# THE STATE OF EMERGENCY MEDICAL SERVICES

## IN SUB-SAHARAN AFRICA



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Global Road Safety Facility

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Establishment of Sierra Leone's National EMS (nEMS) System

# Acknowledgements

# Abbreviations

| | |
|---|---|
| A&E | Accident and Emergency Department |
| Africa CDC | Africa Centers for Disease Control |
| CFA | African Financial Community |
| AU | African Union |
| AED | Automated External Defibrillator |
| ALS | Advance Life Support |
| ALI | Automatic Location Identification |
| ANI | Automatic Number Identification |
| MBBS | Bachelor of Medicine, Bachelor of Surgery |
| BEC | Basic Emergency Care |
| BLS | Basic Life Support |
| BOCRA | Botswana Communications Regulatory Authority |
| BHPC | Botswana Health Professions Council |
| CLI | Calling Line Identity |
| MakCHS | College of Health Sciences of the Makerere University |
| CRA | Communications Regulatory Authority |
| CPD | Continuing Professional Development |
| CGPA | Cumulative Grade Point Average |
| CRA | Communications Regulatory Authority |
| PhD | Doctor of Philosophy |
| DNR | Do Not Resuscitate |
| DOD | Declaration of Death |
| DALYs | Disability-Adjusted Life Years |
| DCP | Disease Control Priorities |
| EAC | East African Community |
| ECOWAS | Economic Community of West African States |
| ECC | Emergency Control Center |
| ED | Emergency Department |
| EMC | Emergency Medical Care |
| EMCS | Emergency Medical Care Service |
| EMD | Emergency Medical Dispatch |
| EMS | Emergency Medical Services |
| EMT | Emergency Medical Technician |
| EMTA | Emergency Medical Training Academy |

| | |
|---|---|
| A&E | Accident and Emergency Department |
| ERA | Emergency Response Agency |
| ER | Emergency Room |
| EV | Emergency Vehicle |
| ETSI | European Telecommunications Standards Institute |
| FR | First Responder |
| FRC | First Responder Care |
| GNC | General Nursing Council |
| GP | General Practitioner |
| GEC | Global Emergency Care |
| GPA | Grade Point Average |
| GSM | Global System for Mobile telecommunications |
| HPA | Health Professions Authority |
| HNP | Health, Nutrition and Population Global Practice |
| HEC | Higher Education Council |
| HR | Human Resources |
| HRH | Human Resources for Health |
| ICT | Information Communication Technology |
| ITLS | International Trauma Life Support |
| ICU | Intensive Care Unit |
| IP | Internet Protocol |
| ISM | Industrial, Scientific and Medical |
| ITU | International Telecommunications Union |
| LBNM | Liberian Board for Nursing and Midwifery |
| LE | Licensing Examination |
| LMICs | Low- and Middle-Income Countries |
| MNSc | Master of Nursing Science |
| MMed | Master of Medicine |
| MSc | Master of Science |
| MoE | Ministry of Education |
| MoD | Ministry of Defense |
| MoH | Ministry of Health |
| MoIA | Ministry of Internal Affairs |
| MSC | Mobile Switching Centre |
| MVC | Motor Vehicle Crash |
| MNH | Muhimbili National Hospital |
| MUHAS | Muhimbili University of Health and Allied Sciences |

| | |
|---|---|
| A&E | Accident and Emergency Department |
| NCHE | National Council for Higher Education |
| NNP | National Numbering Plan |
| NR | National Respondent |
| NRHM | National Rural Health Mission |
| NGO | Non-Government Organization |
| NHDP | National Healthcare Development Plan |
| NR | National Respondent |
| Obs/Gyn | Obstetrics and Gynecology |
| OHCA | Out-of-Hospital Cardiac Arrest |
| OHEC | Out-of-Hospital Emergency Care |
| ORSEC | Organization de Secours (Emergency Response) |
| PALS | Pediatric Advanced Life Support |
| PGD | Postgraduate Diploma |
| PECS | Pre-hospital and Emergency Care Services |
| PPDA | Public Procurement and Disposal Assets |
| PPP | Public-Private Partnership |
| PSAP | Public Safety Answering Point |
| RTAs | Road Traffic Accidents |
| SoN | School of Nursing |
| SADC | Southern African Development Community |
| SIM | Subscriber Identity Module |
| SMS | Short Message Service |
| SEMSV | Specialized Emergency Medical Services Vehicle |
| SOP | Standard Operating Procedures |
| SSA | Sub-Saharan Africa |
| TCRA | Tanzania Communications Regulatory Authority |
| UCSA | Universal Communications Service Access |
| TNMC | Tanzania Nursing and Midwifery Council |
| TZS | Tanzanian Shilling |
| UHF | Ultra-High Frequency |
| UMTS | Universal Mobile Telecommunications System |
| USIM | Universal Subscriber Identity Module |
| UB | University of Botswana |
| UIC | University of Illinois at Chicago |
| UNICV | University of Cabo Verde |
| US | United States of America |

| A&E | Accident and Emergency Department |
|-----|-----------------------------------|
| USD | United States Dollar |
| UHC | Universal Health Coverage |
| VHF | Very High Frequency |
| VoIP | Voice over Internet Protocol |
| WIFI | Trademarked term meaning IEEE 802.11x |
| WBG | World Bank Group |
| WHO | World Health Organization |
| YLD | Years Lived with Disability |
| YLL | Years of Life Lost |
| ZICTA | Zambia Information and Communications Technology Authority |

### COUNTRY ABBREVIATIONS

| BDI | Burundi |
|-----|---------|
| BFA | Burkina Faso |
| BWA | Botswana |
| CAF | Central African Republic |
| CMR | Cameroon |
| COG | Congo Brazzaville |
| COM | Comoros |
| CPV | Cabo Verde |
| GAB | Gabon |
| LBR | Liberia |
| LSO | Lesotho |
| MDG | Madagascar |
| MRT | Mauritania |
| MWI | Malawi |
| NER | Niger |
| RWA | Rwanda |
| SDN | Sudan |
| SEN | Senegal |
| SLE | Sierra Leone |
| TCD | Chad |
| TGO | Togo |
| TZA | Tanzania |
| UGA | Uganda |
| ZMB | Zambia |
| ZWE | Zimbabwe |

# Glossary

- **Automatic External Defibrillator (AED):** Portable electronic device that analyzes the heart's rhythm for life-threatening cardiac arrhythmias of ventricular fibrillation and pulseless ventricular tachycardia. It delivers defibrillation (application of electricity which stops the arrhythmia) allowing the heart to re-establish an effective rhythm. With simple audio and visual commands, it is designed to be simple to use for the layperson, and its use is taught in many cardio-pulmonary resuscitation (CPR) and first aid classes.

- **Advanced and Basic Life Support Equipment:** While equipment requirements vary depending on local regulations, basic life support (BLS) equipment typically includes (a) equipment for airway management and ventilation (suction, oxygen, bag-valve masks, airways, etc.), (b) AED, (c) immobilization devices for trauma (splints, cervical collars, head immobilization devices, backboards, etc.), (d) bandages of various types, (e) communications equipment (e.g., two-way radios), and, (f) obstetrical kits. Advanced life support (ALS) equipment includes (a) airway and ventilation equipment (typically including endotracheal tubes), (b) equipment for vascular access (intravenous (IV) solutions, catheters, etc.), (c) cardiac life support equipment and monitors, (d) nebulizer and glucose testing devices, and, (e) medications that should be utilized by paramedics or healthcare providers who have undergone more extensive training.

- **Advanced Life Support (ALS):** Life support and life-saving mechanisms and protocols that, contrariwise to Basic Life Support (BLS), includes administration of medicines, performing injections, and conducting invasive airway procedures prior to the arrival of the patient at a hospital. Advance Life Support are performed by doctors, nurses and the paramedic staff, while Basic Life Support protocols can be performed by personnel with a lower level of training.

- **Advanced Trauma Life Support (ATLS) Training:** Appropriate training for advanced EMTs, paramedics, trauma nurses, physicians and other advanced EMS personnel. Courses include patient assessment and management, basic and advanced airway management, needle chest decompression and fluid resuscitation, spinal motion restriction, extremity immobilization and traction splint application.

- **Automatic Location Identification (ALI):** Automatic display at the public-safety answering point (PSAP) of the caller's telephone number, the address/location of the telephone and, in some cases, supplementary emergency services information.

- **Automatic Number Identification (ANI):** Service that provides the receiver of a telephone call with the number of the calling phone. The method of providing this information is determined by the service provider. This allows users to screen their calls. ANI is also used by emergency call center dispatchers.

- **Basic Life Support (BLS):** Refers to a variety of noninvasive emergency procedures performed

to assist in the immediate care of a patient, including cardiopulmonary resuscitation, hemorrhage control, stabilization of fractures, spinal immobilization, and basic first aid. BLS is typically ivered by Emergency Medical Technician (EMT)-basic trained pre-hospital crews, trained first responders, or trained by-standers until more advanced and definitive medical care can be implemented. The scope of practice of these various groups of BLS personnel varies depending on local regulations and the amount of training received.

• **Basic Trauma Life Support (BLTS) Training:** Basic Trauma training course is designed to provide pre-hospital care providers with the skills necessary to provide a thorough assessment, initial resuscitation, and rapid transportation of the trauma victim.

• **Calling Line Identity (CLI):** Method by which inbound calls can be identified by their number of origin and, in some cases, the name of the person or organization that is associated with the number. The phone number of the person calling is displayed on the recipient's telephone screen, or on a separate device. Businesses make use of the inbound caller's data as part of a statistics gathering process, or in order to screen inbound calls and respond to them appropriately.

• **Carrier Selection/Pre-selection Code (CSC):** Carrier Selection is a facility that enables subscribers connected to one operator to choose to have some of their telephone calls carried by that operator or by another operator. When a subscriber uses Carrier Selection, the call is routed through the selected operator rather than the operator to which that subscriber is physically connected. Carrier Selection Codes are composed of 5 digits and are allocated to telecommunication services providers. With Carrier Pre-Selection, one or several default operators are programmed into the exchange of the operator providing network access to the subscriber according to the subscriber's choice.

• **Computer-Aided Dispatch (CAD):** Computer-Aided Dispatch is a method used by dispatchers to alert, track and coordinate emergency response personnel, vehicles and resources, both during and between response operations. CAD systems allow improvement in response times and communication between the public and EMS. CAD systems are comprised of several information and communication technologies hardware and software components, and can vary in complexity from basic two-way radio communications to complex software suites that communicate with mobile data terminals carried in multiple response fleets and tracked in real-time through GPS.

• **Cumulative Grade Point Average (CGPA):** Average grades obtained by a student during specific periods, like a term or a semester, while the overall GPA refers to their average grades throughout their entire academic experience. For medical school, science and non-science GPAs are sometimes calculated separately, with more weight or emphasis given to the science GPA.

• **Disability Adjusted Life Years (DALYs):** Equivalent to lost years of "healthy" life. The sum of these DALYs across the population, or the burden of disease, can be thought of as a measurement of the gap between current health status and an ideal health situation where the entire population lives to an advanced age, free of disease and disability. DALYs for a disease or health condition are calculated as the sum of the Years of Life Lost (YLL) due to premature mortality in the population and the Years Lost due to Disability (YLD) for people living with the health condition or its

consequences.

