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Emergency Medical Services System Development in Yaoundé, Cameroon

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Emergency Medical Services System Development in Yaoundé, Cameroon

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Abstract

Emergency Medical Services System Development in Yaoundé, Cameroon

By Yunmi Chung

Background: Cameroon is a lower-middle income country in sub-Saharan Africa with poor health indicators compared to other similar income level countries. Health indicators such as life expectancy and years of life lost are greatly affected by infectious diseases and road injuries. Emergency Medical Services (EMS) is important in reducing preventable disabilities and deaths by promptly responding to unexpected illnesses or accidents, yet development of a national EMS system has been minimal in Cameroon. Korea International Cooperation Agency (KOICA) and Cameroon's Ministry of Public Health (MoPH) have recently established the Yaoundé Medico-Surgical Emergency Center (YMSEC) to increase EMS capacity. To inform the integration of YMSEC into Cameroon's EMS system of care, this project aimed to assess the current EMS environment, emergency department (ED) resources, patient demand, and utilization.

Methods: EMS environment was assessed through key informant interviews and resource surveys. Resource surveys and patient demographic and satisfaction (PDS) surveys were conducted at four tertiary level hospital EDs in Yaoundé between June and July 2014. Resource surveys were conducted with twelve hospital employees and PDS surveys were conducted with 103 patients (88.8% response rate). PDS survey data was collected in Epi Info and analyzed using SAS and Excel. Excel was also used to analyze the resource survey. Qualitative data was analyzed using MAXQDA.

Results: Emergency medicine (EM) and emergency care exist and EDs are well established in Yaoundé. Level of available essential emergency medical equipment and resources vary between EDs. Emergency protocols exist but many are outdated or only exist in oral form. No formal EMS system is in place and patients rely almost exclusively on taxis or personal vehicles to get to an ED despite the existence of SAMU and ambulances.

Conclusion: There is potential for Yaoundé to develop a great EMS system as it already has many basic components required for building an effective one. However, existing EM specialists, hospital resources, and communication systems are often underutilized and misused. Additional EM specialists must be trained, funds must be allocated, and legal and regulatory actions must be taken to set up an effective EMS system to reduce preventable morbidity and mortality.

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EMERGENCY MEDICAL SERVICES SYSTEM DEVELOPMENT IN YAOUNDÉ, CAMEROON

Chapter I. Introduction

1.1 Background

The Republic of Cameroon is a lower- middle- income country with a population of 22.5 million with Gross Domestic Product (GDP) per capita around 1,329 USD (CIA, 2014; The World Bank, 2014a, 2014b). A little over 10% of the population lives in the capital city of Yaoundé (CIA, 2014). The World Health Organization (WHO) estimates that injuries, especially road traffic injuries (RTIs), cost Cameroonians approximately 111 lives and 3,170 disability-adjusted life-years (DALYs) per 100,000 population annually (McGreevy et al., 2014; WHO, 2011b). A retrospective study of injury and violence patterns in Yaoundé using administrative data from the Central Hospital of Yaoundé reported that in 2007 alone there was a total of 6,234 injury cases with nearly 60% due to road traffic accidents and 22.5% due to intentional injuries (McGreevy et al., 2014).

The highest rates of various forms of injury that require Emergency Medical Services (EMS) are observed in low-income countries and a disproportionate number of these injuries are observed in sub-Saharan Africa (Juillard, Etoundi Mballa, Biloungа Ndongo, Stevens, & Hyder, 2011; Reynolds, Mfinanga, Sawe, Runyon, & Mwafongo, 2012). In high-income countries, in recent years, RTI death and disability rates have significantly decreased due to improved infrastructure, prevention, and treatment methods; however this is not the case for low- and middle-income countries (LMICs) where the injury burden has continued to increase (McGreevy et al., 2014). Countries in Africa have the highest RTI

mortality rate in the world at an average of 24.1 deaths per 100,000 populations compared to 18 deaths per 100,000 populations globally and 8.7 deaths per 100,000 population in high-income countries (WHO, 2013a). It is estimated that road traffic fatality rates will continue to increase annually by 8%, possibly turning RTI into the fifth leading cause from the tenth leading cause of DALYs lost globally by 2030 (McGreevy et al., 2014; Murray et al., 2012).

Along with injuries, various maternal conditions and complications of communicable and non-communicable diseases also often require EMS; these represent about 36% of deaths and disabilities in LMICs (Disease Control Priorities Project, 2008). The need for accessible and reliable emergency care in LMICs is clear but often lacking due to scarce resources and insufficient structure for EMS system (Hsia, Mbembati, Macfarlane, & Kruk, 2012; Smith & Haile-Mariam, 2005).

In upper-middle and high-income countries EMS has been crucial in serving as one of the most important public health services that helped reduce the number of deaths due to cardiac, cerebrovascular, and severe trauma (Roudsari, Nathens, Arreola-Risa, et al., 2007). In recent years, the need for EMS system establishment has been proposed to meet essential health needs and to reduce death and disability in LMICs as well.

There are 15 components essential to developing an EMS system that have been identified in the United States (US) EMS services Development Act of 1973: communications, training, manpower, mutual aid, transportation, accessibility, facilities, critical care units, transfer of care, consumer participation, public education, public safety agencies, standard medical records, independent review and evaluation, and disaster linkage (Baez, Pozner, Perez, & Sosa, 2009; Shah, 2006; VanRooyen, Thomas, & Clem,

1999). These components must be developed and linked through a systematic approach to successfully establish an EMS system. In countries where there is not a formal EMS system already in place, development should be rolled out in phases (Arnold & Holliman, 2005; VanRooyen et al., 1999).

A well-established EMS system not only reduces deaths and disability caused by injuries and acute illnesses in the short-term, but it can also serve as a social safety net to respond to large-scale emergencies and disasters, which any country can benefit from. EMS development in the international development business sector has mainly focused on supporting existing infrastructure through building facilities, donating equipment, or by developing emergency medicine (EM) through training of the public or first responders on first aid skills (Hess, Thomas, Contreras, & Green, 2004; Hisamuddin, Hamzah, & Holliman, 2007; Reynolds et al., 2012). These approaches that concentrate on a component of EMS system is convenient for conducting development work as donors can focus more on the immediate impact of their work. However, because of this it often fails to integrate into the EMS system in the long-term; a new emergency department (ED) cannot be fully functional unless there are properly trained health care workers and a new ambulance alone cannot serve its purpose unless there is proper infrastructure or personnel in place for it.

EMS development in this sense should be linked to the systematic development of emergency medical components, which first requires an assessment of the target region's emergency medical resources and personnel distribution, as well as an evaluation of the EMS environment and the legal and institutional environment to operate in. To evaluate the effectiveness of the EMS system being built and to promote sustainable development, a systematic monitoring of the development process is also necessary. For this, periodic

evaluation of emergency medical resources, the demand for such resources, and the process of emergency medical treatment must take place. These results should then be fed back into continuous policy development for it to be linked to appropriate EMS system development.

Health care in Cameroon is a three-tiered pyramidal system where each level is made up of administrative, finance, and community participation (Figure 1) (Fokunang et al., 2011; Tantchou Tchoumi & Butera, 2013). The three levels are central (strategic), intermediate (technical), and operational (peripheral). The national health system is headed and regulated by the Ministry of Public Health (MoPH) and is made up of various public and private health service organizations and institutions (Tantchou Tchoumi & Butera, 2013). There is practically no health insurance for the general population, except for civil servants, putting great financial burden on families whenever someone in the family becomes ill. On the contrary, the government covers a small portion of the health care costs for civil servants (Tantchou Tchoumi & Butera, 2013).

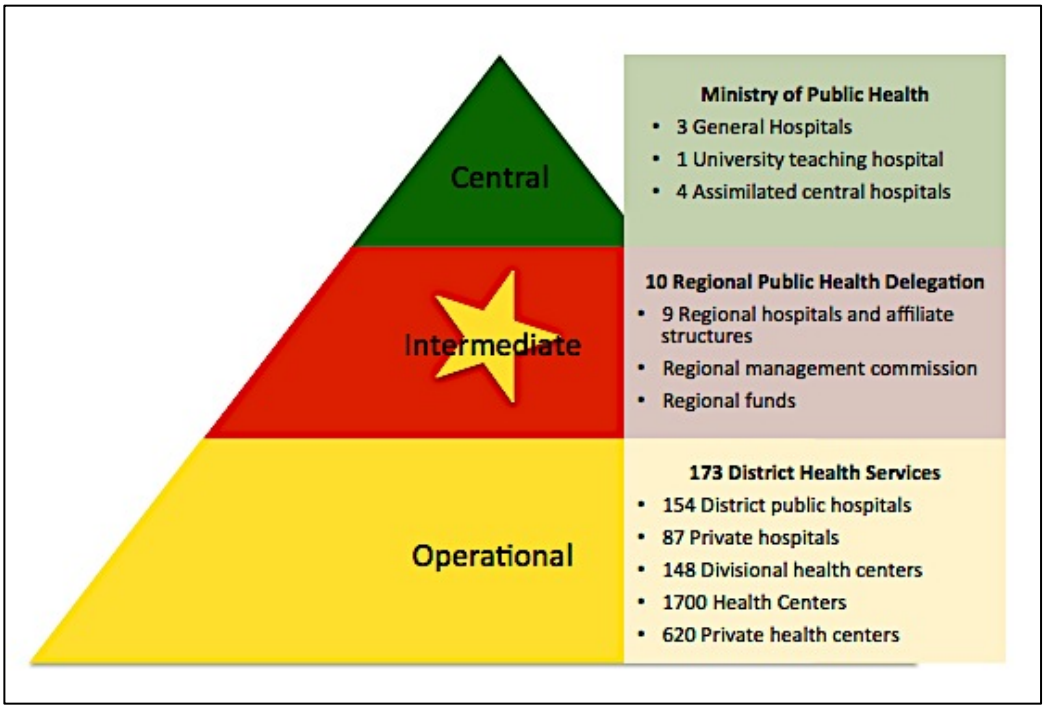

Figure 1. Organization of Cameroon's health care system

1.2 Problem Statement

In Yaoundé, there are currently five hospitals with tertiary care centers of which four have emergency departments (EDs) and three of those hospitals receive trauma patients (Jeong, 2014; Juillard et al., 2011). Despite the existence of EDs, Yaoundé has limited capacity to handle and provide effective emergency medical care due to lack of specialists and well-equipped facilities (Binam et al., 2002; Tantchou Tchoumi & Butera, 2013). Inadequacy of the EMS system became apparent after Cameroon suffered several disasters, including a catastrophic fire that broke out at a fuel storage facility in Yaoundé Nsam district in 1998 that killed 229 people after two tanker trains collided (Arnold & Holliman, 2005; Fonzouk, 2008; Jeong, 2014). The Nsam fire disaster prompted the government to put more effort into developing EM as a medical specialty and as a result, a new two-year training program in EM was created between 2000 and 2001 at the School of

Medicine and Biomedical Science of the University of Yaoundé I (Binam et al., 2002; Jeong, 2014). The program includes providing training on topics such as Basic Life Support (BLS), Advanced Cardiac Life Support, trauma, and disaster response. Approximately 75 physicians have completed the training program as of 2014 and 25 are currently enrolled.

With the new training program additional physicians with EM training are being added to the workforce to increase emergency care capacity but not much has been done to improve emergency care infrastructure. In 2009 the MoPH proposed a project to build a National Emergency Center next to the Central Hospital of Yaoundé. It has since been named Yaoundé Medico-Surgical Emergency Center (YMSEC) (Figure 2). The project to fund the building and development of an emergency center was accepted by Korea International Cooperation Agency (KOICA) the same year and was approved by the Korean government in 2010. The project was initially proposed as an infrastructure development project, where KOICA would assist with the construction of an emergency center. However, once the construction began and plans for the opening of the emergency center started to take place, the need for a baseline assessment of the existing EMS system was immediately recognized. Construction of a new emergency center might improve emergency care infrastructure in Yaoundé, but how it would align with the existing system was unclear since no baseline information on the current EMS system is available. It is crucial that we understand the current status of EMS system first in order to provide future recommendations to strengthen the EMS system further and to reduce the injury and other disease burdens (McGreevy et al., 2014).

To obtain baseline information on Cameroon's EMS system and to predict utilization of the National Emergency Center, Seoul National University Hospital's (SNUH) Laboratory

of Emergency Medical Services (LEMS) that is collaborating with Cameroon's MoPH and KOICA has suggested a four-pronged approach. The project will involve 1) training of medical staff; 2) assessment of existing workforce; 3) community surveys; and 4) collection of information on EMS resources and utilization at existing EDs in Yaoundé, the focus of this special study project. This manuscript should be of interest to those interested in global emergency care or EMS development initiatives in LMICs, especially in the sub-Saharan African region.

Figure 2. Main Entrance of the Yaoundé Medico-Surgical Emergency Center

1.3 Purpose of the Study

There is no published information on the current status of the EMS system or emergency care resources available in Cameroon. The purpose of this study was to conduct a baseline assessment of the EMS system resources in Yaoundé, Cameroon. Information such as patient volume, patient demographic characteristics, ED visit characteristics, and ED utilization at existing hospitals can serve as baseline information to better plan for the

opening of YMSEC. The goal of this study was to collect baseline information on EMS system and EMS resources to be used for developing YMSEC and the national EMS system. Information and data were obtained through literature review, key informant interview, resource surveys, and patient demographic and satisfaction surveys. A summary of the findings was compiled into a comprehensive report in Korean and English that will be translated into French, and a presentation for KOICA and SNUH.

Objective

To assess EMS needs in Yaoundé in order to inform the integration of the new National Emergency Center into the EMS system of care in Cameroon.

Specific Aims

1) To describe the EMS system environment in Cameroon.
2) To identify key strengths and weaknesses in Cameroon's EMS system.
3) To describe the current partnership between KOICA and Cameroon's MoPH.
4) To determine the number and type of emergency medical personnel at Yaoundé EDs.
5) To assess facility, equipment, and transportation resource status at Yaoundé EDs.
6) To describe Yaoundé ED patient characteristics.

1.4 Significance of the Study

In Cameroon, there is no baseline information on the status of the current EMS system or the level of existing resources. Describing the partnership between Cameroon's MoPH and KOICA in building and establishing an emergency center in Yaoundé will allow us to get a glimpse of the early stages of EM and EMS development in Cameroon. A resource survey of existing hospital EDs will provide us with baseline information of Cameroon's emergency care resources. The resource survey will be designed based on various WHO

toolkits and therefore we will be able to use the collected ED resource information to compare to WHO standards. Patient demographic and satisfaction survey of patients utilizing the existing EDs will allow us to describe characteristics of patients as well as ED visits. Information collected through the study will be used to better target recommendations on EMS system development appropriate for Cameroon's system.

Chapter II. Literature Review

2.1 Introduction

There is limited published data or research available on emergency medical services (EMS) in Cameroon. In this literature review section we will explore the different models of EMS systems and look at how other sub-Saharan countries have developed their systems to understand where Cameroon's EMS system stands in relation to these countries and make further recommendations for Cameroon's emergency center development project.

2.2 Emergency Medical Services

An Emergency Medical Service (EMS) system is "a comprehensive system which provides the arrangements of personnel, facilities and equipment for the effective, coordinated and timely delivery of health and safety services to victims of sudden illness or injury (Al-Shaqsi, 2010)." An effective EMS system will allow patients quick access to health care personnel and facilities, thereby increasing his or her chance of survival and decreasing the chance of disability, morbidity, or mortality (Olive C. Kobusingye et al., 2006). Oftentimes EMS is given low priority especially in LMICs as EMS is often misconceived as an expensive add-on component of the health care system requiring lots of funds and high technology; sophisticated EMS systems tend to cost a lot, however, not all EMS systems have to cost a fortune (Olive C. Kobusingye et al., 2006). Regardless of its cost, countries should invest in developing a good EMS system to reduce preventable deaths and disabilities as it is considered an "integral part of any effective and functional health care system (Al-Shaqsi, 2010)."

EMS is made up of three main components: care in the community, care en route, and care on arrival at health care facility; any care before arriving at the hospital is defined as pre-hospital level care (Al-Shaqsi, 2010; O. C. Kobusingye et al., 2005; Razzak & Kellermann, 2002). Care in the community refers to the care provided by emergency care practitioners or other health care providers on the incident site or in community health facilities where the patient is treated or triaged, stabilized and transferred to facility with appropriate level of care (Al-Shaqsi, 2010). Care en route refers to the care provided by paramedics, emergency medical technicians (EMTs), and sometimes other health care providers in ambulances or other emergency transport vehicles. Care on arrival at health care facility usually refers to the care and treatment provided at facilities with some emergency care capacity. These components together reduce unnecessary morbidity and mortality by decreasing the time it takes to access care and increasing access to appropriate care at health facilities (Razzak & Kellermann, 2002).

2.3 EMS Models

There are several different EMS models. Most are categorized by the level or method of pre-hospital care delivery. There are two main ways to describe the different models; one way divides pre-hospital care by the philosophy of pre-hospital care delivery and the other divides care by the level of care provided (Al-Shaqsi, 2010).

Franco-German vs. Anglo-American models

The philosophy of pre-hospital care delivery categorizes EMS system into Franco-German and Anglo-American models. These models have been around since around the 1970s.

The Franco-German EMS model is based on the "stay and stabilize" philosophy and usually involves physicians that have been trained in emergency medicine (Al-Shaqsi, 2010). In this model, an emergency physician is usually involved from the pre-hospital emergency care stage and is dispatched to the emergency by land ambulance, helicopter or coastal ambulances directly to patients. The emergency physician is often responsible for stabilizing and treating patients on-site and only when further treatment is required are the patients then transported to health care facilities (Al-Shaqsi, 2010). Because of this, patients are often directly admitted to appropriate departments instead of going through the ED. This model is also seen as advantageous in reducing unnecessary emergency department visits (Al-Shaqsi, 2010). The Franco-German EMS model is mostly used in Europe in countries such as Germany, France, Greece, and Austria (Al-Shaqsi, 2010).

The Anglo-American model is based on the "scoop and run" philosophy where trained paramedics and EMTs are involved rather than a physician (Al-Shaqsi, 2010). This model was originally developed to create a system more appropriate for countries with more limited number of physicians and economic constraints (Dick, 2003). In this model, EMTs and paramedics arrive on-scene, usually by land ambulance, to stabilize and transport patients as quickly as possible to the closest appropriate level health care facility (Al-Shaqsi, 2010). This model is mostly used in countries such as the United States, Canada, New Zealand, and Australia (Al-Shaqsi, 2010).

EMS models by level of pre-hospital care

EMS systems are also categorized based on the level of pre-hospital care provided (Al-Shaqsi, 2010; Roudsari, Nathens, Arreola-Risa, et al., 2007). In this classification, systems are categorized into unorganized pre-hospital care, basic life support (BLS),

advanced life support (ALS), and Doc-ALS EMS systems (Roudsari, Nathens, Arreola-Risa, et al., 2007; Roudsari, Nathens, Cameron, et al., 2007).

BLS systems involve EMTs who are dispatched on-site to patients to provide basic trauma care to patients during transport to health care facility (Roudsari, Nathens, Arreola-Risa, et al., 2007). ALS systems are similar to BLS systems but EMTs in this system provide more sophisticated interventions to patients; this may involve interventions such as intravenous fluid injections and intubation (Roudsari, Nathens, Arreola-Risa, et al., 2007). When a physician is dispatched to on-scene to patients, this is called a Doc-ALS system and in this system physicians are responsible for stabilizing patients in the community and during transport to health facility (Roudsari, Nathens, Arreola-Risa, et al., 2007). BLS, ALS, and Doc-ALS systems are most common in high- middle- income to high- income countries and in most low- and middle- income countries these types of organized pre-hospital care do not exist. When a formal EMS system is lacking in a country or a community they are said to have an "unorganized pre-hospital care" system and patients are mostly transported by laypeople who are not trained in emergency care (Roudsari, Nathens, Arreola-Risa, et al., 2007).

