups will be coded and analysed using NVivo 10 with the support of qualitative research statisticians at the University of Cape Town. We will perform a thematic analysis of community member focus groups to identify exposure to emergencies, perceptions of emergency care, perceived barriers to emergency care, and ideas for potential interventions.

## 4. Ethical and legal considerations

Ethics approval for this project will also be requested from the Aga Khan University Hospital, Nairobi, and the National Council for Science and Technology on receipt of UCT ethics approval.

Participation in these focus groups is entirely voluntary, and participants will be fully informed of the study before they are asked to sign a consent form. No names or other identifying information will be collected. The focus groups with community members will be conducted by trained Kenyan clinical officers, and the recordings will be kept confidential. Once the focus groups have been transcribed, they will be completely de-identified and the recordings will be erased. The de-identified data from respondents will be compiled together and will be analysed in groups, so there

will be no way to identify what a particular participant answered. All data gathered will be stored securely.

We do not anticipate the participants to be negatively affected by participating in these focus groups, but participants may be asked to answer questions regarding a traumatic medical event they have witnessed. As such, we will make every effort to identify the existing psychological counselling services for every community we travel to. If someone is identified as requiring trauma support, they will be provided with counselling or trauma support services. Since it is possible that some communities will not have psychological counselling services, we will also train the clinical officer interviewers in basic psychological first aid during their training course. We will train them based on the WHO's *Psychological First Aid: Guide for Field Workers*. The interviewers will then be able to identify anyone who may require counselling services, and either refer them or provide counselling themselves as appropriate. The interviewers will also make sure that all participants understand that they are free to not answer any questions if they feel uncomfortable, and that they are able to leave the focus group at any time.

## **5. Limitations**

This study has several limitations:

The individuals being interviewed may have some difficulty remembering information accurately enough to share it and hence may contribute to recall bias. The questions will be enquiring about major medical emergencies though, which should diminish recall bias.

Language barriers may be a challenge as the survey has been written in English, and some of the questions and answers given by the participants may need to be translated. For this reason, Kenyan clinical officers will be trained to conduct the focus groups. The translation for community members will be done by the interviewer and crucial information may be lost in translation. We will do our best to minimize this limitation by having two separate interviewers translate the audio recordings into English; the original person conducting the focus group, and an additional interviewer who was not present.

We have given significant consideration to the fact that the investigators themselves will not be conducting the focus groups, and will instead be relying on the Kenyan clinical officers to conduct the focus groups. We strongly believe that it is crucial to have the focus groups conducted by someone who is from the community being interviewed and speaks the local language. It would be extremely difficult to conduct

focus groups via a translator, as focus groups rely on group dynamics and participation, and it would not be possible for the facilitator to keep up with the conversation when using a translator. Using focus group facilitators who are from the local community is also important in that it encourages participants to speak freely and comfortably, and not be concerned or intimidated that they are speaking to a foreign doctor. Additionally, we considered the fact that it would be helpful to have an investigator present to make sure that the clinical officers are conducting the focus groups consistently in the manner that they were taught. To do this, however, we would need an additional translator to sit next to the investigator and translate the conversation. This real-time translation would be difficult, and at best the investigator would get a sense of the way in which the clinical officer was facilitating the group. The downside to this would be the actual presence of the investigator in the room during the focus group. There is a distinct possibility that this would make participants feel uncomfortable and discourage them from voicing their true opinions. On balance we believe that it would be best to not have the investigators be present for the focus groups. We will address the potential limitations of this by rigorously selecting and training the clinical officers who will be conducting the focus groups. We will also accompany them for trials runs where we can determine if they are able to consistently and accurately conduct a focus group.

Because our study participants are disseminated across rural areas in Kenya and are very difficult to contact via telephone, mail, or email, we will not be able to do member checking. To ensure quality of the transcriptions, we will be sending the transcriptions back to the focus group leaders so that they can check the accuracy of the translation and transcription. This will allow for quality assurance because they were present during the focus group sessions.

## **6. Resources**

### **6.1 Available resources**

The investigators are currently seeking funding for this study through grants from the University of Maryland, AIHA, and Johns Hopkins University.