- **Do Not Resuscitate (DNR):** Legal order, written or oral depending on country, indicating that a person does not want to receive cardiopulmonary resuscitation if that person's heart stops beating. Sometimes it also prevents other medical interventions. The legal status and processes surrounding DNR orders vary from country to country but most commonly, the order is placed by a physician based on a combination of medical judgements and patient wishes.

- **Emergency Ambulance:** Vehicle used to provide care to patients with an acute illness or injury. They range from vans, boats, helicopters, or even converted vehicles to rotary and fixed-wing aircraft (known as air ambulances). The most common types of road ambulances are (i) patient transport ambulances (European Type A or North American Type I); (ii) emergency ambulance (BLS, European Type B or North American Type II); and (iii) mobile intensive care units (ALS, European Type C or North American Type III). Images immediately below show Type B ambulances (Toyota Land Cruiser) used in Sierra Leone, while the images below that show a typical Type C ambulance.

Photo credits: D. Haazen (implementation support mission Sierra Leone, study tour France)

- **Emergency Control Center (ECC):** Building or room where control room operators receive

incoming telephone calls from members of the public in need of assistance, that have been redirected by the Operator Assistance Center.

- **Emergency Medical Dispatch (EMD):** System that enhances services provided by public-safety answering point (PSAP) call takers by allowing them to quickly narrow down the caller's type of medical or trauma situation, so as to better dispatch emergency services, and provide quality instruction to the caller before help arrives.

- **Emergency Medical Services (EMS):** Formalized prehospital care, provided by emergency care professionals who respond to medical emergencies within a well-defined jurisdiction. EMS refers to an established entity, agency or system, which is appropriately integrated into the existing OHEC and facility-based healthcare system, thereby facilitating the coordinated, timely, and safe provision of emergency care and transportation to the most appropriate healthcare facility.

- **Emergency Medical Technicians (EMTs):** Clinicians trained to respond quickly to emergency situations regarding medical issues, traumatic injuries and accidents. They may be employed by private ambulance services, municipal EMS agencies, governments, hospitals, and fire departments to provide medical care under a defined set of protocols, which are typically written by physicians and performed under medical direction and control.  Different levels of EMTs may exist, depending on the level of training and the regulatory framework in a particular country, ranging from EMT-Basic (BLS), EMT-Intermediate (EMT-I, who have additional training in IV administration, additional medication administration and potentially advanced airway management, and EMT-Advanced (ALS).

- **E.164 Number:**  International telephone numbering plan that ensures each device has globally unique number. This number allows phone calls and text messages can be correctly routed to individual phones in different countries.

- **First Aid Training:** Training that mixes both practice and theory to teach attendees how to give immediate assistance to any person suffering from a minor or serious illness or injury, with care provided to preserve life, to prevent the condition from worsening or to promote recovery until medically trained individuals arrive on scene. Depending on the course, the trainees can be taught how to examine a casualty, use a defibrillator, familiarize themselves with basic life support such as learn how to control bleeding and trauma.

- **First Responder:** Person among those responsible for going immediately to the scene of an accident or emergency to provide assistance. In the case of medical emergency, their role is to provide basic first aid until the ambulance arrives, and in the case of trapped patients or unstable environment their mission is to secure the scene in terms of hazardous materials and work to extricate the patients. First responders include lay people from the community, police officers, fire fighters, EMT and others trained in first aid.

- **Global Road Safety Facility (GRSF):** Global multi-donor fund hosted by the World Bank with the mission to help governments develop road safety management capacity and scale up road

safety delivery in LMICs. To achieve that goal, GRSF provides funding, knowledge, and technical assistance to LMICs.

- **Health Management Information System (HMIS):** System whereby health data are recorded, stored, retrieved and processed to improve decision-making. Data delivered through HMIS come from service delivery reports and administrative records kept as part of routine transactions at health facilities and management offices. HMIS is one of the six core building blocks of the health system and provides data needed for other components (service delivery, health workforce, access to essential medicines, financing, and leadership).

- **Health, Nutrition and Population Global Practice (HNP):** World Bank Global Practice Group that supports countries' efforts to progress towards universal health coverage through stronger primary health systems and by providing quality, affordable health services to everyone, regardless of their ability to pay.

- **Health Professions Council (HPC):** Organization composed of several agencies that aims to coordinate regulatory efforts among the various health care licensing boards represented on the HPC.

- **Hospital's Catchment Area:** Area from which a hospital's patients are drawn.  The boundaries of a catchment area can be set in different ways, for example one method is to determine a minimum admission rate for a given geographic unit.

- **Human Capital Development (HCD):** Development of the knowledge, skills, and health that people accumulate throughout their lives, enabling them to realize their potential as productive members of society.

- **Industrial, Scientific and Medical (ISM) bands:** Portions of the radio spectrum reserved internationally for industrial, scientific and medical purposes other than telecommunications. The ISM bands are defined by the ITU Radio Regulations (article 5) in footnotes 5.138, 5.150, and 5.280 of the Radio Regulations. Individual countries' use of the bands designated in these sections may differ due to variations in national radio regulations.

- **Intensive Care Unit (ICU):** Special department of a hospital or health care facility that provides patients that have severe or life-threatening illnesses and injuries with intensive treatment medicine. Common conditions that are treated within ICUs include acute respiratory distress syndrome, septic shock and other life-threatening conditions. ICUs are distinguished from general hospital wards by a higher staff-to-patient ratio, access to advanced medical resources and highly trained physicians, nurses and respiratory therapists who specialize in caring for critically ill patients.

- **Intermediate Ambulance:** Ambulance providing inter-hospital and inter-facility transfer of patients in order to support the Acute Hospitals planning/bed management and discharge policies. The use of intermediate ambulances reduces the reliance on emergency ambulances to undertake these calls ensuring they are available to respond to emergency incidents when they arise.

- **International Telecommunication Union Recommendation E.161.1:** Guidelines to select Emergency Number for public telecommunications networks, stipulating that "A Member State that is planning to introduce an emergency number could use either 112 or 911, in adherence with applicable regulations concerning emergency numbers […]. A Member State that is planning to introduce a second alternative emergency number could use either 112 or 911, or both, which should be routed to the existing emergency number. A second alternative emergency number facilitates, for example, emergency calling by travelers visiting the country."

- **International Trauma Life Support (ITLS):** Nonprofit organization dedicated to the education in managing out-of-hospital trauma situations. The educational materials presented by this organization are taught to emergency medical services personnel across the United States and internationally.

- **Internet Protocol (IP):** Principal communications protocol in the Internet protocol suite for relaying datagrams across network boundaries. Its routing function enables internetworking, and essentially establishes the Internet.

- **Level 1 numbers:** Numbers beginning with the digit '1' reserved for special services which includes calls for operator assistance, service enquiry, machine-to-machine ("M2M"), Internet dial-up, voice information, IN services and access code IDD type of services. Their length generally ranges from four to five digits.

- **Licensing Examination (LE):** One of the last examinations that a candidate must face before being granted a license A board has the responsibility to ensure that the examination meets technical, professional, and legal standards and protects the health, safety and welfare of the public by assessing candidates' abilities to practice competently.

- **Low- and Middle-Income Countries (LMICs):** For the current 2021 fiscal year, low-income economies are defined as those with a GNI per capita, calculated using the World Bank Atlas method, of $1,035 or less in 2019. Lower middle-income economies are those with a GNI per capita between $1,036 and $4,045. Upper middle-income economies are those with a GNI per capita between $4,046 and $12,535.

- **Mobile Intensive Care Unit (Type C):** Ambulances primarily used for Advanced Life Support and rescue work. Consequently, it is equipped with all the necessary medical supplies for Advanced Life Support, while other ambulances only have equipment for Basic Life Support.

- **Mobile Switching Center (MSC):** Centerpiece of a network switching subsystem, mostly associated with communications switching functions such as call set-up, release, and routing. It also performs a host of other duties, including routing SMS messages, conference calls, fax, and service billing as well as interfacing with other networks, such as the public switched telephone network.

- **National Numbering Plan (NNP):** Type of numbering scheme used in telecommunication to assign telephone numbers to subscriber telephones or other telephony endpoints. Telephone numbering

plans are defined in each of administrative regions of the public switched telephone network and they are also present in private telephone networks.

- **National Respondents:** Staff members with a good knowledge of EMS in the Ministry of Health and/or another public central authority (i.e. Ministry of Transport, National Agency of Telecommunications Regulations, Ministry of Education, etc.).

- **Out-of-Hospital Emergency Care (OHEC):** Full spectrum of emergency care that occurs outside healthcare facilities. This broadly includes care delivered by both laypersons and professional responders.

- **Patient Association:** Not-for profit organizations which are patient focused, and whereby patients and/or carers (the latter when patients are unable to represent themselves) represent a majority of members in governing bodies. Some are coalitions or organizations working across diseases, channeling the voice of the whole patient community on cross-cutting issues, while some are condition-specific, meaning that they deal with a single disease (Alzheimer's, diabetes, etc.) or disease-area (rare diseases, mental health conditions, etc.).

- **Pre-hospital Care:** Out-of-hospital emergency care delivered by a professional provider with the ability to provide transport to a healthcare facility. This includes all the key elements of OHEC, namely bystander-initiated care, easy access to emergency care services, provision of medical care by trained prehospital practitioners, and emergency transportation to the closest, most suitable formal healthcare facility.

- **Public Network Access Point:** Public network exchange facility where Internet service providers (ISPs) connect with one another in peering arrangements.

- **Public Safety Answering Point (PSAP):** Call center where emergency calls (like police, fire brigade, and ambulance) initiated by any mobile or landline subscriber are terminated.

- **Rapid Response Vehicle:** Refers to an ambulance, a fast response car or a police car. All of these have special equipment for emergencies.

- **Residency Program:** Specialized practical training in a hospital or clinic under the supervision of a senior medical clinician, for a physician who had finished medical school. Board certification in all medical and surgical specialties requires the satisfactory completion of a residency program and successful completion of a specialty board examination.
- Short Message Service (SMS): Text messaging service component of most telephone, Internet, and mobile device systems using standardized communication protocols.

- **SIM and USIM (Universal Subscriber Identity Module):** Entities that store subscriber-related information and implement the security functions pertaining to authentication and ciphering on the user side in UMTS and LTE (3G and 4G) devices. The USIM is the functional equivalent of the SIM in a GSM device.

- **Simple Triage and Rapid Treatment (START):** Triage approach developed in the United States for Mass-Casualty incidents (MCIs) which classifies patients into four different classes. Minor patients are those who are capable of walking away from the scene; delayed patients are those for whom treatment may be delayed by some time without risking their lives; immediate patients are those who will deteriorate most rapidly without care; and expectant patients are those who are expected to die no matter what care is given. After the patients are classified, START gives the highest priority to patients in the immediate class, then to those in the delayed class. Once the system is cleared of patients in these time-critical classes, resources may be used for those in the minor and expectant classes.

- **Standard operating procedures (SOPs):** Documented processes that a company has in place to ensure services and/or products are delivered consistently every time.