2.4 EMS system development in other sub-Saharan African countries

To develop an EMS system effectively, it should ideally be conducted in three separate phases: analysis, planning, and implementation (VanRooyen et al., 1999). EMS, however, is usually not developed in such a structured way. As in the case of Cameroon, EMS development often follows a devastating disaster in which a community or a country realizes how fragile the health system is in dealing with mass casualties or even just emergencies in general, prompting an organization, a community, or a government body to

decide to do something about it. In Cameroon, the Nsam district fire led to the creation of new emergency medicine training programs and to the construction of an emergency center. EM and EMS system development in Cameroon is still in its infancy; however, with the active involvement of the Cameroonian MoPH and strong Korean partnership, EMS development in Cameroon looks promising. In this section we will explore how other sub-Saharan African countries have developed their EMS system. EM is a relatively new specialty in the field of medicine, even more so in sub-Saharan Africa, and hence there is limited information available on individual country's EMS system development in general. Therefore a comparison was only possible with countries that had published literature on EM or EMS development.

Table 1. Comparison of health system and health expenditure by country (WHO, 2014)

	Income Level[1]	Total expenditure on health (% GDP)[2]	Per capita total health expenditure (PPP int. $)[2]	Per capita government health expenditure (PPP int. $)[2]	Physicians per 10,000 population[3]	Nursing and midwifery personnel per 10,000 population[3]
Botswana	Upper Middle	5.2	814	502	3.4	28.4
Cameroon	Lower Middle	5.4	120	42	0.8	4.4
Ethiopia	Low	4.1	43	21	0.3	2.5
Ghana	Lower Middle	5.3	99	55	1.0	9.3
South Africa	Upper Middle	8.7	930	443	7.8	49.0
Sudan	Lower Middle	6.7	164	50	2.8	8.4
Tanzania	Low	7.4	108	40	0.1	2.4

[1] The World Bank definition
[2] WHO data from 2011
[3] WHO data from 2006 – 2013

Table 1 summarizes the health system and health expenditure statistics of the countries that were selected for comparison in this section. Tanzania, Ghana, and South Africa were selected to see where Cameroon stands in relation to other sub-Saharan African countries with varying income levels (low, lower middle, and upper middle income countries, respectively) in terms of EMS development. These are also the only countries in sub-Saharan Africa where EM and EMS system has been actively developed during the last decade. Ethiopia, Botswana and Uganda have started to follow suit in recent years, although the EM development history is relatively short. We will explore what initiatives have been taking place in these countries.

EMS Development in Tanzania

The United Republic of Tanzania is a low-income country with an estimated population of 50 million and a per capita income around 660 USD (Reynolds et al., 2012; The World Bank, 2014c). Highest proportion of burden of disease is due to infectious diseases and trauma, contributing to the high infant mortality rate and low life expectancy in Tanzania (Nicks, Sawe, Juma, & Reynolds). There are not enough health care workers, and resources such as funds and continuing education that can help retain and further train these health care workers are scarce, exacerbating the Tanzanian health care system and health status (Nicks et al.). In Tanzania, EM as a specialty has not been around for long and hospitals with an acute care area are not equipped or staffed adequately to provide proper emergency care for patients.

In 2010, Tanzania's first public ED opened at Muhimbili National Hospital (MNH) in Dar es Salaam through a partnership between the Ministry of Health and Social Welfare (MOHSW) and Abbott Fund Tanzania (Reynolds et al., 2012). MNH is one of four referral

hospitals located in Tanzania and also serves as the National Hospital that receives referral from the other three referral hospitals as well (Nicks et al.). What initially started as an infrastructure development project also quickly became an emergency care professional training program when the lack of physicians and nurses that specialized in emergency medicine was realized (Reynolds et al., 2012). The program included collaborative emergency care training for trainers program provided by the US, Canadian, and South African academic institutions, as well as an emergency medicine residency program; it is also the only emergency medicine residency program in Tanzania (Reynolds et al., 2012). In 2011, emergency care providers at Muhimbili Hospital also formed an emergency medicine professional organization called the Emergency Medicine Association of Tanzania (EMAT) with the goal of promoting, improving, and disseminating emergency care to other regions of Tanzania through teaching, research, and education (Reynolds et al., 2012).

Other independent EM development projects have also been carried out. Bugando Medical Center (BMC), another referral hospital, has partnered up with Catholic University of Health and Allied Sciences to redesign the emergency center and the medical school curriculum (Nicks et al.). Another notable collaboration on EM development is between Duke University and Kilimanjaro Christian Medical Centre (KCMC) where they have begun conducting training at KCMC's Casualty Centre on acute care management and EM practices (Nicks et al.). Other regional and district hospitals have also been conducting similar projects to integrate EM and acute care into the hospitals' emergency center and general health care practice.

Although EMS system development in Tanzania has been speeding up in recent years, EMS development in the pre-hospital level is still lagging behind. Unlike the EM

specialty development, EMAT development, and EM and acute care integration at hospital levels, not much has happened at the pre-hospital level to improve training of personnel, system, or infrastructure. Standardized training for ambulance drivers or other transport personnel providing en route patient care is almost non-existent and the demand for such services exceed the current equipment, personnel, or infrastructure capacity (Nicks et al.).

EMS Development in Ghana

Ghana is a lower-middle income country with an estimated population of 25.9 million and GDP per capita around 1,604 USD (The World Bank, 2015a; United Nations, 2014). Ghana, like other LMICs, has high trauma mortality rates, where it is estimated to be about 50% higher than in developed or high income countries (C. N. Mock, Tiska, Adu-Ampofo, & Boakye, 2002). RTIs account for majority of the trauma cases and 81% of these RTI cases occur in the pre-hospital setting (Osei-Ampofo et al., 2013). Poor road infrastructure and rudimentary emergency care systems attribute to the high mortality rate, and like Tanzania, infectious diseases also account for majority (66%) of the disease burden (Osei-Ampofo et al., 2013).

In 2001, a football stadium disaster, which killed 126 Ghanaians and injured many more, drove the government to establish a formal EMS system (Osei-Ampofo et al., 2013). The Ghanaian government realized the inadequacy of existing emergency care capacity, as they lacked formally trained EM specialists or pre-hospital level transport system. In 2004, a National Ambulance Service (NAS) was established by the Ministry of Health (MOH) and the Ministry of Interior (Osei-Ampofo et al., 2013). Prior to NAS people relied solely on taxis and private vehicles in case of emergencies (Osei-Ampofo et al., 2013). NAS follows the Anglo-American EMS model and initially started out as a pilot project with seven

ambulance stations but has since quickly expanded to 100 ambulance stations nationwide by 2012 (Martel et al., 2014; Osei-Ampofo et al., 2013). These services, however, are currently limited to the capitals and sub-urban areas and access to such EMS system is still very limited in rural areas (Osei-Ampofo et al., 2013). The Accident and Emergency Center at Komfo Anokye Teaching Hospital (KATH) was established in 2009 by the Ghanaian government in Kumasi, Ashanti Region, to address the high RTI burden by developing a hospital level emergency care (Osei-Ampofo et al., 2013). An EM residency program, the first of its kind among West African countries, was also set up at KATH and a partnership with the University of Michigan Department of Emergency Medicine and the University of Utah Division of Emergency Medicine was formed in the process to aid with the training of EM physicians (Martel et al., 2014; Osei-Ampofo et al., 2013).

Since then, additional partnerships have formed to improve EM access to rural regions of Ghana and to evaluate and improve the existing EMS system. The Ghanaian MOH partnered up with Columbia University's Mailman School of Public Health in 2010 to develop a training program called the Systems Improvement at District Hospitals and Regional Training of Emergency Care (sidHARTe), aimed at training emergency health care workers in rural areas (Martel et al., 2014). In 2012, Emory University Department of Medicine, along with several Ghanaian EM institutions and organizations such as KATH, NAS, and Ghana Emergency Medicine Collaborative, conducted an evaluation and needs assessment on the NAS and the EMS system in the Ashanti region (Osei-Ampofo et al., 2013). These assessments were conducted to improve the hospital referral system, the training program for both the EM residency trainees and NAS EMTs, and ultimately patient health outcome (Osei-Ampofo et al., 2013).

During the last decade, Ghana has made great progress in EM development at every level: EM development at rural areas through sidHARTe, pre-hospital level EMS development through NAS and EMT training programs, and hospital level EM development through the construction of the Accident and Emergency Center at KATH and the establishment of an EM residency program. Ongoing partnerships between organizations within Ghana and international collaborators promise much hope for the future of emergency care in Ghana.

EMS development in South Africa

South Africa is an upper-middle income country located in sub-Saharan Africa with population over 50 million people and GDP per capita around 7,336 USD (The World Bank, 2015b; United Nations, 2014). Mortality rates due to injury and trauma is much higher in South Africa compared to global rates: six times the global homicide rates and two times the RTI mortality rates (Garrib, Herbst, Hosegood, & Newell, 2011; Norman, Matzopoulos, Groenewald, & Bradshaw, 2007). Health care system in South Africa is composed of private and public sectors (Wallis, Garach, & Kropman, 2008; Wen, Geduld, Nagurney, & Wallis, 2011). The public health care sector, which is funded by the government, services more than 80% of the population and the burden of treatment cost is reduced for low-income patients as payments are determined by income level or a patient's ability to pay for the service (Wen et al., 2011). This is also true for ambulance services; EMS care is free for low-income patients (MacFarlane, van Loggerenberg, & Kloeck, 2005).

Emergency medicine as a practice has been around for a while in South Africa, but it was not until the late 1990s that a formal EM structure, the Emergency Medicine Society of South Africa, was formed, and in 2003 EM was finally recognized as a specialty (Wallis et

al., 2008). Prior to this, medical students interested in EM could take exams through the College of Family Practitioners and receive the Diploma in Primary Emergency Care or go through the Division of Emergency Medicine at the University of Cape Town (UCT), which was established in 2001, to obtain a Master of Philosophy degree in EM (Wallis et al., 2008). Once EM became formally recognized as a specialty, South Africa established the College of Emergency Medicine in 2004 and the same year, UCT started to offer a Master of Medicine in Emergency Medicine program (Wallis et al., 2008). This training program was the first EM training program to be established in Africa (Wen, Geduld, Tobias Nagurney, & Wallis, 2012).

Emergency medical services system development efforts in South Africa can be traced back to the late 1970s when a law requiring four provinces to provide ambulance services was passed (MacFarlane et al., 2005). As with the EM specialist-training program, more active movement towards developing a formal EMS system started to take shape in the 1990s. In 1994, new regulations were set in place to revamp the country's ambulance services, national curricula on emergency care was established, and all emergency care workers were now required to register with the South African medical and Dental Council (MacFarlane et al., 2005). What initially started as a pre-hospital level emergency medical care provided by fire departments, EMS system in South Africa has now become much more sophisticated, especially in urban areas, utilizing various ground and air transport systems (MacFarlane et al., 2005). This sophisticated and well-developed EMS system with short response time, highly trained paramedics, and large funding, however, is limited to major urban areas and access to such high quality EMS in rural areas is still disproportionately lower (MacFarlane et al., 2005).

EMS Development in Ethiopia

In Ethiopia, efforts to develop EM first began in the 1990s. In 1996, Ethiopia got its first resuscitation room equipped with BLS equipment and dedicated beds for critical care in the outpatient surgical department of the Black Lion Hospital, which is the main training center for Addis Ababa University's medical students (Germa, Bayleyegn, Kebede, Ducharme, & Bartolomeos, 2013). In the late 1990s EM training workshops were held for select doctors and nurses and has since been occurring almost every year (Germa et al., 2013). In 1999, Ethiopian expatriate physicians and health care professionals living in the US and Canada founded the Ethiopian North American Health Professionals Association (ENAHPA) to address various health care issues in Ethiopia; one of ENAHPA's aim was in EM and EM infrastructure development (ENAHPA, 2015; Germa et al., 2013). Since the early 2000s, workshops, international stakeholder meetings, continuing medical education sessions, and annual international symposia on EM have taken place in collaboration with organizations such as the Addis Ababa Health Bureau, WHO, ENAHPA, Ethiopian Medical Association, the Clinton Foundation, and various American and Canadian university partners (Germa et al., 2013). Ethiopia's first post-graduate EM training program was launched in 2008 at the Addis Ababa University Medical Facility with the help of the University of Wisconsin and University of Toronto, and in 2012 the Ethiopian Society of Emergency Medical Professionals was established (Germa et al., 2013).

Emergency medicine as a medical specialty has been gaining much momentum in Ethiopia with stakeholders at various levels (both in country and overseas) and great progress has been made since the 1990s. However, much of these efforts have been focused around hospital level emergency care in Addis Ababa, the capital of Ethiopia, and not on

establishing national or regional guidelines for triage or standardized training of EMTs (Germa et al., 2013). The Ethiopian Federal Ministry of Health in recent years has begun developing a plan to establish a national EMS system and a paramedic training program, improve ambulance services, and purchase and distribute more ambulances (Germa et al., 2013).

EMS Development in Botswana and Sudan

Botswana and Sudan are also beginning to follow other sub-Saharan African countries' footsteps in developing EM as a specialty.

Botswana, an upper-middle income country in sub-Saharan Africa bordering South Africa, did not even have a medical school prior to 2009 (Caruso, Chandra, & Kestler). Students who wished to pursue a career in medicine had to study abroad and many ended up not returning to Botswana (Caruso et al.). To address the issue with brain draining and shortage of health care providers, Botswana opened its first Medical School in 2009 at the University of Botswana and EM postgraduate training program was also added as a specialty in 2011 (Caruso et al.). Since then, EM has been recognized as a specialty by the Botswana Health Professions Council, the Botswana Society for Emergency Care has been established, a Resuscitation Training Center and a Trauma Research Center have been set up at the University of Botswana, and a committee has been formed to draft a national pre-hospital care policy (Caruso et al.).

Sudan, a lower-middle income country in the northeast region of sub-Saharan Africa, in their interim Constitution states that all citizens are entitled to free primary health care and emergency services such as immunizations, nutrition counseling, family planning, and treatment of injuries and diseases (A-Rahman & Jacquet, 2014). Sudanese

citizens, however, have limited access to even basic health services, let alone emergency care services, as there is a serious lack of functional health facilities or necessary equipment (A-Rahman & Jacquet, 2014). There is also much disparity in the distribution of available medical services due to prolonged regional conflicts (A-Rahman & Jacquet, 2014). To increase efficiency of the existing emergency care system, a triage-based emergency care was introduced in 2001 into the three largest teaching hospitals in Sudan by the Federal Ministry of Health, where nurses started conducting initial assessment of patients to sort out the urgent cases from the non-urgent cases to decrease morbidity and mortality due to treatment delay (A-Rahman & Jacquet, 2014). The emergency care system, however, still lacked the proper infrastructure and personnel to deliver proper emergency care (A-Rahman & Jacquet, 2014). Recognizing this issue, select few nurses and doctors were sent to Malaysia to receive training and degree in EM starting from 2001, and in 2011 an EM residency program was established at the Omdurman Teaching Hospital (A-Rahman & Jacquet, 2014).

2.5 Summary

Emergency medicine is a relatively new specialty in the field of medicine and even more so in LMICs in sub-Saharan Africa. The highest rates of injury, trauma, infectious disease, and child/maternal mortality are observed in sub-Saharan African countries and these countries have begun to recognize the need and importance of developing EM and EMS systems to reduce preventable deaths and disease burden. Emergency care, mostly limited care, has been available in most of these countries, but EM had not been recognized as a medical specialty in most. High profile national disasters and EM advocacy activities

(both nationally and internationally) have prompted countries such as South Africa, Tanzania, and Ethiopia to push for EM and EMS system development in recent years.

Many of these countries started the development process by beginning to establish EM societies, EM training programs, and emergency centers, often with the help of international partner organizations. Most of these programs, however, have been concentrated in and around each nation's capital or large cities, while rural areas have generally been neglected. With the limited amount of resources countries and organizations have available to invest in EMS development, countries have often focused on targeting areas with high population density, greater number of established hospitals, and a large number of health care workers to get the greatest return on their investment. These programs have indeed increased accessibility and quality of emergency care available for residents in the area, but people in these regions generally had some type of emergency or health care services available to them already. Those living in rural areas, on the other hand, had little to no accessible emergency care and most of these programs have not done much to address this yet. In countries like Tanzania and Ethiopia where multiple projects with different national and international stakeholders are being developed concurrently, lack of coordination has also been an issue affecting the efficiency of EMS system development.

Literature on EM and EMS system development in sub-Saharan African countries describe the development history and provide important information on the progress that has been made, challenges that they face, as well as potential lessons or pitfalls for Cameroon to learn from as it develops its EM and EMS system.

Chapter III. Methods

3.1 Study Design

The study consisted of two types of surveys ('resource survey' and 'patient demographic and satisfaction (PDS) survey'), which were conducted between June and July of 2014. Surveys were conducted at the four major referral hospitals in Yaoundé with tertiary care centers and EDs: Central Hospital of Yaoundé (CH), University Hospital of Yaoundé (CHU), General Hospital of Yaoundé (GH), and Obstetrics Gynecological and Pediatric Hospital of Yaoundé (HGOPY).

The study protocol, data collection tools and consent forms were reviewed and approved by Le Comité National d'Ethique de la Recherche pour la Santé Humaine (N°2014/05/457/L/CNERSH/SP). A determination was received from the Emory Institutional Review Board that IRB was not required (eIRB no. IRB00073350).

Resource Survey

The resource survey was adapted from several WHO resources on essential emergency equipment: "Needs Assessment and Evaluation Form for Essential Emergency Equipment in Emergency Room," "WHO Generic Essential Emergency Equipment List," "Prehospital trauma care systems," and "Tool for Situational Analysis to Assess Emergency and Essential Surgical Care" (Sasser, Varghese, Kellermann, & Lormand, 2005; WHO, 2007, 2009, 2011a). For brevity, these documents will be referred to as the first, second, third, and fourth document, respectively, in this section. Basic questions on the availability, maintenance, and policy regarding essential emergency equipment were adapted from the first and fourth documents. The second document contains a list of essential emergency

equipment required for resuscitation and emergency surgical care, which are categorized into capital outlays, renewable items, and supplementary equipment for use by skilled health professionals. It is noted in the document that the list is for small or rural hospitals and health centers to determine if the facility is equipped adequately to provide necessary emergency care, indicating that the equipment and resources listed are what any hospital providing emergency care should have. Therefore, an adapted version of the list was included in our resource survey as well. The third document outlines what the WHO calls the necessary "core strategies, equipment, supplies and organizational structures" for developing prehospital trauma care systems (Sasser et al., 2005). The resource matrix of recommended equipment and supplies at prehospital level was extracted from this document and adapted in our resource survey. These were included to ask each hospital ED about the available equipment and supplies at their prehospital level (e.g. ambulance), and were categorized into the following sections: communication, protection, extrication, immobilization and patient transfer, airway and breathing management, hemorrhage control and skin injuries, burns, diagnosis and monitoring, medicines, and miscellaneous.

The compiled resource survey aimed at assessing available facilities, services, equipment, emergency care protocols, and human resources at the pre-hospital and hospital levels at each hospital ED were drafted in English and the translated to French (Appendix A.1, Appendix A.2). The resource survey was comprised of a total of 58 main questions and included the following sections: interviewee background information, hospital background information, information on the type and/or number of pre-hospital and hospital level health care workers, facilities, services, equipment, clinical laboratory, protocols, equipment maintenance, ambulance, and ambulance equipment.

Resource surveys were conducted with a total of twelve hospital employees from all four hospitals of interest (Table 2). Hospital employees that have worked at the hospital for six-months or longer were eligible to participate in the survey. Potential interviewees were identified during initial site visits to the hospital EDs. Most of the interviewees were recommended by hospital directors or the chief physician in charge of the ED, thus representing a convenience sample and potentially a biased one. Oral consent to participate was obtained prior to the interview date and again on the day of the survey. Surveys were conducted in English or French with a bilingual research assistant present and participants were compensated with 3,000 FCFA upon completion of survey.

Table 2. List of hospitals and hospital employees that participated in the resource survey

Hospital	Personnel Surveyed
Central Hospital of Yaoundé	• Chief of Emergency Department (ED) – Surgical Wing • Chief of ED – Medical Wing • ED Chief Nurse – Medical Wing • ED Registered Nurse – Medical Wing
General Hospital of Yaoundé	• Chief of ED • ED Chief Nurse
Obstetrics Gynecological and Pediatric Hospital of Yaoundé	• Chief of ED • ED Chief Nurse
University Hospital of Yaoundé	• Chief of ED • ED Chief Nurse • ED Registered Nurse • Ambulance Driver

Patient Demographic and Satisfaction Survey

The patient demographic and satisfaction survey was designed to examine the socio-demographic and visit characteristics of patients at major EDs in Yaoundé and to assess satisfaction level with the emergency care services they received. The PDS survey

was composed of 20 questions made up of multiple choice, short answer, and 4- or 5-point Likert-scale questions (Appendix B.1, Appendix B.2).