### **6.2 Budget**

<b>Training Costs</b>		
Flights for training team	9000 R per flight x 4	36000

Accommodation for training team x 5 days	300 R per person x 4 x 5 days	6000
Venue for 4 days	1000 R per day x 4	4000
<b>Data Collection Costs</b>		
Transport and accommodation for 1 clinical officer for 1 province (5 days)	1875 R per clinical officer x 8 provinces	15000
Stipend for clinical officers	250 R per day x 10 days x 4	10000
Participant travel stipend	20 R per participant x 20 per day x 5 days x 8 provinces	16000
<b>Translation and Transcription Costs</b>		
Stipend for clinical officers	250 R per day x 10 days x 4	10000
<b>Materials</b>		
Dictaphones (1 per clinical officer)	600 R x 4	2400
Paper, pens	600 R	600
	<b>Total</b>	<b>100000</b>

## 7. Reporting and implementation of results

Once the data is collected and analysed, the results will be compiled into a report. The report produced by this study will be utilized to advocate for the investment of resources in emergency care, and the development of Kenya's emergency care system. The results will highlight which steps should be taken immediately to improve access to emergency care. The results will also be used to inform future needs assessments conducted in African countries.

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10. Sasser S, Varghese M, Kellermann A, Lormand J. Prehospital Trauma Care Systems. Geneva: World Health Organization, 2005.
11. Nielsen, K., Mock, C., Joshipura, M., Rubiano, A. M., Zakariah, A., & Rivara, F. (2012). Assessment of the status of prehospital care in 13 low-and middle-income countries. *Prehospital Emergency Care*, 16(3), 381-389.
12. Jayaraman, S., Mabweijano, J. R., Lipnick, M. S., Caldwell, N., Miyamoto, J., Wangoda, R., ... & Ozgediz, D. (2009). Current patterns of prehospital trauma care in Kampala, Uganda and the feasibility of a lay-first-responder training program. *World journal of surgery*, 33(12), 2512-2521.
13. Improvements in prehospital trauma care in an African country with no formal EMS
14. Geduld, H., & Wallis, L. (2011). Taxi driver training in Madagascar: the first step in developing a functioning prehospital emergency care system. *Emergency Medicine Journal*, 28(9), 794-796.
15. Sun, J. H., & Wallis, L. A. (2012). The emergency first aid responder system model: using community members to assist life-threatening emergencies in violent, developing areas of need. *Emergency medicine journal*, 29(8), 673-678.

## Appendix 7: Kenya Ethics Approval



**UNIVERSITY OF CAPE TOWN**  
**Faculty of Health Sciences**  
**Human Research Ethics Committee**



**Room E52-24 Old Main Building**  
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**Observatory 7925**  
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25 April 2014

**HREC REF: 221/2014**

**Prof L Wallis**  
Emergency Medicine

Dear Prof Wallis

**PROJECT TITLE: OUT-OF-HOSPITAL AND PRE-HOSPITAL EMERGENCY CARE NEEDS IN KENYA (MSc student - M Broccoli)**

Thank you for your response letter to the Faculty of Health Sciences Human Research Ethics Committee dated 22 April 2014.

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

**Approval is granted for one year until the 30<sup>th</sup> April 2015**

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.

(Forms can be found on our website: [www.health.uct.ac.za/research/humanethics/forms](http://www.health.uct.ac.za/research/humanethics/forms))

***We acknowledge that the following student, Morgan Broccoli is also involved in this study.***

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please quote the HREC reference no in all your correspondence.

Yours sincerely

*T. Burgess*

**PROFESSOR M BLOCKMAN**  
**CHAIRPERSON, FHS HUMAN ETHICS**

Federal Wide Assurance Number: FWA00001637.

Institutional Review Board (IRB) number: IRB00001938

This serves to confirm that the University of Cape Town Human Research Ethics Committee complies to the Ethics Standards for Clinical Research with a new drug in patients, based on the Medical Research Council (MRC-SA), Food and Drug Administration (FDA-USA), International Convention on Harmonisation Good Clinical Practice (ICH GCP) and Declaration of Helsinki guidelines.

The Human Research Ethics Committee granting this approval is in compliance with the ICH Harmonised Tripartite Guidelines E6: Note for Guidance on Good Clinical Practice (CPMP/ICH/135/95) and FDA Code Federal Regulation Part 50, 56 and 312.



**NATIONAL COMMISSION FOR SCIENCE,  
TECHNOLOGY AND INNOVATION**

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Ref: No.