- **Sub-Saharan Africa (SSA):** Countries that lie south of the Sahara. In this report, SSA countries are those that responded to the EMS questionnaire. They are the following: Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo Brazzaville, Gabon, Lesotho, Liberia, Madagascar, Malawi, Mauritania, Niger, Rwanda, Senegal, Sierra Leone, Sudan, Tanzania, Togo, Uganda, Zambia and Zimbabwe.

- **Transport Ambulance (Type A):** Vehicle that transports patients to, from or between places of medical treatment, such as hospital or dialysis center, for non-urgent care. These can be vans, buses, or other vehicles.

- **Universal Health Coverage (UHC):** One of the targets the nations of the world set when adopting the Sustainable Development Goals in 2015. UHC means that all individuals and communities receive the health services they need without suffering financial hardship. It includes the full spectrum of essential, quality health services, from health promotion to prevention, treatment, rehabilitation, and palliative care.

- **Voice Communication Terminal Equipment:** Consists of smartphones, tablets, soft phones, and IP phones.

- **Voice over Internet Protocol (VoIP):** Its core function is long-distance voice services. Regular innovations and development in the VoIP have led to the implementation of new applications in VoIP. Voice over IP technology allows effective connection between multiple communication systems including VHF and UHF radios, intercoms, and radios.

- **Years Lived with Disability (YLD):** Number of incident cases during a particular time period, multiplied by the average duration of a particular disease and a weight factor that reflects the severity of the disease on a scale from 0 (perfect health) to 1 (dead).

- **Years of Life Lost (YLL):** Number of deaths multiplied by the standard life expectancy at the age at which death occurs for a given cause, age and sex.

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# Executive Summary

## Background and Introduction

Health system investments in sub-Saharan Africa (SSA) have historically focused on primary health care to address the high rates of communicable diseases. However, with increasing rates of road trauma along with other life-threatening conditions such as non-communicable diseases like cardiac arrest and stroke that require urgent medical attention, many countries must now also look to develop functional Emergency Medical Services (EMS). Providing efficient and effective post-crash care and pre-hospital treatment for injuries, hemorrhage, and other medical and obstetrical emergencies under normal operating conditions become even more critical during disasters or conflict situations. They should also be made a priority due to the increasing morbidity and mortality from medical, surgical and obstetrical emergencies.

According to World Health Organization (WHO), Road Traffic Accidents (RTAs) are currently the 8th leading cause of death globally and the 10th leading cause in SSA, resulting in more than 1.4 million deaths per year worldwide in 2016 and 284,000 in SSA. Road injuries do not strike the population equally, and some groups are more vulnerable than others. Globally, RTAs are the leading cause of death for children, adolescents, and young adults aged 5-29 years, and yet have been long neglected in the health agenda for this group. Additionally, more than half of all road traffic deaths are among vulnerable road users including pedestrians, cyclists and motorcyclists. Differences are noticeable between regions: while pedestrians and cyclists represent 26 percent of all deaths worldwide, they represent 44 percent of deaths in Africa. More generally,

Africa is the continent with the highest rate of road traffic deaths with 26.6 deaths per 100,000 population in 2016, compared to 18.2 worldwide.

It is now estimated that by 2030 the number of RTA deaths could conceivably increase by 30 percent to 1.85 million fatalities annually, making it the 7th leading cause of death globally. Unfortunately, the RTA death rate in SSA is 25 percent higher than the global average (2015) and it is projected to increase a further 72 percent by 2030 to 38 fatalities per 100,000 population. For SSA, the challenge is even more pressing – if RTAs were to double to 514,000 annually, they would potentially become the 6th leading cause of death by 2030 – making RTAs responsible for more deaths than pre-term birth complications or malaria (ranked 7th and 8th, respectively).

Recognizing the enormity of this challenge, a global strategy – the Decade of Action for Road Safety (2011-2020) – was established by the WHO and the United Nations (UN) regional commissions and other stakeholders. Addressing RTAs and fatalities would require concerted efforts to implement a range of activities across five main pillars: road safety management, safer roads and mobility, safer vehicles, safer road users and post-crash response. With a specific aim to increase responsiveness to post-crash emergencies and improve the ability of health and other systems to provide appropriate emergency treatment and longer term rehabilitation for crash victims, the post-crash response pillar acknowledges the importance of developing prehospital care systems by implementing a single nationwide emergency telephone number, the ability to extract victims of road traffic incidents from a vehicle after a crash, and developing hospital

trauma care systems with an ability to evaluate the quality of care through good practice principles and quality assurance measures. Disappointingly, efforts to date have proven to be insufficient to reach the Sustainable Development Goal (3.6) of halving the number of road traffic deaths by 2020.

To further advance the urgency and advocacy for effective road safety interventions, the Third Global Ministerial Conference on Road Safety that convened in Stockholm, Sweden in 2017 acknowledged the role that improvements in road safety must play towards achievement of other Sustainable Development Goal targets by 2030. The forum afforded key stakeholders a platform for reviewing progress in the Decade of Action for Road Safety 2011-2020 and would eventually lead to setting 12 Voluntary Global Road Safety Performance Targets to reduce road traffic fatalities and injuries. With a continued focus on the five pillars and guided by the "Stockholm Declaration", which recasts the global goal to reduce road traffic deaths and injuries by 50 percent by 2030, one of the 12 targets calls upon all countries to "establish and achieve nationally endorsed metrics that minimize the time interval between road traffic crash and the provision of first professional emergency care"[1]. Unfortunately, the SSA region represents the largest group of countries (by population) without effective "Pre-hospital and Emergency Care Services" (PECS) to help reduce road traffic deaths and injuries.

## Goals and Objectives of the Report

An evaluation of the various EMS models and mechanisms in place in SSA is critical in order to have a better understanding of what can

be improved upon for effective PECS. With grant funding provided by the Global Road Safety Facility (GRSF), this report aims explore the **State of EMS Systems in Sub-Saharan Africa** through a review of the models and mechanisms being developed across various States. The premise of the report focuses on the fundamentals for effectively providing satisfactory treatment to those in need of urgent medical care, while also recognizing that there are multiple pathways, framed by the respective legislative, legal and regulatory enabling environments, towards a more formal and sustainable EMS model. It represents an effort to identify the major similarities and differences, as well as potential opportunities for greater coordination or collaboration, that can lead to the development of sound policy recommendations for fostering and expanding post-crash response services in the region.

High-level system information has been collected through questionnaires (Annex 1) distributed to National Respondents in each country, for which 25 of 44 countries[2] substantially responded[3] as of April 2019 (collectively hereinafter referred to as SSA countries): Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo Brazzaville, Gabon, Lesotho, Liberia, Madagascar, Malawi, Mauritania, Niger, Rwanda, Senegal, Sierra Leone, Sudan, Tanzania, Togo, Uganda, Zambia and Zimbabwe. Missing data and discrepancies triggered a detailed review of laws and other regulatory acts, policy and plan. The Report does not consider the advantages and disadvantages for the EMS models adopted by SSA countries, nor does it take a position on which regulatory approach should be applied, or measure the degree of EMS standards implementation and the success

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[1] https://www.who.int/violence_injury_prevention/road_traffic/12GlobalRoadSafetyTargets.pdf?ua=1
[2] Four countries had no active Health, Nutrition and Population (HNP) Portfolio or no Task Team Leader during the data collection period. More information provided in Chapter 1.
[3] No data used in this review were obtained by the authors on site.

or failure of implementing various EMS policies. The principal aim of this report is to capture the current range of the standards and regulations in key areas of EMS systems across SSA. It begins with an introduction to **Pre-Hospital Emergency Care Systems (PECS)** in Chapter 1, highlighting the importance of improving health outcomes through advanced deployment of emergency medical assistance.

Chapter 2 reviews the various **EMS Governance and Standards**; chapter sections relate to EMS governance including legislation and governance arrangements, interagency arrangements, the current state of EMS in each country, provider authorization, standards and inspection and vehicle standards; followed by EMS standards including EMS delivery planning and standards and EMS dispatch; and EMS human and other resources.

Chapter 3 looks closer into **EMS Financing Arrangements** across SSA, presenting policy frameworks, funding allocation, provider payments and insurance schemes.

A comprehensive review of the regional standards and approaches being used for the **EMS Training** is presented in Chapter 4, including a review of the overall organization of EMS training and the specific approaches used in various SSA countries for the training of physicians, nurses, other EMS professionals, and first responders. The EMS professional practice authorizing environment as well as the financing of EMS training are also reviewed.

Chapter 5 completes the review of the survey results by reporting on the current state of **EMS Communication Standards**, with a focus on the arrangements for public access to EMS services, EMS dispatch and control, interagency communications and EMS services and medical control communications related to EMS.

Chapter 6 of this report sets out core aspects in the **Design Considerations of EMS Systems**, including cases studies on piloting, development and scale-up for EMS systems in both SSA and elsewhere, as well as two case studies on improvement of EMS systems in partnership with the World Bank.

Finally, Chapter 7 brings the various parts of the report together by focusing on **Implementation: Issues and Opportunities.** The chapter concludes with a discussion of the opportunities for harmonization of EMS standards between countries in SSA as well as a summary of general conclusions and considerations for comprehensively developing EMS systems and services.

**Country Profiles** have been included as an Annex to the report to present a snapshot of each participating country's individual responses to the EMS survey work, highlighting potential gaps that deserve more focused attention.

## Report Findings and Recommendations

Across SSA, continual enhancement and improvements in emergency care have been observed over recent years. Overall, the survey findings reveal that very few countries have developed a systematic and financially sustainable approach to delivering EMS services at scale, defined by proper governance arrangements, staffed by knowledgeable personnel and coordinated through clear data management and communications channels that are crucial for an efficient and effective EMS system. This becomes even more pressing during and post-COVID-19 pandemic, both due to the lack of resources in many countries to improve prehospital care, and the increasing need to transport seriously ill COVID-19 patients to higher levels of care.

Primary observations have been grouped around the four main themes of the survey, followed by general recommendations that can be considered for deeper analysis within the countries' respective contexts. It also aims to provide the prospects for aligning and harmonizing EMS at a regional level.

## 1. EMS Governance and Standards

◊ There are wide variations in the state of EMS systems from country to country, especially as it pertains to formalizing establishment and funding modalities, availability and expectations of educational and training programs, and development of necessary EMS communication protocols. EMS systems across SSA countries are widely diverse as to their basic models (Anglo-American versus Franco-German model), institutional mandates, organizational roles and functional dynamics. Consequently, this diversity implies that harmonization of standards and regulatory approaches should be distinct to the respective model, both in the overall EMS governance framework and the provision of requisite tools and instruments for meeting EMS objectives and measuring care outcomes.

**There is a clear need for institutional reforms that focus on elevating national regulatory requirements – in accordance with international standards – as fundamental to the efficiency, effectiveness and sustainability of EMS systems.** The absence of legislation and legal provisions in many SSA countries can confuse institutional mandates or hamper coordination among various agencies, leave service quality and sanitation standards undefined, and limit or hinder the functionality of dispatch systems and communication protocols.

**Well-functioning EMS systems provide a critical component to effective emergency preparedness and response capability within a broader disaster risk reduction strategy.** Countries should look to put in place legal provision for interagency coordination and communication in emergency situations. Further development in EMS interagency communications and EMS dispatch are essential to improving response capabilities necessary for pre-hospital care outcomes. This appears to be occurring in very few SSA countries and for isolated components. The full integration of the communications, dispatch and information systems is crucial to incident management, reporting and performance monitoring.