Surveys were conducted on patients visiting the hospital EDs. Patients visiting the ED for consultation only were excluded and only patients that were being discharged or transferred to other departments or hospitals after receiving treatment were eligible to participate in the survey. Patients younger than 19 years old were only included if they were accompanied by an adult family member and if both the guardian and the participant gave consent to participate. Based on available information on ED patient volume and research timeline we decided to survey a minimum of 25 patients per hospital ED.

Survey dates and times were selected using a venue-based time-space sampling method (Muhib et al., 2001). A list of hospitals with work shifts was initially drafted; all four hospitals' work schedules were divided into dayshifts and nightshifts that were roughly 12 hours each. Initially, three-dayshifts and one-nightshift were randomly selected for each hospital ED. During initial site visits the survey dates were shared with the head nurse and physician in charge, at which point all but one hospital, the Central Hospital, indicated that majority of patients were discharged in between shifts in the morning and throughout the day. With this new information the survey team decided to only survey during dayshifts at CHU, GH, and HGOPY. At CH surveys were conducted during one-nightshift and remaining dates during dayshifts. For hospitals that did not reach the goal of 25 patients by the end of the fourth survey date, additional survey dates were randomly selected and surveys were conducted until meeting this goal.

Survey participants were recruited at each hospital ED on the day of the survey. Investigator and research assistant recruited study participants by reading the information

sheet to potential study participants. Oral consent was obtained prior to beginning the survey. Surveys were conducted in English or French with a bilingual research assistant present at all times and participants were compensated with 1,000 FCFA upon completion of the survey.

3.2 Data Analysis

This study was purely descriptive with some qualitative information. PDS surveys were entered into Epi Info and analyzed using SAS 9.3 and Excel software. Descriptive statistics were calculated to present patient demographic characteristics, ED visit characteristic, and satisfaction level. The Cameroon's Demographic and Health Survey (DHS) data for 2011 was used to compare the ED patient demographic characteristic to the national statistics. DHS data was analyzed using SPSS version 22.0 and for population estimation the SPSS Complex Sample Module (IBM SPSS Inc., Chicago, IL, USA) was used. Excel software was also used to summarize the resource survey data. Patients' comments from the survey were entered and analyzed using MAXQDA.

3.3 Limitations

This study was not without limitations. The resource surveys were only conducted with Yaoundé's EMS system at the tertiary-care centers and therefore cannot be generalized to the rest of Cameroon. There could have been over-reporting of available resources at each hospital ED as these were self-reported by survey participants and investigators were not able to visually confirm everything in person. Due to time and resource constraints, the sample size for PDS surveys was small and therefore cannot be generalized to the whole patient population. Although it cannot be generalized to the whole EMS system of Cameroon, there has been no baseline assessment of the current EMS

system and resource in Yaoundé, or Cameroon at all for that matter prior to this study. This study therefore may serve to help stakeholders and policy makers understand the current status of Cameroon's EMS system at the highest level. The EMS system status and resource level should be continually monitored and similar project should be conducted in other regions of the country as well as at various levels of medical care to fully understand the dynamics of EMS in Cameroon.

Chapter IV. Results

4.1 Partnership between KOICA and Cameroon's Ministry of Public Health

South Korea in the 1960s and 1970s had a per-capita GDP similar to (or lower than) LMICs in Sub-Saharan Africa and was still struggling decades after the Korean War (UNdata, 2015). Korea relied heavily on foreign aid to finance much of everything from deficit payments to funding economic and social development (KOICA, 2015). Since then, for the last 30 years, Korea developed at the fastest rate the world has ever seen, became a high-income country, and a member of the Organization for Economic Cooperation and Development in 1996 (KOICA, 2015). As quickly as South Korea developed into one of the world's largest economies from one of the poorest and underdeveloped, other countries became interested in receiving consultation and technical support from Korea (KOICA, 2015).

KOICA, Korea International Cooperation Agency, was launched in 1991 as an agency providing assistance in international development and has since been assisting LMICs around the world in various sectors such as education, rural development, industry, energy, and health (KOICA, 2015). In 2010 KOICA Cameroon and Cameroon's MoPH signed a project agreement to construct a National Medico-Surgical Emergency Center in Yaoundé. KOICA's goal was "to contribute to the health development of Cameroon and to the renowned image of the Republic of Korea by ameliorating medical emergency response in the city of Yaoundé in the framework of co-operations between the two countries (KOICA, 2009)" The initial proposal of the project included the construction of the building, provision of necessary and appropriate equipment, provision of technical and managerial human resources, provision of practical training of emergency medicine, and development

of guidelines for the operation and management of the center on KOICA's part. Cameroon's MoPH was responsible for providing all administrative and technical assistance throughout the project.

Once a specialist with expertise in EM and public health became involved with the project towards the end of the construction phase, the need for baseline information on the current status of emergency care and utilization of EDs was realized. This information was considered to be critical for the set-up of the new emergency center and also for future monitoring and evaluation of Cameroon's EMS system development. KOICA invited SNUH and JW Lee Center for Global Medicine to help with the baseline assessment of EM and EMS system in Yaoundé. The research team at SNUH and JW Lee Center for Global Medicine proposed a study with four different components.

The first part of the study was the baseline assessment of EMS system and EDs in tertiary hospitals of Yaoundé, of which the methods and results are described in this paper. The second part of the study was a more in-depth ED utilization survey at the Central Hospital of Yaoundé (CH), which is where YMSEC is being built by. Once YMSEC becomes fully established emergency patients that would regularly get sent to CH's ED will be redirected to the new emergency center. Although YMSEC's purpose is to serve a wider range of patients, with its state of the art equipment and facilities, it is most likely that they will be serving mostly CH's ED patients, at least in its initial phase. Having information on the current patient characteristics, visit reasons, and diagnoses can help predict future utilization of the new emergency center. The third component of the study was an EM/EMS competency assessment of health care workers to develop appropriate and effective EM training program (which is aimed at increasing capacity of those that are already part of

the workforce and not students) based on their current EM knowledge and skills. The self-assessment was conducted between October and November of 2014 at the beginning of a weeklong EM education workshop on doctors and nurses that MoPH selected as potential YMSEC employees. A scenario based competency assessment was also developed, tested, and administered to complement the self-assessments. Finally, an EMS system demand survey was conducted November 2014. This community-based survey was conducted on Yaoundé residents residing near the YMSEC to assess the demand and utilization of ED and to determine existing barriers to accessing emergency care.

4.2 EMS Environment

As a part of the baseline assessment of Cameroon's EM and EMS system, Cameroon's EMS environment was assessed through the resource survey and key informant interviews. Questions regarding Cameroon's EMS Acts or EM related laws, special EMS fund, communication system, and hospital payment systems were included.

The Department of Disaster and Emergency Services (DDES) was established in 2005 to respond to human and natural disasters by implementing disaster risk management policies set by the President of Cameroon and the National Council for Civil Protection (Ndille & Belle, 2014). DDES, however, serves mostly to respond to disaster and does not function in disaster risk reduction, nor does it focus on EM or EMS system. Cameroonian government's interest in EM is relatively new and there are currently no regulations or established national guidelines for emergency medical care.

Service d'Aide Médicale Urgente (SAMU), part of Cameroon's EMS communication system under MoPH's Department of Health Organization, is based on the French model of providing on-site care and was first established in 2003 to identify callers requiring

immediate medical response (Ze Minkande et al., 2009). Funded by the MoPH, SAMU-Yaoundé is run by anesthesiologists, nurses, ambulance staff, and operators/dispatchers utilizing 4 functioning ambulances. No formal curricula exist to train these ambulance staffs and most only receive BLS training by medical school professors. The dispatcher transfers calls that may need medical consult or intervention to the health care worker on duty who then determines if an on-site intervention is necessary (Ze Minkande et al., 2009). During the first three years of operation between 2004 and 2007, only 4% of the calls received required on-site intervention while 3% of the calls were prank calls and 61% were of people requesting non-medical information (Ze Minkande et al., 2009). Since then, the average number of calls SAMU receive per day has dropped dramatically from an average of 20 calls/day in 2004 to 5 calls/day in 2014. The drop in the number of calls is thought to be due to several different factors: lack of public knowledge, cost, and private ambulances operated by hospitals. SAMU in recent years has been seriously underfunded and underutilized.

At the hospital level, each hospital ED receives support with special funds from each hospital for critical patients that are financially disadvantaged; usually the attending physician or head nurse can make recommendations and have the patients apply for such funds. Other than this, however, there are no national or regional level EM/EMS funds available. The hospital payment system in Cameroon is based on a pre-payment policy where patients have to pay for the service first before they can receive any form of care. With the exception of severe trauma patients presenting extensive injuries or other medical conditions that require immediate attention, patients are required to pay first before a physician can examine them. There is also no national health insurance system

that patients can utilize to help offset burdensome medical costs. There are a few private insurance and employer insurance schemes that do exist but these are rarely used by the general population and majority of patients pay 100% out-of-pocket; 99% of our survey participants paid for the service with cash while only 1% of survey participants reported having some form of employee insurance through the hospital (these patients were nurses that worked at the hospital).

4.3 Hospital and ED personnel characteristics

Hospitals in Yaoundé are categorized into public, parapublic (private hospital that receives some public funding), private, confessional private, and secular private hospitals; there are a total of 36 public, 4 parapublic, one private, 25 confessional private, and 132 secular private hospitals (total of 198 hospitals) in Yaoundé. Yaoundé is divided into 7 districts (Yaoundé 1 to Yaoundé 7) but is also often categorized into 6 districts where 1 and 5 are grouped together as one (named Djoungolo district). Yaoundé 7 is the only district without any hospital. Other districts have anywhere from 15 hospitals (Yaoundé 3) to 50 hospitals (Yaoundé 6) in each district.

All hospitals included in this study were public hospitals except for HGOPY, which was the only parapublic hospital with an ED. CHU was the only hospital located outside of the Djoungolo district (Yaoundé 6). GH had the smallest ED with only 2 beds and CH had the largest ED and the most number of beds with two separate wings (surgical and medical). Table 3 summarizes the health care personnel distribution at each hospital ED.

Table 3. Emergency Department (ED) Resources in Yaoundé, Cameroon

Human Resources	Central Hospital				General Hospital		HGOPY		CHU	
	Surgical ED		Medical ED		ED		ED		ED	
	FT	PT	FT	PT	FT	PT	FT	PT	FT	PT
Doctors, general physicians	0	0	3	9	4	0	4	6	1	0
Doctors, specialists	1	0	0	0	2	2	0	0	1	0
Doctors, interns and residents	*Many on Rotation		0	0	1	0	0	0	2-3*	0
Nurses, registered	4	0	12	0	3	0	10	0	8	0
Nurses, assistant	12	0	13	0	1	0	5	0	9	0
Clinical/Health Officers	0	0	0	0	0	0	1	0	0	0
Radiology technicians	0	0	0	0	0	0	0	0	0	0
Laboratory technicians	0	0	0	0	0	0	0	0	0	0
Pharmacists, licensed	0	0	0	0	0	0	0	0	0	0
Pharmacy technicians	0	0	0	0	0	0	0	0	0	0
Respiratory therapists	0	0	0	0	0	0	0	0	0	0
Paramedical staff	0	0	0	0	0	0	7	0	0	0
Support staff (admin, clerks, etc.)	1	0	0	0	0	0	0	0	0	0

*Underestimated number = interns and residents are not properly represented as they work at EDs on a rotation basis

4.4 Pre-hospital Level EMS Resources

4.4a Human Resources

To assess the level of pre-hospital level human resources available at each hospital ED of interest, the resource survey included questions on the number of first responders, ambulance drivers, ambulance care assistants, EMTs, emergency medical dispatchers,

paramedics, critical care paramedics, and paramedic practitioners. Except for HGOPY, all other survey respondents answered that their hospital ED did not have any dedicated pre-hospital level EMS health care worker besides an ambulance driver or answered that they did not know. HGOPY reported having one first responder, three ambulance drivers, two EMTs, one emergency medical dispatcher, one paramedic, two critical care paramedics, and two paramedic practitioners; survey participants also added that some people held more than one position.

All four hospitals reported owning three to four ambulances; however, with the exception of HGOPY not all ambulances were functional. Several ambulances were out of order and had been sitting idle for a long time. CH, GH, HGOPY, and CHU each had three, two, three, and one functioning ambulance. HGOPY reported having the most amount of the surveyed pre-hospital level emergency care resources and equipment (82%) and CH, GH, and CHU reported a much lower proportion at 59 – 61 % (Table 4). The categories of equipment and resources lacking in most hospital ambulances were extrication (58% or less) and cardiac monitor and defibrillator (50% or less). Hemorrhage control and skin injuries and diagnosis and monitoring were two categories most hospitals were relatively well equipped with (75% or higher).

Table 4. Available ambulance equipment and resources by hospital

Hospital	Communications (n = 1)	Protection (n = 15)	Extrication (n = 12)	Immobilization and patient transfer (n = 5)
CH	0 (0%)	12 (80%)	1 (8%)	5 (100%)
GH	1 (100%)	7 (47%)	1 (8%)	3 (60%)
HGOPY	1 (100%)	13 (87%)	4 (33%)	4 (80%)
CHU	1 (100%)	4 (27%)	7 (58%)	5 (100%)

Hospital	Airway and breathing management (n = 20)	Cardiac monitor and defibrillator (n = 8)	Hemorrhage control and skin injuries (n = 16)	Burns (n = 3)
CH	10 (50%)	0 (0%)	14 (88%)	1 (33%)
GH	11 (55%)	3 (38%)	15 (94%)	2 (66%)
HGOPY	20 (100%)	4 (50%)	16 (100%)	3 (100%)
CHU	12 (60%)	4 (50%)	14 (88%)	2 (66%)

Hospital	Diagnosis and monitoring (n = 8)	Medicines (n = 11)	Miscellaneous (n = 8)	Writing material (n = 4)
CH	6 (75%)	7 (64%)	6 (75%)	4 (100%)
GH	7 (88%)	11 (100%)	2 (25%)	3 (75%)
HGOPY	8 (100%)	10 (91%)	5 (63%)	4 (100%)
CHU	7 (88%)	9 (82%)	3 (38%)	0 (0%)

* (n = ##): indicates the total number of items included in each category

4.5 Hospital Level EMS Resources

4.5a Human Resources

To assess the level of ED human resources at the hospital level, questions regarding the number of health care workers and technicians working at the ED were asked on the survey. CH, being the largest hospital in the city and the country, had the most number of employees. At all the hospitals, ED was composed mostly of general physicians, interns and residents as well as registered nurses and assistant nurses. None of the EDs had any pharmacy, laboratory, radiology technicians, or EM specialists. Because hospitals have

laboratories and pharmacy outside of the ED as part of the main hospital, personnel in this area were not considered to be part of the hospital level emergency care staff.

4.5b Emergency Department Facilities

Twelve different facilities/specialized rooms were included in the questionnaire to assess the level of emergency care facilities available at each hospital. The survey included yes/no questions and asked if the ED was equipped with an independent burn care unit, a computed tomography (CT) room, an ear, nose and throat (ENT) examination room, an infection isolation room, a laboratory area, an obstetrical and gynecologic (OBGY) room, an observation room, an ophthalmology examination room, a radiology room, a resuscitation room, a triage room, and/or an ultrasonography room.

All four EDs were relatively small and did not have many specialized rooms within the department. CH, GH, HGOPY, and CHU each reported having 33% (n = 4), 17% (n = 2), 17% (n = 2), and 8% (n = 1) of facilities asked on the survey, respectively. None of the hospitals had a burn care unit, CT room, ENT examination room, laboratory areas, OBGY room, ophthalmology examination room, radiology room, or ultrasonography room. Survey participants reported that patients requiring such services would be transferred directly to other appropriate departments instead of being seen at their ED.

4.5c Emergency Care Protocol

Existence of seven specific basic emergency care protocols (critical pathways) were included in the questionnaire to assess the level of available written emergency care protocols at each ED. Survey participants were asked if their ED had written protocols on acute myocardial infarction, acute stroke, severe or multiple trauma, infectious disease,

disaster or multiple casualty incident, overcrowding of emergency room, and patient triage available for health care workers to access any time.

CHU reported having 43% (n = 3), CHU and GH reported having 71% (n = 5), and HGOPY reported having 86% (n = 6) of the emergency care protocols available at each ED. Some mentioned that additional protocols existed but not in a written form; whenever new employees are hired, managers or head nurses are responsible for training them on those emergency care protocols. Others have also reported that written protocols do exist, however, they are outdated and some haven't been updated for the last 10 years or more.

4.5d Emergency Department Equipment and Supplies

The level of equipment and supplies available at each ED was assessed. This section of the survey was designed based on the WHO Generic Essential Emergency Equipment List (WHO, 2011a). List of equipment and supplies were categorized into capital outlays, which included 23 items (n = 23), supplementary equipment (n = 10), renewable items (n = 15), and cardiac monitor and defibrillator (n = 8). Capital outlays included equipment such as ventilator, electrocardiogram (ECG), and pulse oximetry. Supplementary equipment included equipment such as Magills forceps, endotracheal tubes, and intravenous fluid (IV) bags. Renewable items included items such as nasogastric tubes, light source, and tourniquet. Cardiac monitor and defibrillator included more specific items in which some were under the capital outlays and included equipment such as 3 lead ECG, 12 lead ECG, and blood pressure monitor.

HGOPY reported having the highest proportion of the surveyed items at 95% and CHU had the least (30%). Resource survey respondents also mentioned that patients and caretakers are generally expected to directly purchase and bring in renewable items

themselves from hospital pharmacies or from outside of the hospital. Although most EDs have stocks of some of the renewable items, these are only emergency stocks to be used with critical/time-sensitive cases. Table 5 describes the available ED equipment and supplies by category by hospital.

Table 5. Available essential equipment and supplies by hospital emergency department

Hospital n (%)	Capital Outlays (n=23)	Supplementary Equipment (n=10)	Renewable Items (n=15)	Cardiac Monitor and Defibrillator (n=8)
CH 38 (68%)	20 (87%)	4 (40%)	14 (93%)	0 (0%)
GH 50 (89%)	22 (96%)	9 (90%)	14 (93%)	5 (63%)
HGOPY 53 (95%)	23 (100%)	7 (70%)	15 (100%)	8 (100%)
CHU 17 (30%) 22 (39%)*	9 (39%)	1 (10%)	7 (47%) *12 (80%)	0 (0%)

* Including supplies that patients bring themselves but are also stocked in ED as emergency backup stock

4.6 Patient Socio-demographic Characteristics

Overall, a total of 103 patients participated and completed the PDS survey (Table 6). Socio-demographic characteristics of survey participants are described in Table 7. Patient gender composition varied by hospital ED (CH and CHU EDs had more male patients than female patients and HGOPY, an obstetrics and gynecology hospital, had all female patients) but overall roughly an equal proportion of male and female patients participated in the survey. The mean age of patients was 40.5 years. Majority of patients were married, employed, earned wages between 5,000 – 40,000 FCFA per week (equivalent to 9 – 72 USD per week), identified as being ethnic Cameroon Highlander or other, spoke French as a primary language, and practiced Christianity (Table 7) (CIA, 2014). Education level of the

survey participants was higher than the national average or the Yaoundé average, which were both obtained through analyzing the 2011 Cameroon DHS dataset; the national average of people with higher than secondary education was approximately 3.5% and the Yaoundé average was 12.4%, while it was closer to 30% within our survey population.