Date:

**25<sup>th</sup> July, 2014**

**NACOSTI/P/14/0018/2568**

Dr. Benjamin Wambugu Wachira  
Aga Khan University Hospital  
P.O.Box 30270-00100  
**NAIROBI.**

**RE: RESEARCH AUTHORIZATION**

Following your application for authority to carry out research on *“Out-of-Hospital and Pre-Hospital Emergency Care Needs in Kenya,”* I am pleased to inform you that you have been authorized to undertake research in **all Counties** for a period ending **31<sup>st</sup> October, 2014.**

You are advised to report to **the County Commissioners, the County Directors of Education and the County Coordinators of Health, all Counties** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

  
**DR. S. K. LANGAT, OGW  
FOR: SECRETARY/CEO**

Copy to:

The County Commissioners  
The County Directors of Education  
The County Coordinators of Health  
All Counties.

## **Appendix 8: Zambia Consents**

Dear Participant,

We are undertaking this survey as part of a larger project on Emergency Care delivery in Zambia and we would like to invite you to participate in one of our focus groups. This focus group will last for 1-2 hours, and we will only ask you to participate in this one session. This study has received ethics approval from the University of Cape Town.

Through your participation we will develop an understanding of your perceptions of current Emergency Care delivery, the Emergency Care infrastructure problems and access to Emergency Care services. This will be used to develop strategies for improving Emergency Care services for all people within Zambia. You will not directly benefit from this focus group, but you will indirectly benefit when the results are used to improve emergency care services in your province.

Your responses are important to obtain a better understanding of the current emergency care situation in Zambia. The focus group will be recorded. Participation is entirely voluntarily and you may refuse to participate at any time. Information provided by you will remain anonymous and confidential and we do not require your name during the recording of the interview. You may choose not to answer any questions that make you uncomfortable, and if you feel uncomfortable during the focus group you are free to leave at any time.

To maintain confidentiality, only the investigators will have access to the focus group recordings. These recordings will be transcribed and de-identified by the study team. After transcription, the recordings will be deleted. Confidentiality cannot be guaranteed, however, and there is a small risk that someone else may gain access to the de-identified recordings. We ask that you do your own part to maintain participants' confidentiality by not repeating anything you have heard in this session after you leave.

Before signing this consent form, please ask the focus group leader any questions you may have. These questions should be answered satisfactorily before you proceed.

If you are not satisfied with the manner in which the focus group is conducted please do not hesitate to report it to the Lt. Col. G. Sandala and Lt. Col. D. Ndhlovo, who are members of the ZDF collaborating with this study. Lt. Col. G. Sandala can be contacted at 0977758389, gef\_sandala@yahoo.com and Lt. Col. D. Ndhlovo can be contacted at 0978232259; dchiweruzo68@gmail.com.

You can also contact Prof Marc Blockman, Chair of the UCT Ethics Committee, at marc.blockman@uct.ac.za or +27 21 406 6338 with any questions regarding your rights as participants in this study.

If you have any further questions or comments or would like further information on the study, please do not hesitate to contact investigator Morgan Broccoli at programs@afem.info or investigator Michele Twomey at micheletwomey@gmail.com.

By signing this consent form you agree to voluntary participation in this focus group, are aware of the purpose of this survey and the possibility that it may be published. If published, all data will be de-identified and compiled, and only general themes will be discussed. You will not be identified in any way in any publication.

Thank you for your time

\_\_\_\_\_  
Participant's signature

\_\_\_\_\_  
Date

Dear Participant,

We are undertaking this survey as part of a larger project on Emergency Care delivery in Zambia and we would like to invite you to participate in one of our focus groups. This focus group will last for 1-2 hours, and we will only ask you to participate in this one session. This study has received ethics approval from the University of Cape Town.

Through your participation we will develop an understanding of the unique emergency care needs at community level. This will be used to develop strategies for improving Emergency Care services for all people within Zambia. You will not directly benefit from this focus group, but you will indirectly benefit when the results are used to improve emergency care services in your province.

Your responses are important to obtain a better understanding of the emergency care needs of Zambians. The interview will be recorded. Participation is entirely voluntarily and you may refuse to participate at any time. Information provided by you will remain anonymous and confidential and we do not require your name during the recording of the interview. You may choose not to answer any questions that make you uncomfortable, and if you feel uncomfortable during the focus group you are free to leave at any time.