◊ All SSA countries report national policies relating to universal service and the content of universal service adopted as part of action plans within CEMAC, ECOWAS, SADC and UEMOA initiatives. These regional organizations have prompted agreements by Member States to make available to their respective population, regardless of their geographic location, EMS call services that are offered toll free or at minimal price, while ensuring service continuity. They all include access to emergency services. The differences between SSA countries in terms of universal access concerns the implementation of such service, as national regulators are obliged to comply with their respective civil codes.

**The universal access/service fund offers the premier mechanism to promote universal access/service development for emergency telecommunications at a national level across SSA countries in a manner that indemnifies the universal access/service providers.** All telephone terminal equipment should have the ability to enable a user to make an emergency call once the device has access to a public telecom network (of a compatible design). Network operators must make every reasonable effort to ensure the answering, inter-network forwarding and termination of

emergency calls. To further support emergency service operations each emergency call should be accompanied with information related to caller identity, location and mobile terminal equipment.

◊ There are no SSA countries in the responding group that could serve as a benchmark for harmonization of standards and legislative approaches of EMS system. As might reasonably have been expected, the EMS governance provisions surrounding both human and financial resources revealed material differences in the substance of EMS standards and requirements between SSA countries.

**Concentrated efforts in formalizing or improving EMS systems as a crucial component of the overall health system strengthening process is vital to post-crash response outcomes.** It is strongly recommended that any discussions regarding the harmonization of standards and regulatory approaches should keep a health system strengthening perspective as a guiding principle through synchronization of EMS provision, governance, financing and human resources requirements. Organizing the EMS system as a formal service within the health system, including all core administrative elements (leading authority, organizational structure/chart, tiers of EMS system, agencies and providers' responsibilities, jurisdiction and catchment areas for public and private EMS providers, etc.), will ultimately set the foundation for continuity in the provision of health services.

## 2. EMS Financing Arrangements

◊ Although most SSA countries report free EMS for households and individuals, budgetary resources or cost recovery mechanisms for EMS are limited and, in many cases, no funding formulas are in place to ensure financial sustainability of the respective EMS system. Insurance schemes for EMS vary greatly across countries. Payment mechanisms for EMS providers are generally weak.

**Funding options need to be carefully evaluated to confirm an appropriate mix of financing sources that provide stable revenue streams for system management, both in terms of upfront capital costs as well as ongoing operational expenses. This includes mobilizing enough domestic r**esources of various types towards EMS delivery and embedding EMS/PECS as a core component of the health system strengthening model. This is especially true when the initial capital outlays are provided through external or donor financing, whereby the approach is likely to acquire all necessary equipment and supplies within a short period of time.

**In developing a financing strategy, careful attention needs to be given to downstream financing needs for fleet management as a core tenant of the EMS system.** When such assets are not properly cared for or scheduled to be replaced, operating costs are likely to increase due to the need for extensive maintenance, or service levels are likely to decline as vehicles and equipment become unusable, either intermittently due to maintenance requirements, or permanently, or perform below acceptable standards. Hence, a crucial element for ensuring EMS program sustainability is effective life cycle and asset replacement planning. An effective fleet management program can help to maximize vehicle life so that those that are used in the high-kilometer districts don't prematurely fall into a state of disrepair. A robust and well-funded replacement program for vehicles and other resources is essential to ensure the continuous smooth functioning of EMS.

## 3. EMS Training

◊ EMS terminology varies across the sub-region, lack standardized definitions, leading to nomenclature that is used interchangeably.

**Recognized international and regional institutes for medical standards** development include the International Federation for Emergency Medicine, the European Society for Emergency Medicine, the African Federation of Emergency Medicine, the College of Medicine of South Africa, among others, which **must be contextualized according to the EMS system model in place.**

◊ Standardized accreditation of EMS training programs across SSA are non-existent. However, post-graduate EM training has improved with training programs in development and twinning partnerships on the rise in the sub-region.

**Countries must consider how to elevate one entity or authority responsible for regulating the EMS education system.** Standardized accreditation of training programs or education institutions for Emergency Medicine or accreditation of qualifications attained in individual SSA countries offers the highest potential for regional harmonization. Individual recognition of training and qualifications is decided at the national level according to each national authority's rules. Based on the findings of the surveys, harmonization of EMS training aspects may be best tackled at the sub-regional level (e.g., anglophone versus francophone countries), recognizing the different EMS models and approaches within these countries respective health systems. To succeed with harmonization interventions, there is a need for ensuring that national authorities acknowledge the core competencies in EMS delivery when approving EM training programs. Crisis and disaster management should invariably be part of any EMS training curriculum.

## 4. EMS Communication Standards

◊ EMS Communications has improved in SSA with all countries reporting National Numbering Plans, an authority responsible for regulation and coordination of the numbering resource of the country, emergency services numbering alignment with the International Telecommunication Union Recommendation E.161.1 and the numbers are free of charge.

**The most salient recommendation related to public access is the allocation of a single emergency number to call in the event of a medical emergency.** For those countries that operate multiple emergency numbers, the opportunity of shifting to a single emergency call number must be critically assessed, including an examination of the implementation timeframe, technology implications/readiness, market (population) readiness, public safety services availability and awareness, regulatory implications and financial human resources requirements, among other considerations. An EMS system that has adopted the single emergency number or specific number for medical emergency provides the public the basic means to more readily access prehospital emergency care system. SSA countries are encouraged to establish regulations on interagency coordination, whereby: (i) the incoming call is first handled by the receiving PSAP; and (ii) the call is immediately transferred to the responsible PSAP for incident response/service or the receiving PSAP may transfer the call directly to the relevant ECC, which are transferred together with requisite location details and other pertinent data for incident management.

◊ Though organization of PSAPs and ECCs tend to be structured based on the uniqueness of each country context, call center and

dispatch systems for EMS services remain in a nascent stage in SSA.

**The utilization of dispatch or data management systems in SSA needs to be considered as an essential element of the development of any EMS/PECS system.** First and foremost, this includes a well-developed priority dispatch management system that allows the processing and monitoring of all calls and collects information on their progress and disposition[4]. Systems to receive a call requesting assistance for an emergency victim represents an initial step but must be followed by a coordinated response effort to be truly effective. The ability to dispatch a wide range of emergency resources and personnel is also recommended, given the wide availability of mobile phone technologies and the comparative lack of emergency response vehicles. With advances in EMS communications mainly driven by the telecommunication industry, implementing an EMS communications system must necessarily consider both the current status of a country's EMS provision, as well as existing telecommunications infrastructure and regulations. This includes accepted standards for functional performance, as well as local market readiness, geographic and socioeconomic conditions. Ministries and agencies responsible for designing EMS system architecture must be prepared to modify the governance frameworks and regulatory specifications as the EMS system matures. These areas must rely mainly on the organizational structure of the EMS system they are supporting, including

designed jurisdictions and/or catchment areas.

◊ Some countries have looked to pilot specialized Trauma Registries that provide longitudinal data on trauma patients in order to develop a better understanding different types of trauma patients and what can be done to improve overall outcomes.

**A critical impediment to EMS development across the region is a lack of emphasis on data driven decision making that is informed by robust information eco-systems.** Appropriate patient call records (preferably electronic) that collects and records patient level clinical, demographic and temporal data from the time a call is received until the patient is delivered to the emergency department is also crucial. Ideally, this should link to a hospital-based electronic health record to allow the development of a complete longitudinal record for each patient[5]. In addition to basic demographic information, such registries also include information on the mode of arrival (ambulance, private vehicle, etc.), the mechanism of injury, the state of the patient upon arrival, vital signs at various times during a patient's stay in the facility, treatments provided, and eventual outcomes. In more established trauma registries, this includes follow-up at 30 days beyond hospital discharge to determine longer-term outcomes. Once such data ecosystems are developed, and appropriate patient privacy and confidentiality measures are in place, they can also contribute to improved research on the impact of PECS/EMS on the health and well-being of the population,

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[4] Call center dispatch systems should be capable of recording incident details, location verification, unit and incident display, incident dispatch, integration with mobile data terminals and unit recommendation, time stamping and mapping, and systematic categorization and prioritization of calls according to the clinical urgency of patient's condition.

[5] Specialized Trauma Registries (TR) can provide longitudinal data on trauma patients (especially where electronic systems are not fully developed) in order to develop a better understanding different types of trauma patients and what can be done to improve overall outcomes. In addition to basic demographic information, such registries also include information on the mode of arrival (ambulance, private vehicle, etc.), the mechanism of injury, the state of the patient upon arrival, vital signs at various times during a patient's stay in the facility, treatments provided, and eventual outcomes. In more established trauma registries, this includes follow-up at 30 days beyond hospital discharge to determine longer-term outcomes.

including providing region-specific evidence, including outcomes on post-crash response.

## Prospects for Aligning and Harmonizing EMS Enabling Environment

Importantly, the report evaluates the degree to which harmonization can offer potential benefits beyond individual countries or groups of countries. The existence of regional harmonized standards and regulatory frameworks can promote integration of health service systems more broadly, as well as specifically in the area of EMS, through the easier movement of qualified staff (labor mobility), standardized communications approaches (for improved coordination in the case of natural disasters or cross-border mass casualty emergency response incidents), increased private sector participation, including public-private partnership (PPP) or potential cost savings opportunities by strengthening purchasing power through coordinating acquisition of ambulances, equipment and supply stocks.

**At the regional level, there are opportunities to harmonize activities and policies between SSA countries.** Greater emphasis placed on the establishment or convening of pan-African (e.g., AU, Africa CDC) or sub-regional forums (e.g., ECOWAS, SADC, EAC) would encourage States to explore and identify possible synergies for strengthening EMS systems. For instance, a dedicated regional or sub-regional forum could lead on defining institutional mandates, EMS terminology and standardizations that support common ecosystems for rationalizing EMS service expectations that embed practices to integrate EMS as part of universal health coverage across the sub-region. Regional institutions could lead on shaping or harmonizing approaches to medical or auto industry insurance policies that enable or facilitate cost recovery

of EMS service provision. EMS education, training and certification programs can be uniformly designed at a regional level or across SSA, while also organizing twinning programs and other partnerships that can be optimized.

**At a country level, governments should elevate the priority of EMS systems within Ministries of Health, as well as coordination between other ministerial stakeholders more generally, to facilitate more effective prehospital care.** In many instances, this includes mobilizing enough domestic resources of various types towards EMS delivery and embedding EMS/PECS as a core component of the health system strengthening model. Legal provisions and regulatory frameworks that adopt regional and international guidelines should be introduced or revised to align service and quality standards. Countries must also acknowledge the importance of access to prehospital emergency care in underserved and remote communities. Increased and targeted funding or financing modalities toward training, knowledge and management of EMS personnel is also crucial to effective and reliable information systems.