Table 6. Number of patients that participated in the PDS survey

Hospital	Total Surveyed	Completed Survey N (%)	Days Surveyed
Central Hospital of Yaoundé	32	27 (84.3)	4
General Hospital of Yaoundé	29	26 (89.7)	4
Obstetrics Gynecological and Pediatric Hospital of Yaoundé	28	25 (89.3)	7
University Hospital of Yaoundé	27	25 (92.6)	6
Total	**116**	**103 (88.8)**	**21**

Table 7. Overall sociodemographic characteristics of patients visiting ED in Yaoundé, Cameroon (N = 103)

	N	%	Yaoundé	Cameroon
Gender[1]			Pop Est. (95% CI)	Pop Est. (95% CI)
Female	52	50.5	52.4% (47.0, 57.7)	51.1% (49.7, 52.5)
Male	51	49.5	47.6% (42.3, 53.0)	48.9% (47.5, 50.3)
Age[2], mean ± SD		40.5 ± 17.8		*Median*
Male (n=51)		39.9 ± 17.8		18.2
Female (n=52)		41.1 ± 17.9		18.4
Ethnicity[2]				
Cameroon Highlander	40	38.8		31
Equatorial Bantu	8	7.8		19
Kirdi	-	-		11
Fulani	10	9.7		10
Northwestern Bantu	2	1.9		8
Eastern Nigiritc	3	2.9		7
Other	40	38.8		13
Primary Language[2]				
French	92	89.32	*Francophone*	*Official*

English	3	2.91	*Region*	*Official*
Other	8	7.77		
Religion[2]				
Christianity	95	92.23		40
Islam	8	7.77		20
Marital Status[1]				
Single, never married	37	35.92	52.7% (51.0, 54.4)	46.0% (45.5, 46.5)
Married or domestic partnership	54	52.43	40.0% (38.3, 41.7)	44.6% (44.1, 45.1)
Widowed	11	10.68	4.0% (3.4, 4.7)	6.3% (6.1, 6.5)
Divorced	1	0.97	3.3% (2.8, 4.0)	3.0% (2.9, 3.2)
Employment Status				
Employed for wages	33	32.04		
Self-employed	31	30.10		
A Homemaker	14	13.59		
A Student	17	16.50		
Retired	7	6.80		
Unable to work	1	0.97		
Weekly Income Level				
<5,000 FCFA	7	6.8		
5,000-9,999 FCFA	17	16.5		
10,000-14,999 FCFA	11	10.68		
15,000-19,999 FCFA	15	14.56		
20,000-39,999 FCFA	17	16.5		
40,000-59,999 FCFA	9	8.74		
60,000-99,999 FCFA	3	2.91		
100,000+ FCFA	8	7.77		
Don’t Know	16	15.53		
Education Level[1]				
No Education, preschool	4	3.88	18.7% (17.6, 19.8)	34.5% (34.1, 34.9)
Elementary School (1-6 Years)	23	22.33	27.5% (26.2, 28.8)	38.3% (37.9, 38.7)
Secondary School (7-10 Years)	25	24.27	41.3% (39.8, 42.7)	23.6% (23.3, 23.9)
Secondary School (11-13 Years)	20	19.42		
College or Associate's Degree	11	10.68	12.4% (11.5, 13.4)	3.5% (3.4, 3.7)
Post College or Graduate Degree	19	18.45		
Don't Know	1	0.97	0.2% (0.1, 0.3)	0% (0.0, 0.1)

SD = Standard Deviation

[1] Yaoundé and Cameroon National statistics comes from DHS Cameroon data (2011)

[2] Data Source: US CIA country profile

4.7 Hospital ED Visit Experience

Most patients visited hospital EDs that were within their district of residence. CHU and CH had the most number of patients coming from outside of Yaoundé. Majority of patients reported arriving at the hospital ED using private transportation such as taxis and personal vehicles (83%). Less than 9% of patients arrived at the hospital on an ambulance (n = 9) and these patients were either transferred from other hospitals or were transported to hospital ED by their employer's private ambulance; none of the patients reported utilizing SAMU. Average travel time was around 68 minutes, however, this varied a lot by hospital. GH had the shortest average travel time at 23 ± 22.1 minutes and CH had the longest average travel time at 119 ± 287.5 minutes, which was attributable to the larger proportion of patients coming from outside of Yaoundé to the CH. Patients were asked to report the reason for visiting the ED and to estimate when symptom(s) first started (or how long they waited before deciding to visit the ED). Majority of patients visited the ED with nonspecific complaints such as fatigue, nausea, and fever (46%) and vehicular trauma and acute abdomen were the second and third most common complaints at 16% and 12%, respectively. Details of chief complaints broken down by hospitals are shown in Table 8 and Figure 3. Other presenting symptoms included non-vehicular trauma, respiratory problems, maternal emergencies, and others. Overall, 38% (n = 39) of survey participants presented with an acute complaint (i.e. symptom onset < 1day), 24% (n = 25) with a recent complaint (i.e. symptom onset 1 – 3 days), and 17% (n = 17) with a subacute complaint (i.e. symptom onset 4 – 14 days).

Table 8. Patients' chief complaints (presenting symptoms) by hospital

Hospital	Chief Complaints	Frequency (%)
Central Hospital of Yaoundé (n = 27)	1. Trauma (Vehicular)[2]	9 (33)
	2. Others (Nonspecific complaints)[1]	6 (22)
	3. Trauma (Non-vehicular)	4 (15)
General Hospital of Yaoundé (n = 25)	1. Others (Nonspecific complaints)[1]	15 (60)
	2. Acute Abdomen[3]	3 (12)
	2. Trauma (Non-vehicular)	3 (12)
Obstetrics Gynecological and Pediatric Hospital of Yaoundé (n = 25)	1. Others (Nonspecific complaints)[1]	16 (64)
	2. Acute Abdomen[3]	4 (16)
	3. Maternal Emergencies	3 (12)
University Hospital of Yaoundé (n = 26)	1. Others (Nonspecific complaints)[1]	10 (38)
	2. Trauma (Vehicular)[2]	7 (27)
	3. Acute Abdomen[3]	6 (23)

[1] Overall, the most common chief complaint in Yaoundé EDs
[2] Overall, the second most common chief complaint in Yaoundé EDs
[3] Overall, the third most common chief complaint in Yaoundé EDs

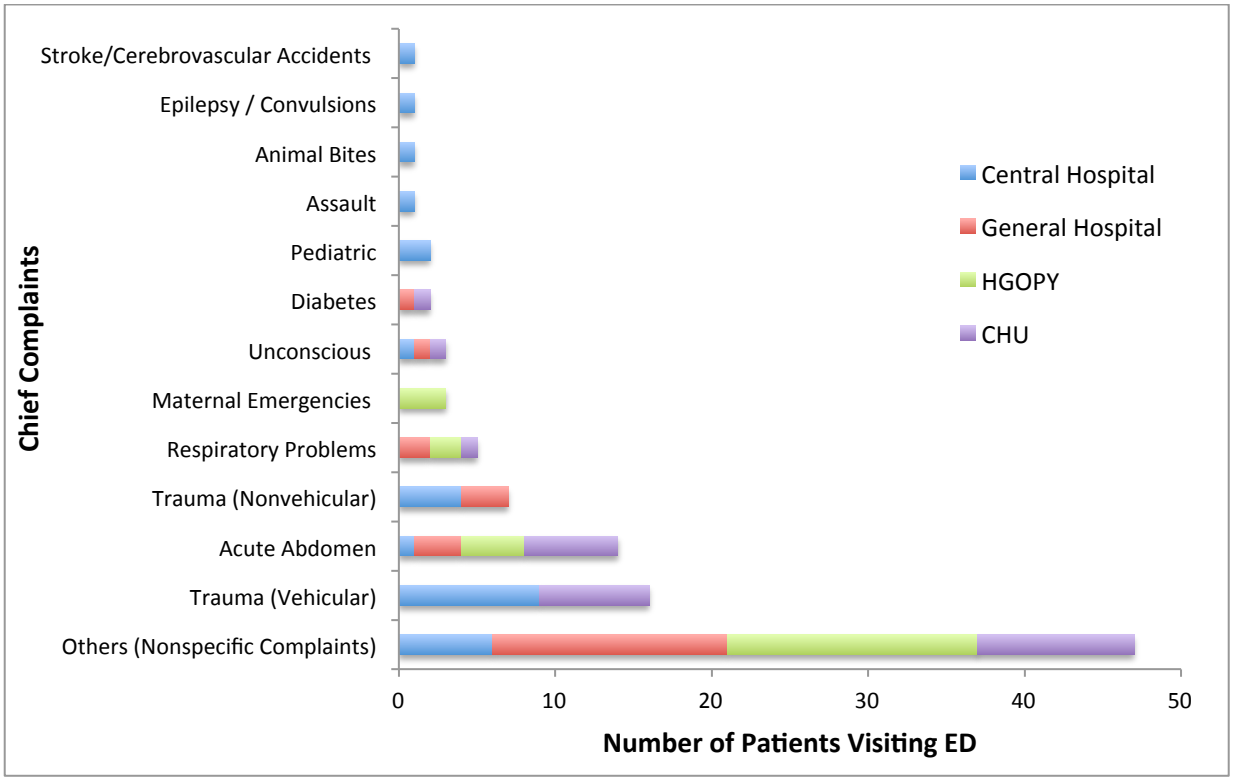

Figure 3. Number of patients visiting ED and their chief complaints by hospital

Majority of the patients reported being satisfied or somewhat satisfied of the service they received at the ED regardless of the hospital they visited; overall 66% of patients reported feeling satisfied of their ED visit and 21.4% were somewhat satisfied of the visit (Figure 4). PDS survey participants had two opportunities to indicate any dissatisfaction of emergency care service or opinions on potential areas of improvement. Participants who did not respond that they were satisfied or somewhat satisfied with the care that they received at the ED were asked to specify the issues they had at the EDs. Participants were asked to select all applicable reasons from a list of 11 common complaints, which were then categorized into three main categories for analysis: standard of care, communication, and organization/logistics. The second place where patients could express dissatisfaction was at the end of the survey, at which point they were asked to give any additional comments or suggestions. The most common reason for complaint and dissatisfaction was due to logistics and organizational reasons (46%) – specifically the long waiting time. Issues and dissatisfactions experienced by ED patients are summarized in Table 9.

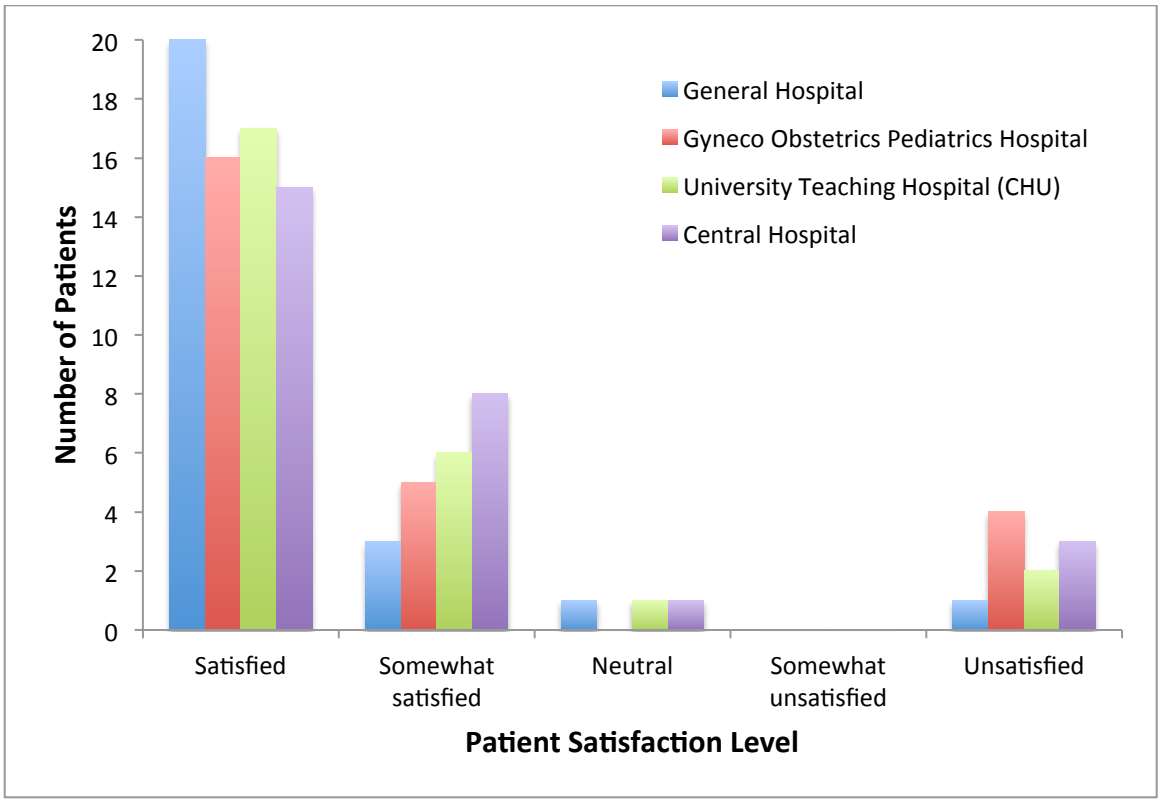

Figure 4. Patient satisfaction level on ED visits in Yaoundé, Cameroon by hospital ED (n = 103)

Table 9. Main issues / dissatisfaction experienced by patients visiting EDs in Yaoundé

Main Categories of Complaint (n=24)	Subcategory	Frequency	Percentage
Standard of care (n=5)	Misdiagnosis, missed or delayed diagnosis	2	8.3%
	Inappropriate and/or inadequate treatment	0	0%
	Inappropriate and/or inadequate examination and/or investigation	3	12.5%
Communication (n=7)	Rudeness or insensitive/inappropriate remarks	0	0%
	Poor or inadequate communication, including inadequate update on medical condition	4	16.7%
	Conduct and attitude	3	12.5%
Organization/logistics (n=11)	Waiting time	6	25%
	Billing/cost issues	1	4.2%
	Admission related issues	1	4.2%
	Patient flow issues	0	0%
	Lack of interim care while awaiting doctor's review or admission	3	12.5%
Other (n = 1)		1	4.2%

Chapter V. Discussion / Conclusion

Discussion

A significant portion of deaths and disabilities due to traumatic injuries, infectious diseases, and acute illnesses can be prevented with a good EMS system in place. Interest in developing EM has been slowly growing in Cameroon. Since the fire disaster in Nsam district in 1999, MoPH has invested in establishing an EMS communication system, SAMU, in 2003, and a new two-year EM training program was created between 2000 and 2001 at the School of Medicine and Biomedical Science of the University of Yaoundé I. In 2009, the MoPH and KOICA began collaborating on a project to build and develop a national emergency center, YMSEC, to improve emergency care infrastructure and to use the center as a training ground for future emergency specialists. In order to inform the integration of YMSEC into the EMS system of care in Yaoundé, this project aimed to conduct an assessment of the current EMS environment, emergency department resources, patient demands and utilization through surveys and key informant interview.

Interest in developing an EMS system in Cameroon is evident; within the last 15 years, SAMU, EM specialist training program, and a new emergency center have been established. Cameroon, however, still lacks the appropriate environment to fully develop an EMS system. Currently there are no specific regulations or national guidelines in place for emergency medical care. Cameroon also lacks health insurance systems and there are no special payment systems in place for emergency care. EDs operate on a pre-payment system, same as the rest of the hospital system, where patients have to pay for the service before they can receive any form of care. Other than miniscule amounts of special funds available at individual hospitals for a few financially disadvantaged patients, there are no

national or regional level EM/EMS funds available to help reduce the burden of emergency care costs for patients. Abundance of taxis and motor-taxis available in Yaoundé makes medical facilities more accessible compared to rural regions, but even in the city, barrier to prompt care still remains due to the 'pay first treat later' system as well as the burden of cost. A good health system should result in better health outcomes, be responsive and fulfill people's expectations, and be financially fair (WHO, 2000). Cameroon's current system, however, lacks most of these components. Study participants often expressed dissatisfaction of the payment system, saying that treatment of emergency patients should not be delayed because of one's inability to pay. Health care providers also expressed their concerns about how unethical it is to delay treatment of a patient because a person is not able to pay; yet the system does not allow providers to do anything about it. This feeling of hopelessness and helplessness is one of the reasons why many health care providers do not wish to work in the EDs, as they are often left to watch a patient that could have been saved, suffer and die. Without structural change in the EMS environment, Cameroon will continue to struggle to reach WHO's definition of a good health system. In South Africa, EMS care is free for low-income individuals and treatment cost is also often reduced if they fall under the set poverty level (Wen et al., 2011). South Africa's system is in accordance with WHO's goal to achieve universal health coverage for all and Cameroon should also aim to provide quality health care service for all regardless of financial status and the cost of the service should not put patients in "financial ruin" (WHO, 2013b).

The resource survey with health care providers allowed us to describe the resources available at tertiary level hospital EDs in Yaoundé. Even though EM and emergency care exist and EDs are already well established in Yaoundé, there is no formal EMS system in

place except for an underutilized and misused communication system, SAMU. Emergency protocols do exist at all hospitals but many of these protocols are often outdated or only exist in oral form. The level of essential emergency medical equipment and resources available varied greatly by hospital. In terms of capital outlays (e.g. ventilator, pulse oximetry) and renewable items (e.g. nasogastric tubes, light source), most EDs, with the exception of CHU, were equipped with 87% or more of the items surveyed. Previous studies conducted in other LMICs such as Ghana, Vietnam, India, and Mexico have also reported their large hospitals as having partly adequate or adequate level of physical resources for acute resuscitation of emergency patients (C. Mock et al., 2006). Availability of supplemental equipment (e.g. IV bags, endotracheal tubes) and cardiac monitor and defibrillators (e.g. blood pressure monitor, ECG), however, varied greatly by hospital ED and could be better supplied.

All four of the surveyed hospital EDs had ambulances but many were often non-operational, poorly maintained, underequipped, and functioned mainly as patient transport vehicles within their facility rather than in a pre-hospital setting, responding to an emergency. This is also the case for many sub-Saharan African and Asian countries, where ambulances and even paramedical personnel are not used in pre-hospital care settings, but rather solely used in transferring of patients within or between facilities (O. C. Kobusingye et al., 2005).

The PDS survey allowed us to describe the characteristics of patients that are currently utilizing EDs in Yaoundé. Slightly over 50% of our patient participants earned an income at or above Cameroon's GDP per capita (1,329 USD) and over 70% of the patient participants completed secondary education or higher. The average education level in

Yaoundé is generally higher than the rest of the country; however, our patient population was composed of highly educated people even compared to the Yaoundé statistics, with approximately 29% of the participants reported having completed collage/associate degree or higher compared to the 12.4% in Yaoundé and 3.5% in Cameroon. It may be that people who have completed higher education are more likely to believe in science and medicine and rely less on traditional medicine, resulting in a patient population with higher level of education. However, past studies conducted in Sri Lanka and Nigeria have shown that even people who do not believe in modern medicine would often turn to seek care at hospitals for emergency care (Asowa-Omorodion, 1997; Razzak & Kellermann, 2002; Wolffers, 1988). This points to the possibility of socioeconomic status as being a potential source of barrier to accessing emergency care. Additional studies need to be conducted in the communities outside of the hospital to be able to determine if people's knowledge, attitudes, and beliefs influence their decision to seek emergency care and if one's socioeconomic status act as a source barrier to accessing necessary emergency care.

The most common reasons for visiting the EDs were non-specific complaints (46%) and vehicular trauma (16%). A study conducted at an emergency center in western Kenya, a low-income country in sub-Saharan Africa, in 2011 aimed to describe the patient characteristics found that the most common presenting symptoms for acute care were injury related, infectious disease, and mental health disorders at 20.2%, 11.7%, and 11.3%, respectively (House, Nyabera, Yusi, & Rusyniak, 2014). In our study similar rates of injury related cases were observed (24%), however, less cases of infectious disease and mental health disorders were reported. Satisfaction levels were very high at all emergency centers where approximately 87% of the participants reported feeling satisfied or somewhat

satisfied with the service they received, which was much higher compared to other studies conducted in Iran (63%) or Ethiopia (51.7%) (Soleimanpour et al., 2011; Taye, Yassin, & Kebede, 2014). However, what was interesting was that even these patients who reported being satisfied with the service still had negative comments that they wanted to share at the end of the survey. The most common reason for complaint and dissatisfaction was due to logistical and organizational issues (46%), especially the long waiting time in every process. Communication and interaction with the health care provider was also an important part of patients' ED visit experience. Lack of communication was the second most frequently cited reason for dissatisfaction of the ED service while several patients who reported being satisfied with the ED visit commented that they were happy about how the nurse and/or physician was attentive and checked in on them often during their stay, indicating the importance of good communication. In other past studies on patient satisfaction, interpersonal communication has often topped the list of important component of patients' visit experience (Boudreaux & O'Hea, 2004).