To maintain confidentiality, only the investigators will have access to the focus group recordings. These recordings will be transcribed and de-identified by the study team. After transcription, the recordings will be deleted. Confidentiality cannot be guaranteed, however, and there is a small risk that someone else may gain access to the de-identified recordings. We ask that you do your own part to maintain participants' confidentiality by not repeating anything you have heard in this session after you leave.

Before signing this consent form, please ask the focus group leader any questions you may have. These questions should be answered satisfactorily before you proceed.

If you are not satisfied with the manner in which the focus group is conducted please do not hesitate to report it to the Lt. Col. G. Sandala and Lt. Col. D. Ndhlovo, who are members of the ZDF collaborating with this study. Lt. Col. G. Sandala can be

contacted at 0977758389, gef\_sandala@yahoo.com and Lt. Col. D. Ndhlovo can be contacted at 0978232259; dchiweruzo68@gmail.com.

You can also contact Prof Marc Blockman, Chair of the UCT Ethics Committee, at marc.blockman@uct.ac.za or +27 21 406 6338 with any questions regarding your rights as participants in this study. If you have any further questions or comments or would like further information on the study, please do not hesitate to contact investigator Morgan Broccoli at programs@afem.info or investigator Michele Twomey at micheletwomey@gmail.com.

By signing this consent form you agree to voluntary participation in this focus group, are aware of the purpose of this survey and the possibility that it may be published. If published, all data will be de-identified and compiled, and only general themes will be discussed. You will not be identified in any way in any publication.

Thank you for your time

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Participant's signature

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Date

## **Appendix 9: Kenya Consent**

Dear Participant,

We are undertaking this survey as part of a larger project on Emergency Care delivery in Kenya and we would like to invite you to participate in one of our focus groups. This focus group will last for 1-2 hours, and we will only ask you to participate in this one session. This study has received ethics approval from the University of Cape Town, the National Council for Science and Technology, and Aga Khan University Hospital, Nairobi.

The focus group session will contain approximately 10 adults from your community, and will be run by a healthcare provider from Nairobi. During the focus group, you will be asked questions about your understanding of medical emergencies, your experience with medical emergencies in your community, barriers you encounter when trying to access emergency care, any positive experiences you've had when accessing emergency care, and any recommendations you have for how emergency care in your community can be improved. Everyone present in the focus group will get the chance to communicate their experiences and their ideas if they desire to.

These focus groups will take place in rural and urban settings of the 8 historical Kenyan provinces. Through your participation we will develop an understanding of the unique emergency care needs at the community level. This will be used to develop strategies for improving Emergency Care services for all people within Kenya. You will not directly benefit from this focus group, but you will indirectly benefit when the results are used to improve emergency care services in your province.

Your responses are important to obtain a better understanding of the emergency care needs of Kenyans. The interview will be recorded. Participation is entirely voluntarily and you may refuse to participate at any time. Information provided by you will remain anonymous and confidential and we do not require your name during the recording of the interview. You may choose not to answer any questions that make you uncomfortable, and if you feel uncomfortable during the focus group you are free to leave at any time.

To maintain confidentiality, only the investigators will have access to the focus group recordings. These recordings will be transcribed and de-identified by the study team. After transcription, the recordings will be deleted. Confidentiality cannot be guaranteed, however, and there is a small risk that someone else may gain access to the de-identified recordings. We ask that you do your own part to maintain participants' confidentiality by not repeating anything you have heard in this session after you leave.

Before signing this consent form, please ask the focus group leader any questions you may have. These questions should be answered satisfactorily before you proceed. If you are not satisfied with the manner in which the focus group is conducted please do not hesitate to report it to the Chairman of the Aga Khan University Health Research Ethics Committee at +254 20 366 2107.

You can also contact Prof Marc Blockman, Chair of the UCT Ethics Committee, at [marc.blockman@uct.ac.za](mailto:marc.blockman@uct.ac.za) or +27 21 406 6338 with any questions regarding your rights as participants in this study.

If you have any further questions or comments or would like further information on the study, please do not hesitate to contact investigator Benjamin Wachira at [benjamin.wachira@gmail.com](mailto:benjamin.wachira@gmail.com)/ +254 728 593 360 or investigator Morgan Broccoli at [programs@afem.info](mailto:programs@afem.info)

By signing this consent form you agree to voluntary participation in this focus group, are aware of the purpose of this survey and the possibility that it may be published. If published, all data will be de-identified and compiled, and only general themes will be discussed. You will not be identified in any way in any publication.

Thank you for your time

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Participant's signature

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Date