**Researchers, professional associations and regional entities should continue to deepen their discussions, research, and knowledge exchanges on the relative impacts that functional PECS/EMS systems can achieve in reducing road trauma fatalities.** Organization and consortiums such as African Federation of Emergency Medicine and Africa Road Safety Observatory offer platforms can help to elevate efforts these efforts. A continental or regional research agenda should be developed as a top priority to ensure data is collected and analyzed to inform future directions. More emphasis on developing a larger cadre of EMS practitioners and researchers through partially and fully financed fellowship programs can be explored. Centers of excellence should be

established to facilitate research on technical and managerial aspects of PECS/EMS services.

SSA countries are experiencing a double burden of disease; increasing mortality rates from non-communicable diseases – with road trauma fatalities sadly a leading indicator – coupled with the prevalence of communicable diseases in Africa. While road accident and fatalities rates across the region may be attributable to a combination of poor vehicle standards, road infrastructure, and safety behaviors, the absence or shortage of post-crash response (whether in the form of trained emergency personnel, available ambulatory services, or emergency call centers) will ultimately compromise a patient's recovery, potentially incur preventable physical disabilities and may well witness a continued rise in mortality rates from road trauma. Hard-won gains in human capital development can be quickly lost. Together with development partners, countries should look towards investments that prioritize EMS/PECS as an essential element of health system strengthening and access to universal healthcare.

# CHAPTER 1
# Pre-Hospital and Emergency Care Services (PECS)

# CHAPTER 1: Pre-Hospital and Emergency Care Services (PECS)

## I. Introduction

Health system investments in sub-Saharan Africa (SSA) have historically focused on primary health care to address the high rates of communicable diseases. However, with increasing rates of road trauma along with other life-threatening conditions such as non-communicable diseases like cardiac arrest and stroke that require urgent medical attention, many countries must now also look to develop functional Pre-Hospital and Emergency Care Services (PECS) systems. Providing efficient and effective post-crash care and pre-hospital treatment for injuries, hemorrhage, and other medical and obstetrical emergencies under normal operating conditions become even more critical during disasters or conflict situations. They should also be made a priority due to the increasing morbidity and mortality from medical, surgical and obstetrical emergencies.

According to World Health Organization (WHO), RTAs are currently the 8th leading cause of death globally and the 10th leading cause in SSA, resulting in 1.402 million deaths per year worldwide in 2016 and 284,000 in SSA. Road injuries do not strike the population equally, and some groups are more vulnerable than others. Globally, RTAs are the leading cause of death for children, adolescents, and young adults aged 5-29 years, and yet have been long neglected in the health agenda for this group. Additionally, more than half of all road traffic deaths are among vulnerable road users including pedestrians, cyclists and motorcyclists. Differences are noticeable between

regions: while pedestrians and cyclists represent 26% of all deaths worldwide, they represent 44% of deaths in Africa. More generally, Africa is the continent with the highest rate of road traffic deaths with 26.6 deaths per 100,000 population in 2016, compared to 18.2 worldwide.

It is now estimated that by 2030 the number of RTA deaths could conceivably increase by 30 percent to 1.85 million fatalities annually, making it the 7th leading cause of death globally. Unfortunately, the RTA death rate in SSA is 25 percent higher than the global average (2015); worse still, it is projected to increase a further 72 percent by 2030 (to 38 fatalities per 100,000 population). For SSA, the challenge is even more pressing - if RTA's were to double to 514,000 annually, they would conceivably become the 6th leading cause of death by 2030 – making RTAs responsible for more deaths that either pre-term birth complications or malaria (ranked 7th and 8th, respectively).

Recognizing the enormity of this challenge, a global strategy - the Decade of Action for Road Safety (2011-2020) – was established by the WHO and the United Nations (UN) regional commissions and other stakeholders. Addressing RTAs and fatalities would require concerted efforts to implement a range of activities across five main pillars: road safety management, safer roads and mobility, safer vehicles, safer road users and post-crash response. With a specific aim to increase responsiveness to post-crash emergencies and

improve the ability of health and other systems to provide appropriate emergency treatment and longer term rehabilitation for crash victims, the post-crash response pillar acknowledges the importance of developing prehospital care systems by implementing a single nationwide emergency telephone number, the ability to extract victims of road traffic incidents from a vehicle after a crash, and developing hospital trauma care systems with an ability to evaluate the quality of care through good practice principles and quality assurance measures. Disappointingly, efforts to date have proven to be insufficient to reach the Sustainable Development Goal of halving the number of road traffic deaths by 2020.

To further advance the urgency and advocacy for effective road safety interventions, the Third Global Ministerial Conference on Road Safety that convened in Stockholm, Sweden in 2017 acknowledged the role that improvements in road safety must play towards achievement of other Sustainable Development Goal targets by 2030. The forum afforded key stakeholders a platform for reviewing progress in the Decade of Action for Road Safety 2011-2020 and would eventually lead to setting 12 voluntary Global Road Safety Performance Targets to reduce road traffic fatalities and injuries. With a continued focus on the five pillars and guided by the "Stockholm Declaration", which recasts the global goal to reduce road traffic deaths and injuries by 50% by 2030, one of the 12 targets calls upon all countries to establish and achieve nationally endorsed metrics that minimize the time interval between road traffic crash and the provision of first professional emergency care.[6]

SSA represents the largest group of countries (by population) without effective PECS systems.

Within the overall PECS system – which includes both pre-hospital and in-hospital care – the pre-hospital Emergency Medical Services (EMS) systems appear to be particularly undeveloped. It is these systems that are the focus of this report. With grant funding provided by the Global Road Safety Facility (GRSF), this report aims explore the State of EMS Systems in Sub-Saharan Africa, through the models and mechanisms being developed across various States as an effort to identify the major similarities and differences, as well as potential opportunities for greater regional coordination or collaboration as a step towards developing sound post-crash response capabilities.

High-level system information has been collected through questionnaires distributed to 44 National Respondents[7] that provided insights into how EMS services are funded, in addition to relevant legislative and regulatory approaches, standards and operational policies in each country. National Respondents had to have a good knowledge of EMS in the Ministry of Health and/or another public central authority or private sector responsible for EMS. There were four focus areas: (i) EMS Governance and Standards; (ii) EMS Financing; (iii) EMS Training; and EMS Communications. Data collection took place between October 2018 and April 2019. Questions were structured as multiple choice and open-ended and answers were to be based exclusively on legislation in force. Twenty-five out of 44 SSA countries substantially responded (57 percent response rate) collectively hereinafter referred to as SSA countries: Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo Brazzaville, Gabon, Lesotho, Liberia, Madagascar, Malawi, Mauritania, Niger, Rwanda, Senegal, Sierra Leone, Sudan, Tanzania, Togo, Uganda, Zambia

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[6] https://www.who.int/violence_injury_prevention/road_traffic/12GlobalRoadSafetyTargets.pdf?ua=1
[7] Questionnaires were shared with Task Team Leaders to share with National Respondents. No data used in this review were obtained by the authors on site.

and Zimbabwe. No engagement was possible in several countries due to the political instability or no active HNP portfolio.[8] Several countries were non-responsive or unable to identify a focal point to complete the questionnaire. Missing data and discrepancies triggered a detailed review of laws and other regulatory acts, policy and planning documents, charters and statutes, official websites, reports and other materials. For more information, please refer to the Country Profiles (Annex 4).

While the focus is on EMS systems, it is important to understand how effective PECS systems function, and how EMS systems operate within the context of the overall PECS system. This will be the focus of the next few sections of the report, followed by a discussion of the potential contribution of EMS, and PECS systems more generally, to the overall health of the population and broader health systems development and management.

# II. The importance of PECS

In 2007, the World Health Assembly (WHA), the governing framework for the World Health Organization (WHO), called on governments to strengthen their focus on pre-hospital and emergency trauma care systems (including mass casualty management efforts). This was one of the first WHA resolutions in this area, leading to the recognition of pre-hospital and emergency care as a critical element of the health care system in all countries. Adopting a resolution on emergency trauma care systems, the Assembly counselled WHO member countries to take urgent action, identifying key measures necessary to improve the state of readiness and capacity for delivering critical care services, including the following which are most germane to this report [9]:

• Conducting comprehensive assessment of the prehospital and emergency-care context including, where necessary, identifying unmet needs;

• Considering the establishment of formal, integrated trauma and emergency-care systems, as well as the potential to draw on informal systems and community resources in

order to establish prehospital-care capacity in areas where formal, prehospital, emergency medical-care systems are impractical;

• Maintaining or developing robust monitoring mechanisms that provide pertinent information and assure minimum standards for training, equipment, infrastructure and communication as a core element of formal, emergency medical-care systems;

• Establishing a universal-access telephone number, together with broad public awareness to contact emergency medical-care systems;

• Ensuring that appropriate core competencies are part of relevant health curricula and to promote continuing education for providers of trauma and emergency care;

• Reviewing and updating relevant legislation, including where necessary financial mechanisms and management aspects, to ensure that a core set of trauma and emergency care services are accessible to all people who need them.

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[8] Sao Tome and Principe, Equatorial Guinea, Eritrea, and Benin (No HNP TTL at the time of data collection).
[9] World Health Assembly, Resolution 60.22, page 1

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**Box 1 - World Health Assembly 2007[10]**

Each year worldwide more than 100 million people sustain injuries, … more than five million people die from violence and injury, and … 90% of the global burden of violence and injury mortality occurs in low- and middle-income countries; … improved organization and planning for provision of trauma and emergency care is an essential part of integrated health-care delivery, plays an important role in preparedness for, and response to, mass-casualty incidents, and can lower mortality, reduce disability and prevent other adverse health outcomes arising from the burden of everyday injuries.

## II. 1 What is a PECS system ?

In the April 2019 session of the WHA, WHO reiterated the importance of pre-hospital and emergency care systems, and also reinforced the link between such systems and Universal Health Coverage (UHC), stating "Emergency care is an essential element of universal health coverage, responding to a range of acute conditions in children and adults, including injuries, infections, acute exacerbations of noncommunicable diseases, and complications of pregnancy. It is the first point of contact with the health system for many people, providing timely recognition of time-sensitive conditions, resuscitation and referral for severely ill patients, and the delivery of definitive care for many others. Especially when there are barriers to accessing health care, people may seek care only when they are acutely ill or injured." [11]

Broadly speaking, a PECS system consists of several functional elements designed to provide early and effective treatment to victims of injuries, acute medical emergencies or serious obstetrical conditions. An effective PECS system includes both out-of-hospital and in-hospital components. Such aspects can range from securing the scene and extracting the injured, to the provision of initial first aid by lay first responders, to trained medical or paramedical personnel providing life-sustaining or life-saving care and transport prior to arrival at the hospital, to the provision of definitive care in a hospital environment. This latter step may involve transferring the patient from a community or district hospital to a more fully equipped and staffed trauma or tertiary medical referral center.[12]

There are several key differences between PECS systems and other components of the health system. For example, unlike primary care, PECS must operate 24 hours – 7 days a week. The pre-hospital component of a PECS system must also operate in extreme environments, such as inclement weather or difficult geography, as well as in potentially dangerous situations of conflict or unrest. Furthermore, PECS systems are a critical

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[10] Ibid, page

[11] World Health Organization, Seventy-Second World Health Assembly, A72/31, Provisional agenda item 12.9, 8 April 2019

[12] Debas, H. T., P. Donkor, A. Gawande, D. T. Jamison, M. E. Kruk, and C. N. Mock, editors. 2015. Essential Surgery. Disease Control Priorities, third edition, volume 1. Washington, DC: World Bank. doi:10.1596 /978-1-4648 -0346-8., p. 246

element in disaster preparedness and response. Being on the frontline of acute care also has a key role in disease surveillance and epidemic response. Lastly, unlike other parts of the health system that can function in isolation, a well-functioning PECS system relies on multiple sub-systems working together to provide high quality results.