Recommendations

The structure of EMS system may vary greatly depending on the kind of prehospital services communities utilize, nevertheless the basic components to have an effective EMS system are essentially the same. EMS system needs to be easily accessible to the public, include a communication system, become integrated into the existing health services with adequate clinical care and appropriate human resources, and requires information systems, EMS research, legislation and regulation, and system finance (NHTSA). Yaoundé has the potential to develop a great EMS system as it already has many of the basic components required for it; there is a communication system in place that is accessible to

the general public, EDs are established within the city with trained health care workers, and the government has recently invested in building a new emergency center in Yaoundé. Although there are plans to train and produce more emergency medicine specialists and health care providers at the emergency center, additional actions must be taken to have an effective EMS system that can help reduce preventable mortalities.

There must be additional funds allocated to better utilize SAMU through public education on the system. Training of not only emergency specialists but also dedicated prehospital level health care workers (EMTs or first responders) is essential. There also needs to be a system to ensure these EM specialists actually end up working at EDs. Currently most physicians who have been trained in EM are not working in EDs and the distribution of this EM trained specialists is unknown. Setting up a system to ensure proper placement of these valuable human resources post-trainings is essential in building a good EMS system. Above all, legal and regulatory actions must be taken to set up better payment systems for emergency care (through an insurance program or special EMS fund) to make emergency care less burdensome for patients.

These structural changes to build and improve the EMS environment in Cameroon are crucial to the establishment and development of EMS system, which can only be done with persistence efforts by the MoPH along with the support of other parts of the health and medical community as well as the Cameroonian government. In the summer of 2014 an international symposium on EMS system was held in Yaoundé, which brought together different sectors of the medical community as well as international partners from Korea and South Africa to discuss the development of EMS system, the role of the new YMSEC, and the future of the Cameroonian EMS system. Similar symposiums should be held annually to

create continuous opportunities to discuss Cameroon's progress on EMS development. Once YMSEC becomes fully operational, the center activities and progress should be monitored and evaluated quarterly or semi annually to assess utilization as well as its contributions to improving patients' health outcomes. This is especially important, as the Yaoundé emergency center is a pilot project that MoPH hopes to expand to other regions of the country as well.

Conclusion

Emergency medicine and EMS is still a relatively new field in Cameroon and is still in the initial development phase. Although emergency care and EDs are relatively well established and well equipped, the appropriate EMS environment and health care workers that have specialized in EM are lacking. In order to develop an effective EMS system the Cameroon MoPH needs to establish appropriate legislation, regulations, and funding system for EMS system to be able to grow. Existing systems such as SAMU also need to be revamped and better utilized through measures such as public education, increased funding, and additional training of personnel. Existing EDs can benefit not only from these structural but also through training and educating of health care workers areas on the current patient needs. These changes will not come easy, especially the structural changes, but the successful systematic development of an EMS system and subsequent establishment of emergency centers in other regions of Cameroon along with YMSEC, can help reduce preventable morbidities and mortalities, increase life expectancy, and improve the overall health status of Cameroonians.

Appendix

List of Abbreviations and Definition of Terms

Abbreviation	Definition
ALS	Advanced Life Support
BLS	Basic Life Support
BMC	Bugando Medical Center
CH	Central Hospital of Yaoundé (Hôpital Central de Yaoundé)
CHU	University Hospital of Yaoundé (Centre Hospitalier et Universitaire de Yaoundé)
DALY	Disability-Adjusted Life-Year
DDES	Department of Disaster and Emergency Services
DHS	Demographic and Health Survey
ED	Emergency Department
EMAT	Emergency Medicine Association of Tanzania
EMS	Emergency Medical Services
EMT	Emergency Medical Technician
ENAHPA	Ethiopian North American Health Professionals Association
ER	Emergency Room
GDP	Gross Domestic Product
GH	General Hospital of Yaoundé (Hôpital Général de Yaoundé)
HGOPY	Obstetrics Gynecological and Pediatric Hospital of Yaoundé (Hôpital gynéco-obstétrique et pédiatrique de Yaoundé)
ICU	Intensive Care Unit
KATH	Komfo Anokye Teaching Hospital
KCMC	Kilimanjaro Christian Medical Centre
KOICA	Korea International Cooperation Agency
LEMS	Laboratory of Emergency Medical Services
LMIC	Low- and Middle- Income Country
MNH	Muhimbili National Hospital
MOH	Ministry of Health
MOHSW	Ministry of Health and Social Welfare
MoPH	Ministry of Public Health
PDS	Patient Demographics and Satisfaction
RTI	Road Traffic Injury
sidHARTe	Systems Improvement at District Hospitals and Regional Training of Emergency Care
SNUH	Seoul National University Hospital
UCT	University of Cape Town
US	United States of America
WHO	World Health Organization

YMSEC	Yaoundé Medico-Surgical Emergency Center

Appendix A.1. Resource Survey and Information

KOICA 한국국제협력단
KOREA INTERNATIONAL COOPERATION AGENCY

Seoul National University College of Medicine
JW LEE Center for Global Medicine

EMORY | ROLLINS SCHOOL OF PUBLIC HEALTH

Sheet (English)

Resource Survey Guide

Date: (DD/MM/YEAR) _____

Interviewer: _____

Interviewee: _____

Introduction

Hello, my name is_____. I am a researcher from Emory University working for KOICA (Korea International Cooperation Agency) and JW Lee Global Center for Medicine of Seoul National University College of Medicine with the permission of Cameroon's Ministry of Public Health.

This research is being conducted to get to know your hospital's personnel, facility, service, equipment, and transportation resource availability, distribution and utilization. We are also interested in the available resources in the Emergency Department. If it's all right with you, I'd like to record our discussion to make sure that I don't miss anything that you say. This interview will be kept confidential. No one outside our research team will listen to this recording, and you will never be connected by name to the things you say or as having participated in this interview.

Is it okay if I record our conversation?	YES……1 NO……0

Everything you tell me will only be used for this research project, and your name will not be used,. This interview will take about 60 to 90 minutes. You will receive 3,000 XAF in compensation for your full participation. Upon completion of the interview I will need your signature or initials to confirm that you have received compensation. Do you have any questions before we begin?

Q1. Do you agree to participate?	YES……1 NO……0

First I'd like to start by obtaining your background information.

Q2. What is your gender?	Female..... 1 Male..... 2 Other..... 3 Refused……98 Don't Know……99
Q3. How old are you?	<*write*> _____ Refused……98 Don't Know……99
Q4. What is your education level?	Elementary school (1-6 years)……..1 Middle school (6-9 years) ……..2 High school (10-12 years)……..3 College or Associate's Degree……..4 Post college or graduate Degree……5 Other (*specify*):_____ ……96 Refused……98 Don't Know……99
Q5. Which hospital do you work for?	<*write*> _____
Q6. What is your position / job title at the hospital?	<*write*> _____
Q7. How long have you worked at this hospital?	<*write*> _____
Q8. How long have you worked in the Emergency Department?	<*write*> _____

I'd like to ask you about some basic information about the overall hospital.

Lets start with hospital infrastructure.

Q9. How many beds does your hospital have?	<*write*> _____
Q10. How many patients are admitted on average every year? **(Prompt: How many patients were admitted last year?)**	<*write*> _____
Q11. What is the number of total outpatients in one year?	<*write*> _____
Q12. How many functioning major and minor operating rooms do you have?	<*write*> _____
Q13. How many patients at this facility require major & minor surgical procedures per year including obstetric and gynecological procedures?	<*write*> _____
Q14. Is there running water at the hospital?	YES……1 If yes: Sometimes / All the time NO……0
Q15. Is there electricity source?	YES……1 If yes: Sometimes / All the time NO……0
Q16. Do you keep medical records?	YES……1 If yes: Sometimes / All the time NO……0

Now I'd like to ask about the types and number of staff the hospital employs.

Q17. Please indicate the number of health staff in the following categories. How many of the following types of full-time and part-time staff does the hospital employ?

		Full-Time (35hr/wk +)	Part-Time (<35hr/wk)
A	Doctors, general physicians		
B	Doctors, specialists		
C	Doctors, interns and residents		
E	Nurses, registered		
F	Nurses, assistant		
G	Clinical/Health Officers		
H	Radiology technicians		
I	Laboratory technicians		
J	Pharmacists, licensed		
K	Pharmacy technicians		
L	Respiratory therapists		
M	Paramedical staff		
N	Support staff (administrators, clerks, etc.)		

Now I'd like to ask information about the available facilities and/or services available at your hospital.

		Yes (1)			**No (0)**
	Does your hospital have the following facilities and/or services?	**Yes (1)**	**How many rooms are designated for this service?**	**How many beds are designated for this service?**	**No (0)**
18.1	**General Medical-Surgical Care <If no, skip to next question>**				
A	Adult medical-surgical care				
B	Pediatric medical-surgical care				
C	Medical-surgical intensive care				
D	Burn care				
E	Arthritis treatment center				
F	Geriatric services				
G	Wound management services				
H	Primary care department				
18.2	**Emergency, Trauma or Urgent Care <If no, skip to next question>**				
A	Emergency department				
B	Pediatric emergency department				
C	Trauma center				
D	Ambulance services				
E	Urgent care center				

		Yes (1)			No (0)
	Does your hospital have the following facilities and/or services?	**Yes (1)**	**How many rooms are designated for this service?**	**How many beds are designated for this service?**	**No (0)**
18.3	**Infectious Diseases <If no, skip to next question>**				
A	Airborne infection isolation room				
B	HIV/AIDS services				
18.4	**Cardiovascular Care <If no, skip to next question>**				
A	Adult cardiology services				
B	Adult diagnostic catheterization				
C	Adult interventional cardiac catheterization				
D	Adult cardiac surgery				
E	Adult cardiac electrophysiology				
F	Cardiac rehabilitation				
G	Cardiac intensive care				
18.5	**Endocrinology / Endoscopic Services <If no, skip to next question>**				
A	Optical colonoscopy				
B	Endoscopic ultrasound				
C	Ablation of Barrett's esophagus				
D	Esophageal impedance study				
E	Endoscopic retrograde cholangio pancreatography (ERCP)				
18.6	**Surgical Services <If no, skip to next question>**				
A	Ambulatory surgery / Outpatient surgery center				
B	Computer assisted orthopedic surgery (CAOS)				
C	Extracorporeal shock wave lithotripter (ESWL)				
D	Robotic surgery				
18.7	**Radiology, diagnostic <If no, skip to next question>**				
A	CT Scanner				
B	Diagnostic radioisotope facility				
C	Electron beam computed tomography (EBCT)				
D	Full field digital mammography (FFDM)				
E	Magnetic resonance imaging (MRI)				
F	Intraoperative magnetic resonance imaging				
G	Multi-slice spiral computed tomography (<64+slice CT)				
H	Multi-slice spiral computed tomography (64+slice CT)				
I	Positron emission tomography				

		Yes (1)			No (0)
	Does your hospital have the following facilities and/or services?	**Yes (1)**	**How many rooms are designated for this service?**	**How many beds are designated for this service?**	**No (0)**
	(PET)				
J	Positron emission tomography/CT (PET/CT)				
K	Single photon emission computerized tomography (SPECT)				
L	Ultrasound				
M	Virtual colonoscopy				
18.8	**Radiology, therapeutic <If no, skip to next question>**				
A	Image-guided radiation therapy (IGRT)				
B	Intensity-modulated radiation therapy (IMRT)				
C	Proton beam therapy				
D	Shaped beam radiation system				
E	Stereotactic radiosurgery				
18.9	**Transplant services <If no, skip to next question>**				
A	Bone marrow				
B	Heart				
C	Kidney				
D	Liver				
E	Lung				
H	Other (specify): _____				
18.10	**Oncology services <If no, skip to next question>**				
A	Chemotherapy				
B	Oncology services				
18.11	**Orthopedics <If no, skip to next question>**				
A	Orthopedic services				
18.12	**Women's Health <If no, skip to next question>**				
A	Obstetrics				
B	Fertility clinic				
C	Birthing room/LDR room/LDRP room				
D	Women's health center/services				
E	Breast cancer screening/mammograms				
18.13	**Psychiatric services / Mental Health <If no, skip to next question>**				
A	Psychiatric child-adolescent services				
B	Psychiatric consultation-liaison services				
C	Psychiatric education services				

		Yes (1)			No (0)
	Does your hospital have the following facilities and/or services?	**Yes (1)**	**How many rooms are designated for this service?**	**How many beds are designated for this service?**	**No (0)**
D	Psychiatric emergency services				
E	Psychiatric geriatric services				
F	Psychiatric outpatient services				
G	Psychiatric partial hospitalization services				
H	Psychiatric residential treatment				
I	Alcoholism-drug abuse or dependency care				
J	Crisis prevention				
K	Social work services				
L	Support groups				
18.14	**Pediatrics <If no, skip to next question>**				
A	Neonatal intensive care				
B	Neonatal intermediate care				
C	Pediatric diagnostic catheterization				
D	Pediatric cardiology services				
E	Pediatric cardiac electrophysiology				
F	Pediatric intensive care				
G	Pediatric cardiac surgery				
H	Pediatric interventional cardiac catheterization				
18.15	**Pain Management <If no, skip to next question>**				
A	Pain management program				
B	Palliative care program				
C	Palliative care inpatient unit				
D	Patient controlled analgesia (PCA)				
18.16	**Physical Medicine & Rehabilitation <If no, skip to next question>**				
A	Physical Rehabilitation care				
B	Assistive technology center				
C	Electrodiagnostic services				
D	Physical rehabilitation outpatient services				
E	Prosthetic and orthotic services				
F	Robot-assisted walking therapy				
G	Chiropractic services				
H	Sports medicine				
18.17	**Community Improvement / Outreach <If no, skip to next question>**				
A	Community outreach				
B	Fitness center				
C	Health fair				
D	Community health education				
E	Health screenings				

		Yes (1)			No (0)
	Does your hospital have the following facilities and/or services?	**Yes (1)**	**How many rooms are designated for this service?**	**How many beds are designated for this service?**	**No (0)**
F	Immunization program				
G	Indigent care clinic				
H	Linguistic/translation services				
I	Mobile health services				
J	Patient education center				
K	Transportation to health services				
L	Volunteer services department				
18.18	**Extended / Long-term Care <If no, skip to next question>**				
A	Home health services				
B	Assisted living				
C	Intermediate nursing care				
D	Adult day care program				
E	Acute long-term care				
F	Other long-term care				
G	Hospice program				
H	Retirement housing				
I	Hospital-based outpatient care center services				
18.19	**Other Facilities & Services**				
A	Alzheimer Center				
B	Bariatric/weight control services				
C	Blood Donor Center				
D	Case management				
E	Chaplaincy/pastoral care services				
F	Complementary and alternative medicine services				
G	Dental services				
H	Pharmacy				
I	Freestanding outpatient care center				
J	Genetic testing/counseling				
K	Hemodialysis				
L	Neurological services				
M	Nutrition program				
N	Occupational health services				
P	Sleep center				
Q	Tobacco treatment/cessation program				
R	Rural health clinic				
S	Patient representative services				

Now I'd like to ask you about the available resources and equipment at your hospital.

Q19. Please tell me whether the hospital has the following pieces of equipment and how many.

		Yes (1)	How many:	No (0)	Comments
A	Microscope				
B	X-ray machines				
C	CT Scanners				
D	Computers				
E	Generators				
F	Autoclave				
G	Washing machine				
H	Dryer				
I	Other major equipment (specify)				

Q20a. Does the hospital have a laboratory?	YES……1 NO……0 → **skip to Q20f.**
Q20b. If it has a lab, is it open 24/7? **<If the hospital has more than one lab, is at least one of them open 24/7>**	YES……1 NO……0
Q20c. If it has a lab, what are the major types of analyses the lab performs? ***<Select all that applies and also list others>***	Hematology ……1 (ex. CBC and H&H) Chemistry ……2 (ex. Glucose, cholesterol, potassium, etc.) Microbiology ……3 (ex. Cultures of blood, urine, wounds, etc.) Blood Bank ……4 (ex. Blood typing, etc.) Others (specify):

Q20d. Even if the hospital has a lab of its own, does it contract or have some kind of a relationship with another lab to supplement its own capabilities?	YES……1 NO……..0 → **skip to Q21.** Description:
Q20e. Is the lab private or public?	Private ……..1 Public ……..2 Both (Our hospital has contracts/relationships with multiple labs ……..3
Q20f. If the hospital does not have a lab, does it contract or have a relationship of some kind with a laboratory? Please answer Yes/No and describe the relationship.	YES……1 NO……..0 → **skip to Q21.** Description:
Q20g. If it has a contract or a relationship with a lab, is that lab private or public?	Private ……..1 Public ……..2 Both (Our hospital has contracts/relationships with multiple labs) ……..3
Q20h. If it has a contract or a relationship with a lab, are you able to request lab tests 24/7?	YES……1 NO……..0

Now I'd like to ask you about some basic information about the Emergency Department at your hospital.

Q21. Is your Emergency Department open 24/7?	YES……1 NO……0

Q22. Please indicate the number of Emergency Department health staff in the following categories. How many of the following types of full-time staff does the hospital employ? How many of those are stationed 24/7?

		Number of Full-Time Staff (35hr/wk +)	Number of Part-Time (<35hr/wk)	Number of Staff Stationed 24/7
a	Doctors, general physicians			
b	Doctors, specialists			
c	Doctors, interns and residents			
d	Nurses, registered			
e	Nurses, assistant			
f	Clinical/Health Officers			
g	Radiology technicians			
h	Laboratory technicians			
i	Pharmacists, licensed			
j	Pharmacy technicians			
k	Respiratory therapists			
l	Paramedical staff			
m	Support staff (administrators, clerks, etc.)			

Next I'd like to ask about the different specialized rooms available at your Emergency Department.

Q23a. Is there a triage area or room for screening the acuity?	YES……1 NO……0
Q23b. Is there an independent operating room?	YES……1 NO……0
Q23c. Is there an independent procedure room?	YES……1 NO……0

Q24. Is there any resuscitation room for providing resuscitation procedure for life threatening conditions?	YES……1 NO……0
Q25. Is there any observation room or area for designated for postoperative care?	YES……1 NO……0
Q26. Is there any *independent* laboratory room or facility for emergency laboratory test?	YES……1 NO……0
Q27. Is there any *independent* radiology room or facility for emergency radiology test?(simple x-ray test)	YES……1 NO……0
Q28. Is there any *independent ultrasonography* room or facility for emergency test?	YES……1 NO……0
Q29. Is there any *independent computed tomography* room or facility for emergency test?	YES……1 NO……0
Q30. Is there any *independent OBGY examination* room or facility for emergency obstetric or gynecologic patients care?	YES……1 NO……0
Q31. Is there any *independent ENT examination* room or facility for emergency ear, nose, and throat examination?	YES……1 NO……0
Q32. Is there any *independent Opthalmology examination* room or facility for emergency eye examination?	YES……1 NO……0

Now I'd like to ask about the available equipment at your Emergency Department.

Q33. Is there a list of essential emergency care equipment?	YES……1 NO……0

Q34. The following is the list of essential emergency care equipment. Is the following available?

		Yes (1)	No (0)	Unknown (99)
	Capital Outlays			
A	ECG Machine			
	Patient Monitoring Machine			
B	Blood Pressure			
C	ECG			
D	Oxygen Saturation (Pulse oximetry)			
E	Ventilator			
F	Resuscitator bag valve and mask (adult)			
G	Resuscitator bag valve and mask (pediatric)			
H	Oxygen source (cylinder or concentrator) with mask and tubing			
I	Stethoscope			
J	Suction pump (manual or electric) with catheter			
K	Thermometer			
L	Scalpel with blades			
M	Retractor			
N	Scissors			
O	Oropharyngeal airway (adult size)			
P	Oropharyngeal airway (pediatric size)			
Q	Forceps, artery			
R	Gloves (sterile)			
S	Gloves (examination)			
T	Needle holder			
U	Sterilizer			
V	Vaginal speculum			
W	Inventory list of equipment and supplies			
X	Best practice guidelines for emergency care			
	Supplementary Equipment for Use by Skilled Health Professionals			
Y	Magills Forceps (adult)			
Z	Magills Forceps (pediatric)			
AA	Endotracheal tubes (adult)			
AB	Endotracheal tubes (pediatric)			

		Yes (1)	No (0)	Unknown (99)
AC	IV infusor bags			
AD	Chest tubes insertion equipment			
AE	Laryngoscope handle			
AF	Laryngoscope Macintosh blades (adult) with bulbs and batteries			
AG	Laryngoscope Macintosh blades (pediatric) with bulbs and batteries			
AH	Cricothyrotomy set			
	Renewable Items			
AI	Nasogastric tubes			
AJ	Light source (lamp & flash light)			
AK	Intravenous fluid infusion set			
AL	Intravenous cannulas/scalp vein infusion set			
AM	Syringes with needles (disposable)			
AN	Sharps disposal container			
AO	Tourniquet			
AP	Needles and sutures			
AQ	Splints for arm, leg			
AR	Urinary catheters (Foleys disposable)			
AS	Waste disposal container			
AT	Face masks			
AU	Eye protection			
AV	Protective gowns/aprons			
AW	Soap			
	Cardiac monitor and defibrillator			
AX	3 lead ECG monitor			
AY	10 lead ECG monitor			
AZ	Non-invasive blood pressure monitor			
BA	SaO2 monitor			
BB	End tidal CO2 monitor			
BC	Defibrillator, manual			
BD	Defibrillator, automatic			
BE	Defibrillator, external pacing			

Now I'd like to ask about equipment maintenance issues at your Emergency Department.

Q35. Are the essential emergency equipments in working order?	YES……1 If yes: Some/All NO……0
Q36. Is there access to repaire if equipment fails?	YES……1 If yes: Some/All NO……0
Q37. Is there access to repair within the health care facility?	YES……1 If yes: Some/All NO……0
Q38a. Is there access to repair outside the health care facility?	YES……1 If yes: Some/All NO……0 → **Q39**
Q38b. If there is access to repair outside the health care facility, approximately how far is it?	1 – 25km ……1 27 – 50km ……2 51 – 200km ……3 200km+ ……4
Q39. Is there an agreement for the maintenance of the equipment with the supplier?	YES……1 If yes: Some/All NO……0
Q40. Do the health care staff in the emergency room get training in the use of the equipment?	YES……1 If yes: Some/All NO……0
Q41. Is information available on supply, repair and spare parts for the equipment?	YES……1 If yes: Some/All NO……0

Q42. Are the protocols for management of essential emergency procedures available?	YES……1 If yes: Some/All NO……0
Q43. Are the protocols for safe appropriate use of equipment in essential emergency procedures available?	YES……1 If yes: Some/All NO……0
Q44. How often is room to room inspection performed to ensure that equipment and supplies required for the essential emergency procedures are available and functioning?	Daily ……1 Weekly ……2 Monthly ……3 6-monthly ……4 Yearly ……5 Once in _____ years ……6 Never ……7
Q45. Are the information, education and training materials on emergency procedures and equipment available in the emergency room for health care staff use?	YES……1 NO……0

Now I'd like to ask about the available emergency care protocols at your hospital.

Q46. Do you have any critical pathway or documented protocol for acute myocardial infarction?	YES……1 NO……0 I DON'T KNOW ……99
Q47. Do you have any critical pathway or documented protocol for acute stroke?	YES……1 NO……0 I DON'T KNOW ……99
Q48. Do you have any critical pathway or documented protocol for severe trauma or multiple trauma?	YES……1 NO……0 I DON'T KNOW ……99

Q49. Do you have any critical pathway or documented protocol for infectious disease?	YES……1 NO……0 I DON'T KNOW ……99
Q50. Do you have any critical pathway or documented protocol for disaster or multiple casualty incident?	YES……1 NO……0 I DON'T KNOW ……99
Q51. Do you have any critical pathway or documented protocol for overcrowding of emergency room?	YES……1 NO……0 I DON'T KNOW ……99
Q52. Do you have any critical pathway or documented protocol for patient triage?	YES……1 NO……0 I DON'T KNOW ……99

Now I'd like to ask about pre hospital emergency care / EMS resources. First I'd like to start by asking the types and number of staff that are part of the pre hospital emergency care.

Q53. Please indicate the number of pre hospital level staff in the following categories. How many _____ do you have at your hospital? How many of those are stationed 24/7?

		Full-Time (35hr/wk +)	Number of Staff Stationed 24/7
a	First responder		
b	Ambulance driver		
c	Ambulance care assistant		
d	Emergency medical technician		
e	Emergency medical dispatcher		
f	Paramedic		
g	Critical care paramedic		
h	Paramedic practitioner / Emergency care practitioner		
i	Registered nurse		
j	Physician		

Q54. Does your hospital or your patients utilize the SAMU system?	YES……1 NO……0 I DON'T KNOW ……99
Q55a. Does your hospital have ambulances?	YES……1 NO……0 → **Skip to Q56** I DON'T KNOW ……99
Q55b. If yes, how many ambulances does your hospital have?	<*write*> _____
Q56a. Does your hospital receive emergency calls from patients?	YES……1 NO……0 → **Skip to Q57** I DON'T KNOW ……99
Q56b. If yes, how many calls do you recieve per year?	<*write*> _____
Q57. Does your hospital dispatch ambulances to pick up emergency patients?	YES……1 NO……0 I DON'T KNOW ……99

Q58. Is each ambulance equipped with the following supplies?

		Yes (1)	No (0)	Unknown(99)
	EMS Equipment and Supplies			
	Communications			
AA	Wireless communication (e.g. radio, mobile phone)			
	Protection			
AB	Non-sterile single-use gloves in size medium – large			
AC	Eye protection (plastic or glass goggles with side shields)			
AD	Light-reflective clothing (e.g. waistcoat) for identification and protection			
AE	Flags or other traffic control devices			
AF	Torch plus spare batteries and bulb or reflector or candle			
AG	Soap or bactericidal foam for hand washing			
AH	Cleaning solution			

		Yes (1)	No (0)	Unknown(99)
AI	Towel			
AJ	Protective clothing, gowns or aprons			
AK	Disinfectant solution for equipment			
AL	Plastic bags for non-biohazard waste			
AM	Waterproof matches			
AN	Incineration bags for biological waste			
AO	Fire extinguisher			
AP	Sharps container			
	Extrication			
	Basic extrication equipment			
AQ	Machetes			
AR	Crowbars			
AS	Car jacks			
	Other extrication equipment			
AT	Shears			
AU	Saw			
AV	Rope			
AW	Shovel			
AX	Protective clothing			
AY	Short-board for extrication			
	Specialized extrication equipment			
AZ	Cutters			
BA	Spreaders			
BB	Rams			
	Immobilization and patient transfer			
BC	Long, rigid wood, metal or plastic board			
BD	Boards for limb splints			
BE	Stretcher (wooden, plastic or cloth device)			
BF	Head immobilization device			
BG	Cervical collar			
	Airway and breathing management			
BH	Face shield			
BI	Pocket mask (e.g., for mouth-to-mask breathing)			
BJ	Bag-valve-mask			
	Nasopharyngeal and/or oropharyngeal for			
BK	Infants			
BL	Children			
BM	Adults			
BN	Nasal cannula and associated tubing			
BO	Tongue depressor			

		Yes (1)	No (0)	Unknown(99)
BP	Fixed oxygen equipment and administration equipment			
BQ	Non-rebreather face mask			
BR	Suction device (manual or powered)			
BS	Yankauer or other rigid suction tip			
BT	Blind insertion device			
BU	Laryngoscope handle and blades			
BV	Endotracheal tube and connector			
BW	Introducing stylet/bougie			
BX	Splinter forceps			
BY	Esophageal detector device			
BZ	Magill forceps			
CA	Needle and syringe			
CB	Needle for thoracostomy			
	Cardiac monitor and defibrillator			
CC	3 lead ECG monitor			
CD	10 lead ECG monitor			
CE	Non-invasive blood pressure monitor			
CF	SaO2 monitor			
CG	End tidal CO2 monitor			
CH	Defibrillator, manual			
CI	Defibrillator, automatic			
CJ	Defibrillator, external pacing			
	Haemorrhage control and skin injuries			
CK	Potable water			
CL	Bandages			
CM	Elastic bandages			
CN	Gauze rolls			
CO	Compresses			
CP	Absorbent cotton wool			
CQ	Adhesive tape			
CR	Oral rehydration solution			
CS	Blankets			
CT	Adhesive dressing bandage (wound plaster)			
CU	4x4 bandages, triangular bandages			
CV	Arterial tourniquet			
CW	Needles and syringes			
CX	Sterile compresses			
CY	Intravenous infusion set (lines and cannulas)			
CZ	Intraosseous needle or equivalent			
	Burns			

		Yes (1)	No (0)	Unknown(99)
DA	Vaseline or paraffin gauze			
DB	Sterile dressing			
DC	Dressing for burns			
	Diagnosis and monitoring			
DD	Clock or watch with second hand			
DE	Stethoscope			
DF	Blood-pressure measuring device			
DG	Penlight			
DH	Torch (flashlight)			
DI	Thermometer			
DJ	Pulse oximeter			
DK	Electronic cardiac monitoring device			
	Medicines			
DL	Oxygen			
DM	Topical antibiotic dressing			
DN	Diazepam (or equivalent)			
DO	Controlled substances lockbox			
DP	Morphine sulfate			
DQ	Acetylsalicylic acid			
DR	Ibuprofen (or equivalent)			
DS	Paracetamol (acetaminophen)			
DT	50% dextrose solution			
DU	Crystalloid solutions (normal saline)			
DV	Water for injection			
	Miscellaneous			
DW	List of local emergency contacts			
DX	Knife, scissors			
DY	Flask for drinking water or bottles of water			
DZ	Container for supplies and equipment (e.g. shoulder bag, backpack or box)			
EA	Rescue blanket (silver/silver or silver/gold)			
EB	Shovel			
EC	Triage tags			
ED	Lubricating jelly			
	Writing material			
EE	Pencil			
EF	Permanent marker			
EG	Notepad			
EH	Charts for documenting patient care and incident			

Seoul National University College of Medicine
JW LEE Center for Global Medicine

INFORMATION SHEET

PURPOSE

Thank you for participating in this interview. This interview will help us better understand the available resources, needs, and utilization of emergency medical services at existing Emergency Departments in Yaoundé. This interview is being done by a researcher from Emory University – Rollins School of Public Health, in Atlanta GA, and her research assistants as part of the Cameroon EMS system development project. This project has been supported by KOICA (Korea International Cooperation Agency) and Cameroon's Ministry of Public Health. You will receive a compensation of 3,000 FCFA for your participation.

CONFIDENTIALITY

This interview is confidential. Everything you tell me will only be used for this research project, and your name will not be used. You can choose to participate or not participate.

CONTACT INFORMATION
If you have any questions or concerns, please contact us via phone or email as indicated below:

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Appendix A.2. Resource Survey and Information Sheet (French)

KOICA 한국국제협력단
KOREA INTERNATIONAL COOPERATION AGENCY

Seoul National University College of Medicine
JW LEE Center for Global Medicine

EMORY ROLLINS SCHOOL OF PUBLIC HEALTH

Guide d'enquête des Ressources

Date : (JJ/MM/AAAA) _____

Intervieweur (euse) : _____

Interviewé (ée) : _____

Introduction

Bonjour, je m'appelle _____. Je suis une chercheuse de l'université de l'Emory, je travaille pour KOICA (Korea International Cooperation Agency) et JW Lee center for Médecin de Seoul National University College et avec une autorisation obtenu du Ministère de la Santé Publique du Cameroun.

Cette recherche est menée pour déterminer le personnel de l'hôpital, les facilités, services, le matériel, la disponibilité des ressources de transport, leurs distributions et utilisations. Nous sommes aussi intéressés par les ressources disponibles dans le service d'urgence.si vous êtes d'accord de nous accorder un peu de votre temps, nous voudrions bien enregistrer cet interview pour ne pas omettre certains détails que vous donnerez. Cet interview sera maintenu confidentiel .personne en dehors de l'équipe des chercheurs n'aura accès à cet enregistrement, votre nom ne sera mentionné nulle part et aucune connexion ne sera faite entre vous et votre participation à cet interview.

Acceptez-vous que nous enregistrions notre entretien?	Oui……1 Nom……..0

Tout ce que vous direz ne sera utilisé que pour ce projet de recherche, votre nom ne sera mentionné dans ce projet pour éviter toute liaison avec vous et ce que vous direz. Cet entretien dura 60 à 90 minutes. Vous recevrez à la fin de l'interview une récompense de 3.000 FCFA pour avoir participé à cette interview. A la fin de cet entretien, nous aurons besoin de votre signature ou votre initial comme preuve que vous avez reçu votre récompense.
Avez- vous des questions avant qu'on ne commence?

Q1. Acceptez-vous participer?	Oui……1 Nom……..0

J'aimerai d'abord commencer par obtenir vos informations personnelle

Q2.Quel est votre sexe ?	Féminin ……..1 Masculin ……2 Autres ……3 Refus ……..98 Ne sais pas……..99
Q3.Quel est votre âge ?	<écrire> _____ Refus ……..98 Ne sais pas……..99
Q4. Quel est votre niveau d'étude ?	Niveau primaire (1-6ans)……..1 Niveau secondaire (6ème-3ème :7-10ans)…2 Niveau secondaire (2nd-Tle : 11-13aans)…3 Ecole ou diplôme professionnelle……..4 Diplôme universitaire ……..5 Autres (préciser) :_____ ……96 Refus ……..98 Ne sais pas……..99
Q5. Dans quelle structure hospitalière travaillez-vous ?	<écrire> _____
Q6.Quel poste occupez-vous/quel est la nature de votre travail dans cet hôpital ?	<écrire> _____
Q7. Depuis quand travaillez-vous dans cet hôpital ?	<écrire> _____
Q8.depuis quand travaillez vous aux urgences ?	<écrire> _____

J'aimerai d'abord vous poser des questions à propos de l'ensemble de l'hôpital.

Commençons par l'infrastructure de l'hôpital.

Q9. Combien de lits votre hôpital possède t-il?	<écrire > _____
Q10. Combien de malades sont admis en moyenne chaque année? **(Bref: combien de malades ont été admis l'année dernière?)**	<écrire > _____
Q11. Quel est le nombre total de consultation externe en une année?	<écrire > _____
Q12. Combien de blocs opératoires majeurs et mineurs fonctionnels avez-vous?	<écrire > _____
Q13. Combien de blocs opératoires majeurs et mineurs fonctionnels avez-vous?	<écrire > _____
Q14. Ya t-il de l'eau courante dans votre hôpital?	Oui……1 Si oui : parfois/à tout moment Non……0
Q15. Ya t-il une source d'électricité?	Oui……1 Si oui : parfois/à tout moment Non……0
Q16. Gardez-vous des rapports médicaux?	Oui……1 Si oui : parfois/à tout moment Non……0

J'aimerai maintenant savoir le type et nombre de personnel que l'hôpital emploie.

Q17. Veillez indiquer le nombre du personnel soignant dans les catégories suivantes. Combien parmi ces catégories sont employés par l'hôpital et travaille à temps plein?

		Temps plein (35hr/sem. +)	Temps partiel (<35hr/sem)
A	Médecin généralistes		
B	Médecins spécialistes		
C	Médecin, internes et résidents		
E	Infirmiers diplômés d'Etat		
F	Aides soignants		
G	Agent de santé/clinique		
H	Techniciens de radiologie		
I	Techniciens de laboratoire		
J	Pharmaciens, licencié		
K	Technicien de pharmacie		
L	Thérapeute respiratoire		
M	Personnel paramédical		
N	Agent de l'Etat (administrateurs, entretien, etc.)		

J'aimerai maintenant vous poser des questions à propos des avantages disponibles et/ou services disponibles dans votre hôpital.

		Oui (1)			**Nom (0)**
	Possédez-vous ces différents avantages et /ou services dans votre hôpital?	**Oui (1)**	**Combien de salles sont conçus pour ce service ?**	**Combien de lits sont conçus pour ce service ?**	**Nom (0)**
18.1	**Soins médico-chirurgical général <Si non, passer à la proposition suivante>**				
A	Soins médico-chirurgical adulte				
B	Soins médico-chirurgical pédiatrique				
C	Soins intensifs médico-chirurgical				
D	Soins des brulures				
E	Centre de traitement des arthrites				
F	Service de gériatrie				
G	Service de soins des plaies				
H	Département des soins primaire				
18.2	**Urgence, soins traumatique ou premier soins <si non, passer à la proposition suivante>**				
A	Service d'urgence				
B	Service des urgences pédiatrique				

		Oui (1)			Nom (0)
	Possédez-vous ces différents avantages et /ou services dans votre hôpital?	**Oui (1)**	**Combien de salles sont conçus pour ce service ?**	**Combien de lits sont conçus pour ce service ?**	**Nom (0)**
C	Centre de traumatisme				
D	Services d'ambulance				
E	Centre de soins urgent				
18.3	**Maladies infectieuses <si non, passer à la proposition suivante>**				
A	Salle d'isolement des infections aéroportées				
B	Service d' HIV/SIDA				
18.4	**Soins cardiovasculaire <Si non, passer à la proposition suivante>**				
A	Service de cardiologie adulte				
B	Diagnostic de cathétérisme adulte				
C	Cathétérisme des interventions cardiologiques Chez l'adulte				
D	Chirurgie cardiologiques des adultes				
E	Electrophysiologie cardiologique chez l'adulte				
F	Réhabilitation cardiologique				
G	Soins intensifs cardiologiques				
18.5	**Services d'Endocrinologie/ Endoscopie <Si non, passer à la proposition suivante>**				
A	Colonoscopie optique				
B	Echo- Endoscopie				
C	Ablation l'œsophage de Barrett				
D	Etude de l'impédance œsophagienne				
E	Cholangio-pancreatographique retrograde Endoscopique (CPRE)				
18.6	services de chirurgie <si non, passer à la proposition suivante>				
A	service de chirurgie ambulatoire/consultation externe				
B	Chirurgie orthopédique assistée par ordinateur				
C	lithotripsie extracorporelle par ondes de choc (LECOC)				
D	Chirurgie robotique				
18.7	**Diagnostique radiologique <si non, passer à la proposition**				

		Oui (1)			Nom (0)
	Possédez-vous ces différents avantages et /ou services dans votre hôpital?	**Oui (1)**	**Combien de salles sont conçus pour ce service ?**	**Combien de lits sont conçus pour ce service ?**	**Nom (0)**
	suivante>				
A	Scanner TDM				
B	Equipements utilisant des radio-isotopes Pou établir des diagnostiques				
C	Tomodensitométrie à faisceau d'électrons (TFE)				
D	Mammographie numérique plein champ				
E	Imagerie par résonance magnétique (IRM)				
F	Imagerie par résonance magnétique péro-opératoire				
G	Tomodensiométrie multi-coupe ou spirales (<64 coupe tomodensiométrie)				
H	Tomodensiométrie multi-coupe ou spirales (64+ coupe tomodensoimétrie)				
I	Tomographie par émission de positons (TEP)				
J	Tomographie par émission de positons/tomodensiométrie (TEP/Tomodensiométrie)				
K	Tomographie d'émission monophotonique				
L	Echographie				
M	Colonoscopie virtuelle				
18.8	**Radiologie thérapeutique <si non, passer à la proposition suivante)**				
A	Radiothérapie guidé par l'image				
B	Radiothérapie à modulation d'intensité (IMRT)				
C	Proton thérapie				
D	Système de radiation en forme				
E	Système de radiothérapie stéréotaxique				
18.9	**Service de transplantation <si non, passer à la proposition suivante>**				
A	Moelle osseuse				
B	Cœur				