In this context, a crucial element of the entire system is effective communication infrastructure and protocols between various actors in each of the system components throughout the episode of care from the time an injury or medical emergency is first observed until definitive care is given.

## Box 2 - Potential Impact of PECS on the Burden of Disease

Each Pre-hospital and emergency care and systems can potentially address 54 percent, or 24.3 million, of the approximately 45 million deaths in Lower- and Middle-Income Countries each year. This loss translates into a staggering 1,023 million Disability Adjusted Life Years (DALYs), or 932 million years of life lost (YLL) to premature mortality. From a morbidity perspective, this disease burden translates into 91.4 million years lived with disability (YLD). While ischemic heart disease and cerebrovas¬cular disease contribute the largest number of deaths, unintentional injuries are the single largest contributor to the DALYs. The largest contributors to YLL are unintentional injuries, lower respiratory infections, and ischemic heart disease.[6]

# III. Nature of PECS

The core elements and processes of a functional PECS system, as well as the typical flow of PECS responses, are highlighted in the schematic presented below (Figure 1), which outlines key steps and actors involved in an episode of care which starts in the pre-hospital environment and includes intervention by ambulance services. System processes are initiated once it is recognized that help is needed with a serious injury or illness (1)[13] – either by the patient themselves, a family member or a bystander – when a call is made (2) to an emergency dispatch center (3).

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[13] Numbers in parenthesis refer to the relevant number in Figure 1.

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Figure 1 - Prehospital and emergency care system elements and process



① Injured or ill patient

② Call for help

③ Call receiving and dispatch

④ Communications system

⑤ First responders receive call and respond

⑥ Ambulance receives call and responds

⑦ Ambulance travels to patient

⑧ Care at scene

⑨ Care *en route* to hospital

⑩ Treatment in ER

⑪ Treatment in hospital

Outcomes

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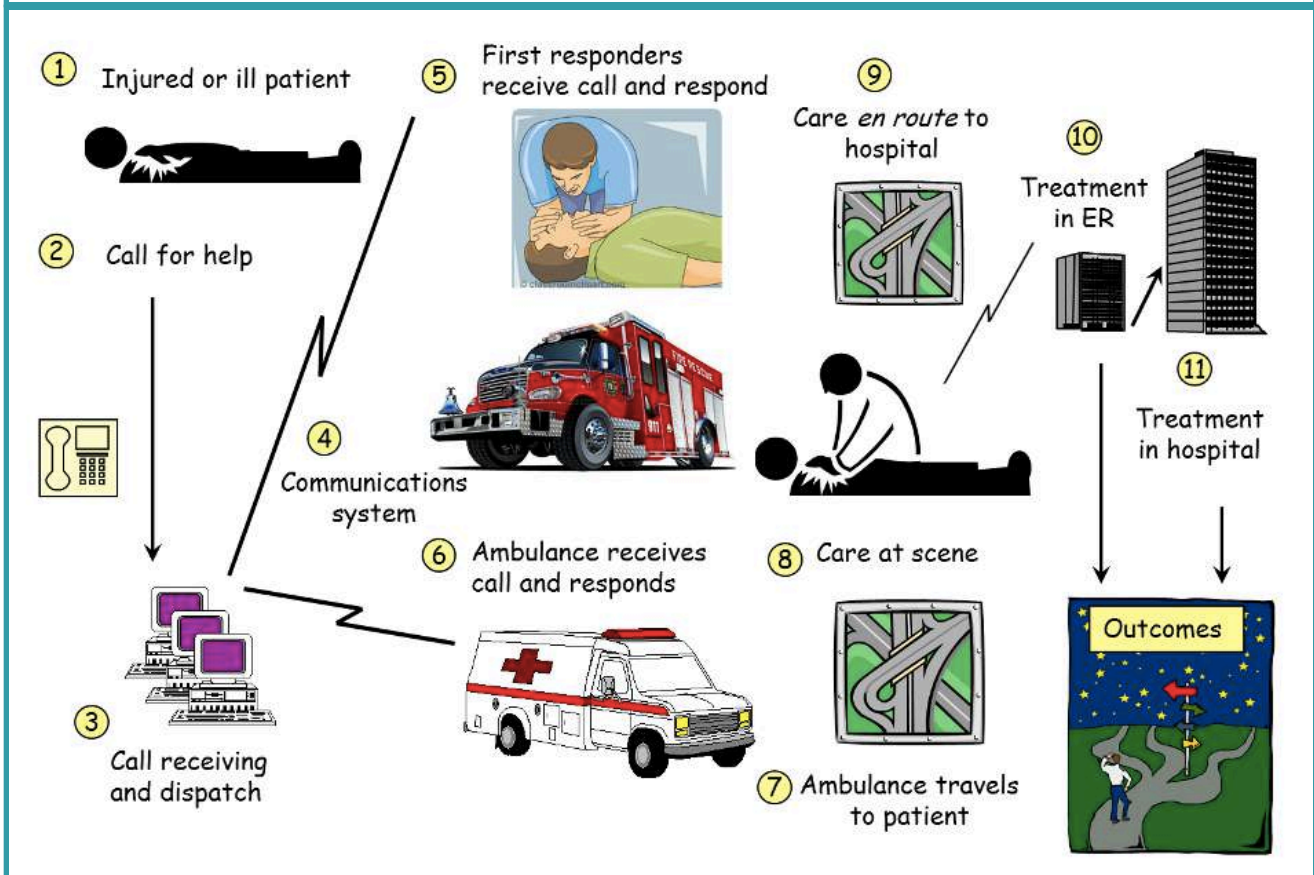
Based on the information provided to the dispatch center, decisions are made on which resources to dispatch to the scene of the injury or illness. Often, these decisions are aided by a dispatch system that can determine the closest ambulance(s), as well as recommend appropriate resources based on the description of the injury or illness. In order to relay these dispatch decisions to the appropriate responders, a well-functioning communications system is essential.

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## Box 3 - Emergency "short code" numbers

Many countries have dedicated "short code" emergency numbers, such as 9-1-1 in the United States, 1-0-8 in India, and 1-1-2 in Europe. This makes it quicker and easier to call emergency services. Some of these short codes are used for all emergency services (police, fire and ambulance/EMS, while others are particular to the EMS service.

Usually, several modes of communication (e.g., two or more devices, such as Very-High Frequency (VHF) radios, two-way "walkie-talkie" radios, and/or mobile phones) that are used to ensure at least one functional mode of communications is always available (4).

Among the resources that may be dispatched, "first responders" (5) constitute a cadre of essential actors. These may include medical first responders that are trained in first aid. Or it might include lay people in the community, designated groups such as truck drivers or others who are more likely to be around when emergencies (such as road traffic accidents) occur, or other emergency personnel such as police officers or fire fighters. The purpose of community first responders is to secure the scene, begin basic triage, provide basic first aid until the ambulance arrives on the scene or, when appropriate, cancel the ambulance prior to its arrival if it is not required.

In the case of road traffic accidents and other situations involving either unstable environments (for example, downed electrical wires or gasoline leaking onto the roadway) or trapped victims, fire rescue personnel are often called upon as non-medical first responders. Rescuers secure the scene in terms of hazardous materials and work to extricate persons so that medically trained personnel can provide patient treatment.

Once the ambulance crew receive a call from the dispatch center (6), they travel[14] to the scene of the injury or illness (7). This travel time is also referred to as the "response time" and it is a key metric that is often used to evaluate the effectiveness and performance of a PECS system. Once the ambulance arrives at the scene, the crew will generally take over the care of the patient from

any first responders and begin their own treatment (8). A critical decision point for an ambulance crew is determining how much time to spend on the scene and when to transport the patient. As soon as the decision to transport is made, the patient is prepared to be moved and taken to the hospital while being provided further care en route (9).

The first point of contact in the hospital is usually an emergency room/emergency department (ER/ED), or an accident and emergency department (A&E) (10). The patient is often given definitive care in the ER but may require further diagnostic or surgical interventions in other facilities at the hospital (11). Depending on the severity of the case, the patient may be treated in the emergency department and released, but for serious cases the patient may need to be admitted to hospital for further treatment and recuperation.

There are, however, other potential ways of accessing the PECS system (see Figure 2). This includes patients arriving independently to ERs, as well as inter-facility transfers of ill or injured patients, or obstetrical emergencies to higher levels of care.

A well-functioning PECS system needs to be available to respond to all critical situations, including (a) direct pre-hospital calls, as described above, (b) inter-facility transfers from lower levels of care to the hospital, or (c) referrals between hospitals, as well as meeting the needs of patients who travel on their own to health center or hospital emergency rooms. A critical element of the entire system is the coordinating function of the dispatch center, shown on the right of the diagram, regardless of whether the ambulance is used for pre-hospital emergency or urgent transfers between facilities.

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[14] The mode of travel can range from traditional ambulances (two-wheel or four-wheel drive), to motorcycle or bicycle powered stretchers (e.g., in Uganda, Mali, Kenya, Mozambique, or Ghana) or even boats depending on the terrain. In many cities where traffic congestion is a problem an initial response may be made by a lone responder (doctor or paramedic) in an automobile or on a motorcycle to get to the patient as quickly as possible and begin interventions prior to the arrival of the ambulance.