		Oui (1)			Nom (0)
	Possédez-vous ces différents avantages et /ou services dans votre hôpital?	**Oui (1)**	**Combien de salles sont conçus pour ce service ?**	**Combien de lits sont conçus pour ce service ?**	**Nom (0)**
C	Reins				
D	Foie				
E	Poumons				
H	Autres (préciser)_____				
18.10	**Services d'oncologie <si non, passer à la proposition suivante>**				
A	Chimiothérapie				
B	Unité d'oncologie				
18.11	**Services d'orthopédie <si non, passer à la proposition suivante>**				
A	Services d'orthopédie				
18.12	**Santé maternelle <si non passer à la proposition suivante>**				
A	Obstétrique				
B	Unité de fertilité				
C	Salle d'accouchement/salle de travail/suite de couche				
D	Unité/centre de santé maternelle				
E	Cancer de seins Dépistage/mammogramme				
18.13	**Services de psychiatrie/santé mental <si non, passer à la proposition suivante>**				
A	Unité de psychiatrie infantile et de l'adolescent				
B	Unité de consultation psychiatrique et de liaison				
C	Unité d'éducation psychiatrique				
D	Service des urgences psychiatrique				
E	Service de gériatrie psychiatrique				
F	Service de consultation externe psychiatrique				
G	Service partiel d'hospitalisation psychiatrique				
H	Traitement résidentiel psychiatrique				
I	Soins d'indépendance ou d'abus d'alcool-médicaments				
J	Prévention des crises				
K	Services sociaux				
L	Groupe de soutien				
18.14	**Pédiatrie <si non, passer à la proposition**				

		Oui (1)			Nom (0)
	Possédez-vous ces différents avantages et /ou services dans votre hôpital?	**Oui (1)**	**Combien de salles sont conçus pour ce service ?**	**Combien de lits sont conçus pour ce service ?**	**Nom (0)**
	suivante>				
A	Service de soins intensifs néonatal				
B	Soins néonatal intermédiaire				
C	Diagnostique du cathétérisme pédiatrique				
D	Service de cardiologie néonatal				
E	Electrophysiologie cardiaque pédiatrique				
F	Soins intensifs pédiatrique				
G	Chirurgie cardiaque pédiatrique				
H	Cathétérisme pédiatrique cardiaque interventionnel				
18.15	**Gestion de douleur <si non, passer à la proposition suivante>**				
A	Programme sur la gestion de douleur				
B	Programme de soins palliatifs				
C	Unités des soins palliatifs des malades hospitalisés				
D	Contrôle des analgésies des patients				
18.16	**Médecine physique & réhabilitation <si non, passer à la proposition suivante>**				
A	Soins de réhabilitation physique				
B	Centre d'assistance de technologie				
C	Services d'électro diagnostique				
D	Services de réhabilitation des consultations externes				
E	Services prothétique et d'orthèse				
F	Marche assistée à l'aide du robot				
G	Services de chiropractie				
H	Médecine sportive				
18.17	**Amélioration communautaire/services mobiles**				
A	L'approche communautaire				
B	Centre de fitness				
C	Foire de la santé				
D	Education sanitaire communautaire				
E	Dépistages sanitaires				
F	Programme d'immunisation				
G	Clinique des soins d'indigents				

		Oui (1)			Nom (0)
	Possédez-vous ces différents avantages et /ou services dans votre hôpital?	**Oui (1)**	**Combien de salles sont conçus pour ce service ?**	**Combien de lits sont conçus pour ce service ?**	**Nom (0)**
H	Services de traduction/linguistique				
I	Services de santé mobile				
J	Centre d'éducation des patients				
K	Services de transport au centre de soins				
L	Département de service volontaire				
18.18	**Soins à long terme /prolongé <si non, passer à la proposition suivante>**				
A	Service de soins à domicile				
B	Assistance de vie				
C	Soins infirmiers intermédiaire				
D	Programme de soins adulte journalier				
E	Soins à long terme développé				
F	Autre soin à long terme				
G	Programme d'hospice				
H	Maison de retraite				
I	Centre des services hospitaliers de consultation externe				
18.19	**Autres avantages & services**				
A	Centre d'Alzheimer				
B	Service de contrôle du poids/bariatrique				
C	Centre du don de sang				
D	Gestion de cas				
E	Aumônerie/ service de l'accompagnement pastoral				
F	Service de médecine complémentaire et alternative				
G	Service d'odontostomatologie				
H	Pharmacie				
I	Centre autonome des soins ambulatoire				
J	Dépistage génétique/counselling				
K	Hémodialyse				
L	Service de neurologie				
M	Programme de nutrition				
N	Service de médecine du travail				
O	Institut du sommeil				
P	Traitement de la dépendance au tabac/programme d'abandon				
Q	Clinique de santé des régions rurales				
R	Services de représentant des patients				

J'aimerai vous poser des questions à propos des ressources disponibles et matérielles dans votre hôpital.

Q19. Dites moi si l'hôpital possède les appareils suivants et combien.

		Oui (1)	Combien :	Non (0)	commentaires
A	Microscope				
B	Appareil de radiographie				
C	Scanner CT(Tomodensitomètres)				
D	Ordinateurs				
E	Groupes électrogène				
F	Autoclave				
G	Machine à lavé				
H	Séchoir				
I	Autres équipements majeur (préciser)				

Q20a. L'hôpital a-t-il un laboratoire?	Oui……..1 Non……..0 → **passer à Q20f.**
Q20b. Si oui, est-il ouvert 24h/24? **<si l'hôpital a plus d'un laboratoire, ya t-il au moins un ouvert 24h/24 >**	Oui……..1 Non……..0
Q20c. Si l'hôpital a un laboratoire, quelles sont les types d'analyses majeures que le labo effectue ? **<Choisir les mentions correspondantes et citer d'autres >**	Hématologie ……..1 (ex.NFS et Hb) Chimie ……..2 (ex. Glucose, cholestérol, potassium, etc) Microbiologie……..3 (ex. Culture sanguin, urine, plaies, etc.) Banque de sang……..4 (ex. Groupe sanguin, etc.) Autres (préciser) :

Q20d. Même si l'hôpital a son laboratoire, travaille t-il sous une base contractuelle ou a t-il des relations quelconques avec d'autres laboratoires pour accroitre ses capacités?	Oui……..1 Non……..0 → **passer à Q21** Décrire :
Q20e. Le laboratoire est-il privé ou public?	Privé ……1 Public ……..2 Les deux (notre hôpital a des contrats /entretien des relations avec d'autres laboratoires) ……..3
Q20f. Si l'hôpital n'a pas de laboratoire, travaille t-il sous une base contractuelle ou a-t-il des relations quelconques avec d'autres laboratoires ? **Veuillez répondre pas oui ou par non et décrive le genre de relation.**	Oui……..1 Non……..0 → **passer à Q21** Décrire :
Q20g. Si l'hôpital travaille sous une base contractuelle ou a une quelconque relation avec un autre laboratoire, ce laboratoire est-il privé ou public?	Privé ……1 Public ……..2 Les deux (notre hôpital a des contrats /entretien des relations avec d'autres laboratoires) ……..3
Q20h. Si votre hôpital travaille sous une base contractuelle ou a des relations quelconques avec d'autres laboratoires, faites-vous des demandes d'examens de laboratoire 24h/24?	Oui……..1 Non……..0

J'aimerai maintenant vous poser des questions à propos du service des urgences de votre hôpital.

Q21. Votre service d'urgence est-il ouvert 24h/24 ?	Oui……1 Non……0

Q22. Veuillez indiquer le nombre de personnel soignant des services d'urgence dans les catégories suivantes. Combien de ces catégories travaillent-ils à temps plein ? Combien de ceux-ci sont stationnés 24hr/24?

		Nombre de personnel travaillant à temps plein (35hr/sem. +)	Number of Part-Time (<35hr/wk)	Nombre de personnel Travaillant 24h/24
A	Médecin généralistes			
B	Médecins spécialistes			
C	Médecin, internes et résidents			
D	Infirmiers diplômés d'Etat			
E	Aides soignants			
F	Agent de santé/clinique			
G	Techniciens de radiologie			
H	Techniciens de laboratoire			
I	Pharmaciens, licencié			
J	Technicien de pharmacie			
K	Thérapeute respiratoire			
L	Personnel paramédical			
M	Agent de l'Etat (administrateurs, entretien, etc.)			

J'aimerai poser des questions à propos des différents salles spécialisés disponibles dans votre département d'urgence.

Q23. Ya t-il une zone de tri ou salle d'examen d'acuité?	Oui……1 Non……0
Q24. Ya t-il une salle de ressuscitation pour fournir des procédures de ressuscitation pour des maladies atteints d'affections qui diminue le pronostique vital?	Oui……1 Non……0
Q25. Is there any observation room or area for designated for postoperative care?	Oui……1 Non……0

Q26. Ya t-il une salle de laboratoire indépendante ou appareil pour des examens de laboratoire urgent?	Oui……1 Non……0
Q27. Ya t-il une salle de radiologie indépendante ou appareil pour examens de laboratoire urgent?	Oui……1 Non……0
Q28. Ya t-il une salle d'échographie indépendante ou appareil pour examens urgent?	Oui……1 Non……0
Q29. Ya t-il une salle de scanner indépendante ou appareil pour examen urgent?	Oui……1 Non……0
Q30. Ya t-il une salle indépendante pour examen obstétrique et gynécologique ou appareil pour les soins obstétrique ou gynécologique urgent?	Oui……1 Non……0
Q31. Ya t-il une salle indépendante pour examen d'ORL ou appareil pour examen d'oto-rhino-laryngologique urgent?	Oui……1 Non……0
Q32 Ya t-il une salle indépendante pour examen d'ophtalmologique ou appareil pour examen des cas urgent?	Oui……1 Non……0

J'aimerai maintenant pour poser des questions à propos du matériel du département des urgences disponible.

Q33. Le matériel essentiel des urgences est-il disponible?	Oui……1 Non……0

Q34. Les suivants sont la liste du matériel essentiel des urgences. Est-ce ces différents matériaux disponibles?

		Oui(1)	Non(0)	Inconnu (99)
	Dépense en immobilisation			
A	Appareil d'ECG			
	Appareil de surveillance des patients			
B	Tension artérielle			
C	ECG			
D	Saturation en oxygène (oxymétrie pulsée)			

		Oui(1)	Non(0)	Inconnu (99)
E	ventilateur			
F	Soupape du ballon respiratoire et masque (adulte)			
G	Soupape du ballon respiratoire et masque (pédiatrique)			
H	Source d'oxygène (bouteille d'oxygène ou concentrateur) avec masque et tube			
I	stéthoscope			
J	Pompe aspirante (manuelle ou électrique)			
K	Thermomètre			
L	Scalpel avec lames			
M	Ecarteur			
N	Ciseaux			
O	Canule oropharyngée (taille adulte)			
P	Canule oropharyngée (taille pédiatrique)			
Q	Pinces hémostatique			
R	Gants de soins			
S	Gants stérile			
T	Porte aiguille			
U	Stérilisateur			
V	Spéculum vaginaux			
W	Inventaire du matériel et fourniture			
X	Pratiques exemplaires pour soins urgent			
	Utilisation des équipements supplémentaires pour personnel qualifiés			
Y	Pince de Magill (adulte)			
Z	Pince de Magill (pédiatrique)			
AA	Sonde trachéal (adulte)			
AB	Sonde trachéal (pédiatrique)			
AC	Sacs pour perfusion intraveineuse			
AD	Equipements d'insertion d'un drain thoracique			
AE	Manche de laryngoscope			
AF	Laryngoscope lame macintosh (adulte) avec bulbes et batteries			
AG	Laryngoscope lame macintosh (pédiatrique) avec bulbes et batteries			
AH	Kit de cricothyrotomie			
	Matériaux renouvelables			
AI	Tubes nasogastrique			
AJ	Source de lumière (lampe&lampe torche)			
AK	Solutés intraveineuse			
AL	Cathelons / épicrâniens			
AM	Seringues avec aiguilles (jetable)			
AN	Boite d'élimination d'objets pointus			

		Oui(1)	Non(0)	Inconnu (99)
AO	Garrots			
AP	Aiguilles et sutures			
AQ	Attelles pour avant-bras, jambe			
AR	Sondes urinaire (élimination)			
AS	Conteneur d'élimination des déchets			
AT	Masques			
AU	Protection oculaire			
AV	Blouses de protection/tabliers			
AW	Savon			
	Moniteur cardiaque et défibrillateur			
AX	Surveillance de l'ECG 3 dérivations			
AY	Surveillance de l'ECG 10 dérivations			
AZ	Moniteur de mesure de la pression artérielle non invasive			
BA	Moniteur de S_aO_2(saturation artérielle de l'oxygène)			
BB	Moniteur du CO_2 expiré			
BC	Défibrillateur manuel			
BD	Défibrillateur automatique			
BE	Défibrillateur stimulation externe			

J'aimerai vous poser des questions à propos des équipements de maintenance dans votre service d'urgence.

Q35. Ya t-il accès a l'atelier dépannage si les équipements tombent en panne?	Oui ……1 Si oui : Certains/Tout Non ……0
Q36. Ya t-il accès à la réparation des équipements s'ils tombent en panes?	Oui ……1 Si oui : Certains/Tout Non ……0
Q37. Ya t-il accès à la réparation des équipements dans l'aceinte de la structure hospitalière?	Oui ……1 Si oui : Certains/Tout Non ……0
Q38a. Ya t-il accès au dépannage des appareils à l'extérieur de la structure hospitalière ?	Oui ……1 Si oui : Certains/Tout Non ……0 → **Q39**

Q38b. S'il ya accès à un atelier de dépannage à l'extérieur de la structure, il est approximativement à quel distance?	1 – 25km ……1 27 – 50km ……2 51 – 200km ……3 200km+ ……4
Q39. Ya t-il un arrangement pour la maintenance des équipements avec le fournisseur?	Oui ……1 Si oui : Certains/Tout Non ……0
Q40. Le personnel des urgences est-il formé par rapport à l'utilisation des équipements?	Oui ……1 Si oui : certains/tout Non ……0
Q41. Ya t-il disponibilité sur l'information des fournitures, réparation, et les pièces des équipements?	Oui ……1 Si oui : certains/tout Non ……0
Q42. Ya t-il des protocoles pour la gestion des procédures d'urgence essentielle?	Oui ……1 Si oui : certains/tout Non ……0
Q43. Ya t-il des protocoles pour l'utilisation correct des équipements pour des procédures d'urgences essentielles?	Oui ……1 Si oui : certains/tout Non ……0
Q44. A quelle fréquence se fait l'inspection des équipements de salle par salle et les fournitures nécessaire pour les procédures d'urgences essentielles sont en bonne état?	Quotidien ……1 Hebdomadaire ……2 Mensuel ……3 Tout les six mois……4 Annuel ……5 Une fois_____ ans……6 Jamais ……7
Q45. Existe-il des outils d'informations, de l'éducation, et de la formation sur les équipements et procédures d'urgences à la disposition du personnel soignant?	Oui ……1 Non ……0

J'aimerai pour poser des questions à propos des protocoles de soins dans votre hôpital.

Q46. Avez-vous des voies critiques ou protocoles documentés pour l'infarctus du myocarde?	Oui ……1 Non ……0 Ne sais pas ……99
Q47. Avez-vous des voies critiques ou protocoles documentés pour l'AVC aigu?	Oui ……1 Non ……0 Ne sais pas ……99
Q48. Avez-vous des voies critiques ou protocoles documentés pour les traumatismes sévères ou multiples traumatismes?	Oui ……1 Non ……0 Ne sais pas ……99
Q49. Avez-vous des voies critiques ou protocoles documentés pour les maladies infectieux?	Oui ……1 Non ……0 Ne sais pas ……99
Q50. Avez-vous des voies critiques ou protocoles documentés pour multiples incident impliquant les blessés?	Oui ……1 Non ……0 Ne sais pas ……99
Q51. Avez-vous des voies critiques ou protocoles documentés pour le surpeuplement de la salle d'urgence?	Oui ……1 Non ……0 Ne sais pas ……99
Q52. Avez-vous des voies critiques ou protocoles documentés pour le triage des malades?	Oui ……1 Non ……0 Ne sais pas ……99

J'aimerai maintenant pour poser des questions à propos des soins d'urgences pre-hospitalier/ressources EMS. Premièrement j'aimerai commencer par vous poser des questions sur les types et nombre de personnel qui font parti des soins d'urgences pre-hospitalier.

Q53. Veillez indiquer le nombre du personnel au niveau pre-hospitalier dans les catégories suivants. Combien avez-vous dans votre hôpital? Combien de ceux-ci sont stationnés 24h/24?

		Temps plein (35hr/sem. +)	**Number of Part-Time (<35hr/wk)**	**Nombre de personnelles 24h/24**
a	Premier intervenant			
b	Chauffeur d'ambulance			
c	Aide en soins des ambulances			
d	Technicien en soins médicaux d'urgence			
e	Répartiteur médical d'urgence			
f	Auxiliaire paramédical			
g	Auxiliaire en soins intensifs			
h	Praticien auxiliaire/praticien des soins d'urgence			
i	Infirmiers diplômés d'Etat			
j	médecin			

Q54. Votre hôpital ou vos patients utilisent-ils SAMU?	Oui ……1 Non ……0 Ne sais pas ……99
Q55a. Votre hôpital a-t-il des ambulances?	Oui ……1 Non ……0 → **Passer à Q56** Ne sais pas ……99
Q55b. Si oui, combien d'ambulances possède votre hôpital?	<*write*> _____
Q56a. Votre hôpital reçoit-il des appels d'urgences?	Oui ……1 Non ……0 → **Passer à Q57** Ne sais pas ……99

Q56b. Si oui, combien d'appel recevez-vous par an?	<écrire> _____
Q57. Votre hôpital répartit-il des ambulances pour chercher des malades en situation d'urgence?	Oui ……1 Non ……0 Ne sais pas ……99

Q58. Is each ambulance equipped with the following supplies?

		Oui (1)	Non(0)	Inconnu(99)
	Equipements et fournitures d'EMS			
	Communications			
AA	Communication sans fils (ex. Radio, téléphone portable)			
	Protection			
AB	Gants de soins à usage unique en taille moyen-large			
AC	Protection oculaire (lunettes en verre ou plastique avec protection latérales)			
AD	Vêtement réfléchissant la lumière (ex. Gilet) pour identification et protection			
AE	Drapeau ou autre dispositif de control de circulation			
AF	Torche et piles de rechange et ampoule ou réflecteur ou bougies			
AG	Savon ou mousse antibactérienne pour le lavage de mains			
AH	Solution de nettoyage			
AI	Serviettes			
AJ	Vêtements protecteurs, blouses ou tabliers			
AK	Solution désinfectant pour matériel			
AL	Sacs plastics pour déchets non dangereux			
AM	Allumettes imperméables			
AN	Sacs d'incinération pour déchets biologiques			
AO	L'extincteur			
AP	Récipients à objet tranchants			
	Dégagement			
	Equipement fondamental pour dégagement			
AQ	Machettes			
AR	Leviers			
AS	Crics de véhicule			
	Autres équipements de dégagement			
AT	Cisailles			
AU	Scie			

		Oui (1)	Non(0)	Inconnu(99)
AV	Corde			
AW	Pelle			
AX	Vêtements protecteur			
AY	Courte planche pour dégagement			
	Equipement de dégagement specialize			
AZ	Lames			
BA	Epandeurs			
BB	Vérins			
	Immobilisation et transfert des malades			
BC	Morceau de bois long et rigide, planche en métal ou plastic			
BD	Planche pour attelles des membres			
BE	Civière (bois, plastic, dispositif en tissu)			
BF	Dispositif d'immobilisation de la tête			
BG	Minerve			
	Gestion de la respiration et voies respiratoires			
BH	Masque de protection facial			
BI	Masque de poche (ex. Pour la respiration bouche à masque)			
BJ	Ballon-masque			
	Nasopharyngée et / ou oropharyngée pour			
BK	Nourrissons			
BL	Enfants			
BM	Adultes			
BN	Canule nasale et tubes associés			
BO	Abaisse-langue			
BP	Equipement fixe d'oxygène et d'administration d'oxygène			
BQ	Masque faciale sans ré inspiration			
BR	Dispositif d'aspiration (manuel ou alimenté)			
BS	Yankauer ou pointe rigide d'aspirations			
BT	Dispositif d'insertion à l'aveugle			
BU	Manche de laryngoscope et lames			
BV	Sonde trachéal et connecteur			
BW	Mandrain/bougie			
BX	Pinces à échardes			
BY	Dispositif de détection d'oropharyngé			
BZ	Pince de Magill			
CA	Aiguille et seringues			
CB	Aiguille de thoracotomie			
	Moniteur cardiaque et défibrillateur			
CC	Surveillance ECG 3 dérivations			
CD	Surveillance ECG 10 dérivations			

		Oui (1)	Non(0)	Inconnu(99)
CE	Moniteur de mesure de la pression artérielle non invasive			
CF	Moniteur de CO2 expiré			
CG	Défibrillateur manuel			
CH	Défibrillateur automatique			
CI	Défibrillateur stimulation externe			
CJ	Contrôle d'hémorragies et lésion cutanée			
	Eau potable			
CK	Bandages			
CL	Bandages élastiques			
CM	Rouleaux de compresse			
CN	Compresses			
CO	Coton hydrophile			
CP	Bande adhésive			
CQ	SRO (solution de réhydratation orale)			
CR	Couvertures			
CS	Bande adhésive de pansement (sparadrap)			
CT	Bandes 4×4, bandes triangulaires			
CU	Garrot artériel			
CV	Aiguilles et seringues			
CW	Compresses stérile			
CX	Kit de perfusion intraveineuse (voies intraveineuse et cathelons)			
CY	Aiguille pour injection intra-osseuses ou équivalences			
CZ	Brûlures			
	Tulle gras ou paraffiné			
DA	Pansements stérile			
DB	Pansements pour brulures			
DC	Moniteur cardiaque et défibrillateur			
	Diagnostiques et surveillance			
DD	Pendule ou trotteuse			
DE	Stéthoscope			
DF	Appareil de mesure de la pression artérielle			
DG	Lampe-stylo			
DH	Torche (lampe-éclair)			
DI	Thermomètre			
DJ	Sphygmo-oxymètre			
DK	Dispositif de moniteur cardiaque électronique			
	Médecine			
DL	Oxygène			
DM	Pansements d'antibiothérapie locale			
DN	Diazépam (ou équivalence)			

		Oui (1)	Non(0)	Inconnu(99)
DO	Substances réglementées verrouillées			
DP	Sulfate de Morphine			
DQ	Acide Acétylsalicylique			
DR	Ibuprofène (ou équivalence)			
DS	Paracétamol (acétaminophène)			
DT	Dextrose 50%			
DU	Cristalloïdes (sérum salé)			
DV	Eau distillée sans pyrogène			
	Variétés			
DW	Liste des contacts d'urgence locale			
DX	Couteaux, ciseaux			
DY	Thermos pour l'eau à boire ou bouteille d'eau			
DZ	Contenants de fournitures et équipements (ex.sac à bandoulière, sac à dos ou boite)			
EA	Couverture d'urgence(en argent/argent ou argent/or)			
EB	Pelle			
EC	sacs de triage			
ED	Gel lubrifiante			
	Matériel d'écriture			
EE	Crayon			
EF	Marqueur permanent			
EG	Bloc-notes			
EH	Fiche pour documenter les soins des patients et incident			

FICHE D'INFORMATION

BUT

Cette recherche est menée dans le but de connaitre les ressources disponibles, besoins, personnel, médecins d'urgence et l'utilisation de la salle d'urgence de votre hôpital.je tiens également à connaitre les points de vue des malades et des prestataires de soins de santé sur les zones d'ombres et les secteurs clés de l'amélioration potentiels du système des services médicaux d'urgence (EMS) actuel, pour afin permettre de faciliter l'ouverture et le développement du nouveau centre D'urgence.

Cette recherche demandera votre participation.de ce fait, un entretien d'environ une heure sera mené. Nous vous implorons de prendre part à cette recherche car nous pensons que votre expérience en tant que [directeurs, médecins, infirmiers, pharmaciens, et administrateurs] des services de soins peut contribuer à une bonne compréhension et connaissance du système EMS actuel.

Votre participation à cette recherche est entièrement volontaire. Vous êtes libre de participer ou pas. Le choix que vous ferez n'aura aucune incidence sur votre travail ou sur des évaluations ou rapports de travail. Cependant, vous recevrez 3000 FCFA pour votre participation (le cas échéant).

Les informations obtenues ne seront divulgués à quiconque .Elles seront maintenu confidentielle.ces informations seront protégés sur ordinateur avec un mot de passe et seul l'équipe de chercheurs impliqués dans cette étude et le Centre JW de la Médecine Globale auront accès à ces informations.

Personne à contacter

Si vous avez des questions, vous. Pouvez les poser maintenant ou contacter les personnes suivantes:

Yunmi Chung

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Phone: 96.46.94.78

Joongsik Jeong

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Appendix B.1. Patient Demographic and Satisfaction Survey and Information Sheet (English)

Seoul National University College of Medicine
JW LEE Center for Global Medicine

Emergency Medical Service Patient Demographic Survey

Date:

Hello, my name is _____. I am a researcher working for KOICA (Korea International Cooperation Agency) and JW Lee Global Center for Medicine of Seoul National University College of Medicine with the permission of Cameroon's Ministry of Public Health.

We would like to invite you to participate in a short survey to help us better understand patient demographics of Cameroon's Emergency Medical Services (EMS) system. This is part of the Cameroon EMS system development project, which has been supported by Cameroon's Ministry of Public Health and KOICA. Information collected today will help develop a modern EMS system in Yaoundé that better suits patients' needs.

The survey will take about ten to fifteen minutes. This survey is confidential and no personal identifying information will be collected. Your participation will help improve the development of the Yaoundé Medico-Surgical Emergency Center and ultimately the overall quality of emergency medical service.

You will receive 1,000 XAF in compensation for your full participation. Upon completion of the interview I will need your signature to confirm that you have received compensation.

Q1. Do you agree to participate?	YES……1 NO……0 *<If patient answers NO, read the following and give the person the information sheet>* "Thank you so much for your time. Here is some additional information on our survey. Have a great day."

Participant (Interviewee's) Initial: _____
First I would like to ask you about yourself.

Q2. What is your gender?	Female ..... 1 Male..... 2 Other (*specify*):_____ ……96 Refused……98 Don't Know……99
Q3. How old are you?	<*write*> _____ Refused……98 Don't Know……99
Q4. What is your ethnicity?	Cameroon Highlander..... 1 Equatorial Bantu ..... 2 Kirdi……3 Fulani……4 Northwestern Bantu……5 Eastern Nigiritic……6 Other (*specify*):_____ ……96 Refused……98 Don't Know……99
Q5. What is your primary language spoken at home?	French..... 1 English ..... 2 Other (*specify*):_____ ……96 Refused……98 Don't Know……99
Q6. Which health district do you currently reside in?	District 1 ....1 District 2 ..... 2 District 3……3 District 4……4 District 5……5 District 6……6 District 7……7 Refused……98 Don't Know……99

Q7. What is your religion?	Christian..... 1 Muslim ..... 2 Other (*specify*):_____ ……96 Refused……98 Don't Know……99
Q8. What is your marital status?	Single, never married..... 1 Married or domestic partnership ..... 2 Widowed……3 Divorced……4 Separated……5 Other (*specify*):_____ ……96 Refused……98 Don't Know……99
Q9. What is your current employment status?	Employed for wages ..... 1 Self-employed..... 2 Out of work and looking for work ..... 3 Out of work but not currently looking for work..... 4 A homemaker ..... 5 A student..... 6 Military ..... 7 Retired ..... 8 Unable to work..... 9 Other (*specify*):_____ ……96 Refused……98 Don't Know……99
Q10. What is your weekly household income?	< 5,000 XAF..... 1 5,000 – 9,999 XAF..... 2 10,000 - 14,999 XAF……3 15,000 – 19,999 XAF……4 20,000 – 39,999 XAF……5 40,000 – 59,999 XAF……6 60,000 – 79,999 XAF……7 80,000 – 99,999 XAF……8 100,000 +……9 Refused……98 Don't Know……99

Q11. What is your education level? **(Prompt: what is the highest level of education that you have completed?)**	Elementary school (1-6 years)……1 Middle school (7-9 years) ……2 High school (10-12 years)……3 College or Associate's Degree……4 Post college or Graduate Degree……5 Other (*specify*):_____ ……96 Refused……98 Don't Know……99

Thank you. Now I would like to ask you about your visit to the hospital.

Q12. How did you get to the hospital? **(What was the main mode of transportation?)**	Walked……1 Taxi……2 Car (own/other individual/company)……3 Motorcycle (own/other individual/company)……4 Bus……5 Camrail (rail service)……6 Other (*specify*):_____ ……96 Refused……98 Don't Know……99
Q13. How long did it take you to get to the hospital?	__ __ . __ hours Refused……98 Don't Know……99
Q14. Why did you visit the emergency room?	_____
Q15. When did the injury/emergency/symptoms first occur?	< 1day ago……1 1 – 3 days ago……2 4 – 7 days ago……3 8 – 14 days ago……4 14 + days ago……5 Refused……98 Don't Know……99

Q16. How did/will you pay for today's visit?	Cash……1 Credit Card……2 Insurance……3 Other (*specify*):_____ ……96 Refused……98 Don't Know……99
Q17a. Overall, how satisfied were you with the emergency medical service you received? Would you say you were… <*read the options*>	Satisfied……1 → Skip to Q18 Somewhat Satisfied……2 → Skip to Q18 Neutral……3 Somewhat Unsatisfied……4 Unsatisfied……5
Q17b. What were some of the issues you had during your visit? Please select all that applies.	Misdiagnosis, missed or delayed diagnosis ……1 Inappropriate and/or inadequate treatment ……2 Inappropriate and/or inadequate examination and/or investigation ……3 Rudeness or insensitive/inappropriate remarks……4 Poor or inadequate communication, including inadequate update on medical condition ……5 Conduct and attitude ……6 Waiting time ……7 Billing/Cost issues……8 Admission related issues ……9 Patient flow issues ……10 Lack of interim care while awaiting doctor's review or admission ……11 Other (specify) _____ Refused……98 Don't Know……99
Q18. How would you rate the improvement in your medical condition due to the Emergency Department visit?	Resolved ……1 Somewhat Resolved ……2 Neutral ……3 Somewhat Unresolved……4 Unresolved ……5
Q19. If another medical emergency occurs, would you visit this emergency room again?	Yes ……1 No……0 Refused……98 Don't Know……99

Q20. Would you recommend this emergency room to your family and friends?	Definitely yes ..... 1 Probably yes..... 2 Probably no ..... 3 Definitely no..... 4 Refused……98 Don't Know……99

Thank you very much!
Do you have any questions about this survey?
Do you have any additional comments that you believe would be helpful to us?

Thank you for taking the time to complete this survey. Here we are giving you an information sheet about this survey that also has our telephone and contact email in case you later have any questions.

<Interviewer, please hand information sheet to participant>

Seoul National University College of Medicine
JW LEE Center for Global Medicine

INFORMATION SHEET
(Survey)

PURPOSE

Thank you for participating in this interview. This interview will help us better understand the demographics of patients utilizing Cameroon's Emergency Medical Services (EMS) system. This interview is being done by a researcher from Emory University – Rollins School of Public Health, in Atlanta GA, and her research assistants as part of the Cameroon EMS system development project. This project has been supported by KOICA (Korea International Cooperation Agency) and Cameroon's Ministry of Public Health. This interview will only take 10 minutes. You will receive a compensation of 1,000 XAF for your participation.

CONFIDENTIALITY

This interview is confidential and no personally identifiable information will be collected. We will not be collecting your name. You can choose to participate or not participate.

CONTACT INFORMATION

If you have any questions or concerns, please contact us via phone or email as indicated below:

Yunmi Chung

Email: yunmi.chung@emory.edu
Phone: 96.46.94.78

Joongsik Jeong

Email: joongsjeong@gmail.com
Phone: 95.26.16.07

Appendix B.2. Patient Demographic and Satisfaction Survey and Information Sheet (French)

Enquête sur la Démographie des Patient du service d'Urgence Médical

Date:

Bonjour, je m'appelle _____. Je suis enquêtrice, je travaille pour l'agence de coopération internationale de la Corée appelé KOICA (Korea International Cooperation Agency) et le centre JW Lee pour la médecine globale de l'Université national de médecine de Seoul et ayant obtenu l'autorisation du Ministère de la Santé Publique du Cameroun.

Nous aimerions vous inviter à participer à notre enquête. Cette enquête permettra de mieux comprendre les données démographiques des patients des services des urgences médicales du Cameroun (EMS). Cette étude fait parti du projet de développement du système EMS, et à été encouragé par le Ministère de la Santé publique et KOICA.

Les informations obtenues permettront de développer un système EMS moderne à Yaoundé qui va mieux répondre aux besoins des patients.

Cette enquête prendra sept à dix minutes. Les informations obtenues durant cette enquête seront maintenu confidentielles, cependant aucune information personnelle pouvant permettre de vous identifier ne seront obtenues. Votre participation aidera à l'amélioration du développement du centre des urgences médico-chirurgical de Yaoundé ainsi qu'a la qualité des soins du service des urgences médical.

Vous recevrez ce pendant une somme de 1,000 FCFA comme récompense pour avoir participé. Votre signature sera nécessaire à la fin de l'interview ce qui signifie que vous avez perçu votre compensation.

Q1. Acceptez-vous participer ?	OUI……1 NON……0 *<Si non, veuillez lire la proposition suivante et remettez la fiche d'information au participant>* "Nous vous remercions de votre collaboration. Voici les informations supplémentaires de notre enquête. Passer une excellente journée."

Participant (Interviewee's) Initial: _____

J'aimerai d'abord vous poser des questions à propos de vous- memes.

Q2. Quel est votre sexe?	Féminin……1 Masculin……2 Autres (préciser):_____ ……96 Refus ……98 Ne sais pas……99
Q3. Quel est votre âge?	< veuillez écrire> _____ Refus ……98 Ne sais pas……99
Q4. Quel est votre groupe ethnique?	Peuple des hauts plateaux……1 Bantou du sud……2 Kirdi……3 peuls……4 Bantou du Nord-ouest……5 Peuple de l'est ……6 < veuillez écrire> _____ Refus ……98 Ne sais pas……99
Q5. Quel est votre première langue parlé à domicile?	Français……1 Anglais……2 Autres (préciser):_____ ……96 Refus ……98 Ne sais pas……99
Q6. Dans quel district de santé résidez-vous actuellement?	District 1 ……1 District 2 ……2 District 3……3 District 4……4 District 5……5 District 6……6 District 7……7 Refus ……98 Ne sais pas……99

Q7. Quelle est votre religion?	Chrétienne .....1 Musulmane .....2 Autres (préciser):_____ ……96 Refus ……98 Ne sais pas……99
Q8. Quel est votre statut matrimonial?	Célibataire,……1 Marié ou vie en concubinage……2 Veuf (ve) ……3 Divorcé ……4 Séparé……5 Autres (préciser):_____ ……96 Refus ……98 Ne sais pas……99
Q9. Quel est votre statut de travail?	Emploie contre une rémunération……1 Auto-emploie……2 Licencié mais à la recherche d'un nouveau emploie……3 Licencié mais pas à la recherche d'un nouveau emploie……4 Personne au foyer ……5 Etudiant ……6 Militaire ……7 Retraité ……8 Incapable de travailler……9 Autres (préciser):_____ ……96 Refus ……98 Ne sais pas……99
Q10. Quel est votre dépense hebdomadaire?	< 5,000 FCFA.....1 5,000 – 9,999 FCFA.....2 10,000 - 14,999 FCFA ……3 15,000 – 19,999 FCFA……4 20,000 – 39,999 FCFA ……5 40,000 – 59,999 FCFA ……6 60,000 – 79,999 FCFA ……7 80,000 – 99,999 FCFA ……8 100,000 +……9 Refus ……98 Ne sais pas……99

Q11. Quel est votre niveau d'étude? **(Bref : Quel est votre niveau d'étude le plus élevé)**	Niveau primaire (1-6 ans)……1 Niveau secondaire (6ème-3ème :7-10 ans)…… 2 Niveau secondaire (3ème –Tle :11-13ans)……3 Ecole ou diplôme professionnel……4 Licence universitaire……5 Autres (préciser):_____ ……96 Refus ……98 Ne sais pas……99

Merci, nous aimerions ce pendant vous poser des questions à propos votre de votre visite à l'hôpital.

Q12. Comment êtes-vous arrivés à l'hôpital ? **(Quel étais votre moyen de transport ?)**	A pied ……1 Taxi ……2 Voiture (personnel/ Autre personne/société)……3 Mototaxi (personnel/ Autre personne/société……4 Bus……5 Camrail (train)……6 Autres (préciser):_____ ……96 Refus ……98 Ne sais pas……99
Q13. Combien de temps aviez-vous prie pour arriver à l'hôpital ?	__ __ . __ heure Refus ……98 Ne sais pas……99
Q14. Pourquoi visitez-vous la salle des urgences?	_____
Q15. De quelle période date l'apparition de vos premiers blessures/ symptômes ?	< 1 jour……1 1 – 3 jours……2 4 – 7 jours……3 8 – 14 jours……4 14 jours et plus……5 Refus ……98 Ne sais pas……99

Q16. Comment allez-vous payer vos services d'aujourd'hui ?	Espèce ……1 Carte de crédit ……2 Assurance ……3 Autres (préciser):_____ ……96 Refus ……98 Ne sais pas……99
Q17a. Dans l'ensemble avez-vous étés satisfait des services reçus ? si vous l'aviez été…*<choisir une option>*	Satisfait……1 → **passer à Q18** Quelque peu satisfait ……2 → **passer à Q18** Neutre ……3 Quelque peu insatisfait ……4 Insatisfait ……5
Q17b. Quel sont les problèmes que vous avez rencontré durant votre passage? Veuillez choisir les options appliquées.	Mauvais diagnostic, absence ou retard de diagnostic ……1 Inapproprié et/ou traitement inadequate ……2 Inapproprié et/ou examen inadéquat et /ou bilan ……3 Grossier ou insensible/remarques inappropriés ……4 Faible ou communication inadéquate, ainsi qu'une information inadéquate sur l'évolution de la maladie ……5 Conduite et attitude……6 Temps d'attente……7 Facturation / coût ……8 Problèmes d'admission……9 Problème de flux des maladies……10 Absence de premiers soins ou d'admission à l'attente du médecin soignant……11 Autres (préciser):_____ ……96 Refus ……98 Ne sais pas……99
Q18. Comment pouvez-évaluer l'amélioration de votre état de santé après votre visite au service des urgences?	Résolue ……1 Quelque pue résolue ……2 Neutre ……3 Quelque peu non résolue ……4 Non résolue ……5
Q19. Si une autre urgence médical se produit visiterez – vous encore ce service d'urgence?	Oui……1 Non……0 Refus ……98 Ne sais pas……99

Q20. Recommanderez-vous ce service d'urgence à votre famille ou amis?	Certainement.....1 Probablement.....2 Probablement pas.....3 Certainement pas.....4 Refus .....98 Ne sais pas.....99

Nous vous remercions de votre collaboration!
Avez-vous des questions par rapport à cette étude ?
Avez-vous d'autres soucis que vous pensez nécessaire et qui pourraient nous êtres utile?

Merci d'avoir pris du temps de compléter cette étude. Nous vous remettons ce pendant un formulaire de cette enquête dans lequel vous trouverez notre numéro de téléphone et adresse E-mail au cas où vous aurez des questions à nous poser concernant cette étude.

< Veuillez remettre la fiche d'enquête aux participants>

FICHE D'INFORMATION
(Enquête)

BUT

Cette recherche est menée dans le but de mieux appréhender la démographie des malades des services des urgences médicales (EMS). Le centre national d'urgence sera bientôt opérationnel et nous aimerions obtenir vos opinions (prestataires des soins) afin de faciliter l'ouverture et le développement du nouveau centre d'urgence.

Cette recherche demandera votre participation.de ce fait, un entretien d'environ quinze minutes sera mené. Nous vous implorons de prendre part à cette recherche car nous pensons que votre expérience en tant que prestataires des services de soins peut contribuer sur la bonne compréhension et la connaissance de la démographie des malades du système EMS et du service des urgences des hôpitaux de Yaoundé.

Votre participation à cette recherche est entièrement volontaire. Vous êtes libre de participer ou pas. Le choix que vous ferez n'aura aucune influence sur la nature des services que vous recevrez à l'hôpital. Cependant, vous recevrez 1,000 FCFA pour votre participation (le cas échéant).

Les informations obtenues ne seront divulgués à quiconque. Elles seront maintenu confidentielle. Ces informations seront protégés sur ordinateur avec un mot de passe et seuls l'équipe des chercheurs impliqués à cette étude et le Centre JW de la Médecine Globale auront accès à ces informations.

Si vous avez des questions, vous. Pouvez les poser maintenant ou contacter les personnes suivantes:

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