Figure 2 - Prehospital and emergency care system elements and process
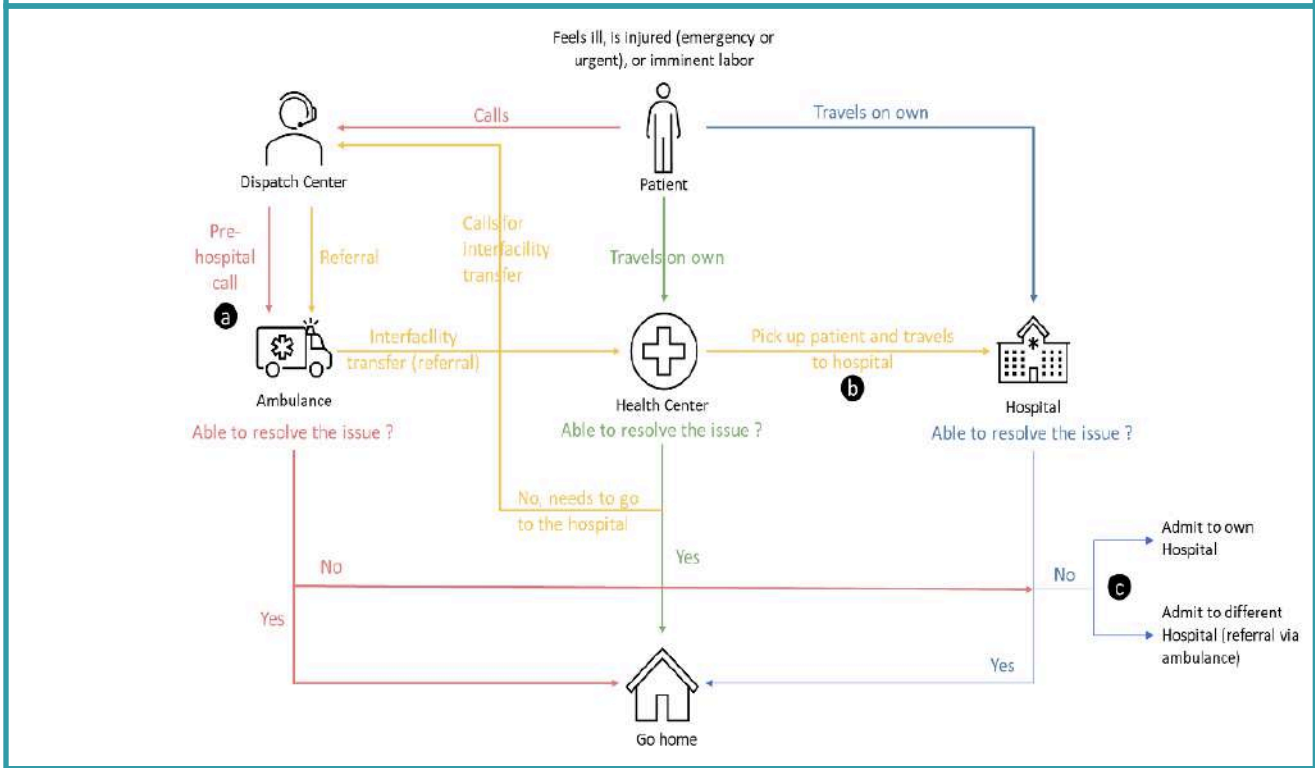


# IV. How PECS can potentially address the Burden of Disease

Well-functioning PECS systems offer real potential to address the increasing burden of disease. Over the past 25 years or so, significant efforts have been made to reduce maternal mortality and morbidity as well as infant and child mortality in low- and middle-income countries. Many of these efforts utilized vertical programs that focused on specific diseases or conditions and were well suited to the gains achieved. However, broad-based gains in addressing the burden of disease that can be tackled by PECS will require greater attention to comprehensive emergency systems, as opposed to a vertical focus on, say, trauma care or emergency obstetrical care.[15] This means that highly functional systems are needed, with an emphasis on rapid response, care coordination and referral networks, and the consistent application to high quality treatment guidelines or protocols.

As Calvello et al. suggests "Integration

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[15] Calvello, E.J., et al, "Applying the lessons of maternal mortality reduction to global emergency health", Bulletin of the World Health Organization, 2015;93:417-423. doi: http://dx.doi.org/10.2471/BLT.14.146571

of emergency services has the potential to improve outcomes with fixed resource inputs by improving both organization of services and efficiency of service delivery."[16]

The largest contribution of PECS in terms of Disability Adjusted Life Years (DALYs), which is the sum of years of life lost (YLL) and years lived with disability (YLD)[17], is the prospect for mortality reduction, with YLL representing 91% of the total potential DALY impact. For low- and middle-income countries (LMICs) this would be primarily in the areas of improved survival from RTA, other trauma, heart attacks, strokes, and obstetrical emergencies.

The African Federation of Emergency Medicine has identified six sentinel emergency conditions that, if properly disseminated, could assist the public in making more informed decisions to seek immediate care[18]. These sentinel conditions include respiratory failure (difficulty breathing), stroke, general altered mental state, general severe pain, general trauma, and dangerous fever. An integrated approach to emergency response must therefore acknowledge that cost-effective measures also prioritize transport to hospitals, emergency department diagnosis and resuscitation, and the transfer and coordination of definitive care. This is particularly salient when aiming to reduce the burden of road traffic accidents (RTAs) that require referral to a higher level of care.

It has been suggested by Calvello et al (2015) that the "three-delay model", which has been used to effectively highlight the key factors affecting maternal outcomes could be similarly applied to PECS (see Figure 3)[19].



Figure 3 - The three-delay model in emergency care
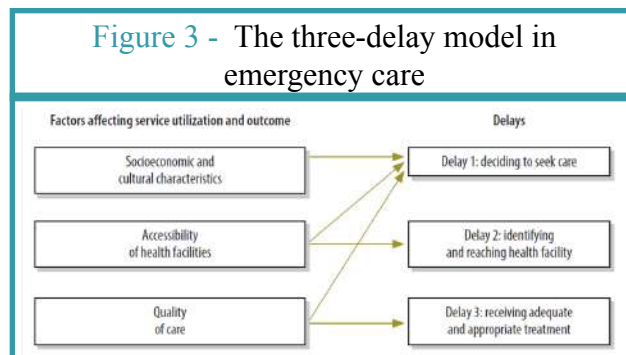
In the first delay, there are issues related to when the patient, caregiver or other person recognizes that there is in fact an emergency situation, the perceived quality of care that will be provided and the cost of accessing care, although it is postulated that when the situation is perceived as a true emergency, this may be less of a consideration.

Delays in identifying and reaching a health facility can be mitigated by a well-functioning pre-hospital care system that can bring care to the patient in advance of getting to a facility, with the presence of first responders that can further reduce the delay to providing initial care. There are also potential delays in getting from the scene of the incident to the facility, which can be mitigated by well-functioning transport services and which will require both good coordination and the materials and supplies (including fuel) necessary to transport the patient.

Finally, in terms of the third delay, Calvello states that:

"The delay in the receipt of appropriate care – after the patient has reached a health facility – may be broken down into three parts: the delay in the provision of appropriate care at the initial facility,

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[16] Calvello EJB, Broccoli M, Risko N, Theodosis C, Totten VY, Radeos MS, et al. "Emergency care and health systems: consensus-based recommendations and future research priorities." Acad Emerg Med. 2013 Dec;20(12):1278–88. http://dx.doi.org/10.1111/acem.12266 pmid: 24341583, p. 1278.

[17] Refer to the Glossary for the definitions of DALYs, YLL and YLDs.

[18] Reynolds TA et al. AFEM consensus conference 2013 summary: Emergency care in Africa – Where are we now? Afr J Emerg Med(2014),http://dx.doi.org/10.1016/j.afjem.2014.07.004, p. 160.

[19] Op. cit., p. 418.

the delay in the patient's transfer to another facility for definitive care – if needed, and the delay in the provision of appropriate care at the second facility – if needed. Delay at any of these time points has been shown to worsen patient outcome. For cases of sepsis, for example, rapid triage at a health-care facility and early therapy – which should be possible even in low-resource settings – can reduce mortality substantially."[20]

According to World Health Organization (WHO)[21], RTAs are currently the 9th leading cause of death globally and the 10th leading cause in SSA, resulting in 1.442 million deaths per year worldwide in 2015 and 243,000 in SSA. WHO estimates that by 2030 the number of RTA deaths will increase by 30% to 1.85 million, making it the 7th leading cause of death globally. Unfortunately, the death rate for RTA in SSA is 25% higher than the global average in 2015 (25 versus 20 per 100,000 population), but this is expected to increase significantly to 72% higher by 2030 (38 versus 22 per 100,000). For SSA, the challenge is even more pressing, with an estimate that RTA's could double to 514,000 annually, making RTAs the 6th leading cause in SSA. This would mean that in 2030, RTAs would be responsible for more deaths in SSA that either pre-term birth complications or malaria (ranked 7th and 8th, respectively). Figure 4 below shows the expected shifts in the top 20 causes of death between 2015 and 2030, both globally and for SSA.

SSA represents the largest group of countries (by population) without effective PECS systems. A well-functioning PECS system could also positively affect the outcomes for other leading causes of death, including heart attacks (a large proportion of Ischemic Heart Disease – #1 globally and #7 in SSA in 2015 and #1 and #4

respectively in 2030) and stroke (#2 globally and #4 in SSA in 2015, and expected to be #2 and #3 respectively in 2030). Some of the key causes of death which might be affected by well-functioning PECS systems are highlighted in pink (ischemic heart disease, stroke, road injury, pre-term birth complications, etc.), including the shifts in those causes, which are marked by arrows.

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[20] Op. cit., p. 419.
[21] WHO Projections of Mortality and Causes of Death, 2015-2030 (web-site): http://www.who.int/healthinfo/global_burden_disease/projections/en/

Figure 4 -  Estimated Deaths by Cause, 2015 and 2030

**World**

**2015**

| Rank | GHE code | Cause | Deaths (000s) | Deaths per 100,000 population |
|---|---|---|---|---|
| 1 | 113 | Ischaemic heart disease | 7594 | 105 |
| 2 | 114 | Stroke | 6700 | 92 |
| 3 | 39 | Lower respiratory infections | 3223 | 44 |
| 4 | 118 | Chronic obstructive pulmonary disease | 3217 | 44 |
| 5 | 11 | Diarrhoeal diseases | 1808 | 25 |
| 6 | 10 | HIV/AIDS | 1667 | 23 |
| 7 | 68 | Trachea, bronchus, lung cancers | 1636 | 23 |
| 8 | 80 | Diabetes mellitus | 1556 | 21 |
| 9 | 153 | Road injury | 1423 | 20 |
| 10 | 112 | Hypertensive heart disease | 1137 | 16 |
| 11 | 50 | Preterm birth complications | 1133 | 16 |
| 12 | 123 | Cirrhosis of the liver | 1028 | 14 |
| 13 | 3 | Tuberculosis | 887 | 12 |
| 14 | 127 | Kidney diseases | 871 | 12 |
| 15 | 161 | Self-harm | 836 | 12 |
| 16 | 66 | Liver cancer | 825 | 11 |
| 17 | 64 | Stomach cancer | 797 | 11 |
| 18 | 51 | Birth asphyxia and birth trauma | 768 | 11 |
| 19 | 65 | Colon and rectum cancers | 751 | 10 |
| 20 | 155 | Falls | 714 | 10 |

**2030**

| Rank | GHE code | Cause | Deaths (000s) | Deaths per 100,000 population |
|---|---|---|---|---|
| 1 | 113 | Ischaemic heart disease | 9245 | 112 |
| 2 | 114 | Stroke | 8578 | 104 |
| 3 | 118 | Chronic obstructive pulmonary disease | 4568 | 55 |
| 4 | 39 | Lower respiratory infections | 3535 | 43 |
| 5 | 80 | Diabetes mellitus | 2464 | 30 |
| 6 | 68 | Trachea, bronchus, lung cancers | 2413 | 29 |
| 7 | 153 | Road injury | 1854 | 22 |
| 8 | 10 | HIV/AIDS | 1793 | 22 |
| 9 | 11 | Diarrhoeal diseases | 1617 | 20 |
| 10 | 112 | Hypertensive heart disease | 1457 | 18 |
| 11 | 123 | Cirrhosis of the liver | 1201 | 14 |
| 12 | 66 | Liver cancer | 1186 | 14 |
| 13 | 127 | Kidney diseases | 1152 | 14 |
| 14 | 64 | Stomach cancer | 1143 | 14 |
| 15 | 65 | Colon and rectum cancers | 1075 | 13 |
| 16 | 161 | Self-harm | 1007 | 12 |
| 17 | 155 | Falls | 976 | 12 |
| 18 | 95 | Alzheimer's disease and other dementias | 966 | 12 |
| 19 | 50 | Preterm birth complications | 917 | 11 |
| 20 | 70 | Breast cancer | 805 | 10 |

**Sub-Saharan Africa**   (low-and-middle-income countries)

**2015**

| Rank | GHE code | Cause | Deaths (000s) | Deaths per 100,000 population |
|---|---|---|---|---|
| 1 | 39 | Lower respiratory infections | 1200 | 124 |
| 2 | 10 | HIV/AIDS | 1148 | 119 |
| 3 | 11 | Diarrhoeal diseases | 743 | 77 |
| 4 | 114 | Stroke | 518 | 54 |
| 5 | 50 | Preterm birth complications | 460 | 48 |
| 6 | 22 | Malaria | 402 | 42 |
| 7 | 113 | Ischaemic heart disease | 354 | 37 |
| 8 | 51 | Birth asphyxia and birth trauma | 353 | 37 |
| 9 | 55 | Protein-energy malnutrition | 346 | 36 |
| 10 | 153 | Road injury | 243 | 25 |
| 11 | 3 | Tuberculosis | 239 | 25 |
| 12 | 17 | Meningitis | 235 | 24 |
| 13 | 80 | Diabetes mellitus | 209 | 22 |
| 14 | 140 | Congenital anomalies | 187 | 19 |
| 15 | 81 | Endocrine, blood, immune disorders | 168 | 17 |
| 16 | 42 | Maternal conditions | 163 | 17 |
| 17 | 123 | Cirrhosis of the liver | 156 | 16 |
| 18 | 52 | Neonatal sepsis and infections | 151 | 16 |
| 19 | 162 | Interpersonal violence | 137 | 14 |
| 20 | 156 | Fire, heat and hot substances | 119 | 12 |

**2030**

| Rank | GHE code | Cause | Deaths (000s) | Deaths per 100,000 population |
|---|---|---|---|---|
| 1 | 10 | HIV/AIDS | 1318 | 98 |
| 2 | 39 | Lower respiratory infections | 1233 | 91 |
| 3 | 114 | Stroke | 867 | 64 |
| 4 | 113 | Ischaemic heart disease | 606 | 45 |
| 5 | 11 | Diarrhoeal diseases | 590 | 44 |
| 6 | 153 | Road injury | 514 | 38 |
| 7 | 50 | Preterm birth complications | 473 | 35 |
| 8 | 22 | Malaria | 427 | 32 |
| 9 | 80 | Diabetes mellitus | 398 | 29 |
| 10 | 51 | Birth asphyxia and birth trauma | 364 | 27 |
| 11 | 55 | Protein-energy malnutrition | 293 | 22 |
| 12 | 3 | Tuberculosis | 246 | 18 |
| 13 | 140 | Congenital anomalies | 219 | 16 |
| 14 | 81 | Endocrine, blood, immune disorders | 215 | 16 |
| 15 | 123 | Cirrhosis of the liver | 200 | 15 |
| 16 | 17 | Meningitis | 184 | 14 |
| 17 | 118 | Chronic obstructive pulmonary disease | 163 | 12 |
| 18 | 112 | Hypertensive heart disease | 160 | 12 |
| 19 | 52 | Neonatal sepsis and infections | 155 | 11 |
| 20 | 162 | Interpersonal violence | 151 | 11 |

Another important consideration is the fact that several the causes of death amenable to PECS intervention are especially prevalent in the younger adult age groups.  As shown in Figure 5 below, three of the top 5 causes of death globally in 2015 could potentially be reduced through a well-functioning PECS system.   Road traffic accidents are the leading cause of death for this age group, accounting for 13.1% of all deaths overall and 18.3% of deaths in males aged 15-29, the leading cause of death for this cohort. These percentages are expected to increase by 2030 to 18.5% and 21.7% respectively.  Deaths from injuries due to interpersonal violence are

also an important factor for males in this age group, while maternal conditions are the second leading cause of death for females aged 15-29.

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**Figure 5 -**  Causes of death in young adults

### Global Causes of Death Ages 15-29



Percent of Total Deaths

Legend: ■ Road injury  ■ HIV/AIDS  ■ Interpersonal violence  ■ Diarrhoea  ■ Maternal conditions

Categories: 2015 Male, 2030 Male, 2015 Female, 2030 Female, 2015 Total, 2030 Total

### Sub-Saharan Africa Causes of Death Ages 15-29



Percent of Total Deaths

Legend: ■ Road injury  ■ HIV/AIDS  ■ Interpersonal violence  ■ Diarrhoea  ■ Maternal conditions

Categories: 2015 Male, 2030 Male, 2015 Female, 2030 Female, 2015 Total, 2030 Total

*Source:  WHO Projections of mortality and causes of death, 2015 and 2030* [22]

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[22] https://www.who.int/healthinfo/global_burden_disease/projections2015_2030/en/

Within SSA, the percentage of deaths from HIV/AIDS, diarrhea and maternal conditions are much more prevalent, while the proportion of deaths from RTAs and interpersonal violence are much lower. However, while proportion of deaths due the first 3 conditions are expected to decline, deaths due to RTAs are expected to increase sharply, from 7.1 to 12.8 percent of all deaths and from 10.1 to 16.1 percent of male deaths for the 15-29 age group.

The evidence base regarding the potential impact of PECS is still emerging, but several estimates of the impact exist. This impact will be examined in terms of four common conditions likely to be positively affected by a well-functioning PECS service: trauma and road traffic accidents, maternal and neonatal conditions, cardiac arrest and stroke.

# IV. 1 Trauma and Road Traffic Accidents

Road traffic injuries constitute a major health and development challenge; a main contributing factor being the absence of proper road safety management and intervention measures. Looking at high-income country examples, there are multiple studies that highlight the impact of improved trauma systems in developed countries. One from Australia indicated that adjusting for key predictors of mortality, there was a statistically significant overall reduction of 38 percent between 2001–02 and 2005–06 in the risk of death for patients treated in the trauma system. Where road trauma and head injury cases were analyzed separately, there were 44 percent and 38 percent reduced likelihood of death, respectively.[24]

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**Box 4 - Secretariat of WHO on Emergency Care Systems for the 120th session of the Executive Board**

"Studies on the effect of improving organization and planning of trauma care in high-income countries have consistently shown survival gains of between 8% and 50%; ... Strengthening trauma and emergency-care services could have an important public health benefit. Even under the conservative assumption of reducing mortality among all injured patients by only 8%, an estimated 400 000 lives could be saved each year".[17]

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[23] WHO Executive Board. Report by the Secretariat, Health Systems, Emergency Care Systems, EB120/27, January 8, 2007

[24] Cameron, P.A., et al. A statewide system of trauma care in Victoria: effect on patient survival, Medical Journal of Australia, Volume 189 Number 10, 17 November 2008, pp. 546-550.

Another study from the United States concluded that states with trauma systems had a 9 percent fewer crude injury mortality rate than those without. When motor vehicle crash (MVC) related mortality was evaluated separately, there was a 17 percent reduction in deaths, which dropped to 9 percent after controlling for age, speed laws, seat belt laws, and population distribution.[25]

More recently, a county-level analysis of MVC death rates showed that counties with a level I or II trauma center had a 35 percent lower mortality rate than counties that did not[26]. Also, of note in the same study – which included over 2200 counties and over 2 million EMS responses – it was concluded that lower average pre-hospital response times in a county was positively correlated with MVC mortality rates in that county. Counties with average response times of 7 minutes or less had MVC mortality rates of 4.9 per 100,000 population on average, while those with response times of over 12 minutes had mortality rates of 11.9 per 100,000.

Similar evidence is emerging from LMICs. A landmark study of pre-hospital trauma care in Cambodia and Iraq showed reductions in the fatality rate in the respective study populations of 40 to 15 percent during the five year-study period compared to the pre-intervention level. Following the establishment of a "chain of survival"-rescue system, a gradual and significant decrease in mortality was observed each year.

The paramedics who gained most hands-on trauma

experience had better results than colleagues with less experience; there were 158 fatalities (14.9%), which is a significant reduction in trauma mortality compared with the pre-intervention level at 40 percent (95% CI for difference 17.2–33%). There was a significant reduction in trauma mortality by year during the study period from 23.9 percent in 1997 to 8.8 percent in 2001 (7.8–22.4%).[27]

Another LMIC study looked at preventable trauma deaths in a large teaching hospital in Kumasi, a city of 1 million people in Western Ghana. Using a methodology developed by WHO, the researchers established panels to look at medical charts to determine if trauma deaths were preventable. Of the 231 trauma deaths recorded over the 5-month period covered by the study, enough data existed to conduct the review for 84 cases. Of these cases, 23 percent were determined to be "definitely preventable" and another 37 percent were "probably preventable". Pre-hospital delays, delays in treatment and inadequate fluid resuscitation were determined to be the most common deficiencies.[28] This study suggests that improvements in the functioning of existing PECS systems (both pre-hospital and in-hospital) can also lead to significant benefits in terms of reduced mortality, and by extrapolation, morbidity.

[25] Nathens A.B., et al, Effectiveness of state trauma systems in reducing injury-related mortality: a national evaluation, J Trauma. 2000 Jan; 48(1):25-30.

[26] Byrne, James P., et al., Association Between Emergency Medical Service Response Time and Motor Vehicle Crash Mortality in the United States, JAMA Surg. 2019;154(4):286-293. doi:10.1001/jamasurg.2018.5097, February 6, 2019, p. E6.

[27] Husum, H., et al, Rural Prehospital Trauma Systems Improve Trauma Outcome in Low-Income Countries: A Prospective Study from North Iraq and Cambodia, The Journal of Trauma, Injury, Infection and Critical Care, June 2003, pp. 1188-1196. Citations p. 1193 and 1192.

[28] Yeboah, D., Mock, C., Karikart, P. Agyei-Baffour, P., Donkor, P., Ebel, B., Minimizing Preventable Trauma Deaths in a Limited-Resource Setting: A Test-Case of a Multidisciplinary Panel Review Approach at the Komfo Anokye Teaching Hospital in Ghana, World J Surg (2014) 38:1707–1712, DOI 10.1007/s00268-014-2452-z

# IV. 2 Trauma and Road Traffic Accidents

A detailed analysis of strategies for improved maternal survival was done in India in 2010. This study examined several potential packages of interventions and modeled the likely costs and benefits of each package. It also decomposed the package to estimate the impact of individual interventions on a stand-alone basis. This analysis estimated that the impact of improving emergency transport alone would reduce maternal mortality by 3.1% . Although this analysis was done to demonstrate the need for an integrated approach – since the overall mortality reduction of the complete package is in the 24% range – the 3.1% figure can be taken as the lower limit of potential improvement.

In a systematic review of maternal health interventions in resource limited countries, the intervention described as "strengthening the referral system and transport of patients" was the fourth most frequently cited (after training, improving drugs and supplies availability and improving infrastructure), and the most frequently cited intervention which support secondary prevention (defined as "preventing obstetric complications") . The study goes on to say that:

All programs which most successfully reduced maternal mortality and remarkable EmOC [emergency obstetrical care] indicators, had established functioning maternal health care systems with access to skilled birth attendants equipped with appropriate drugs, supplies and equipment and systems of referral to higher levels of care in the event of obstetric complications." (emphasis added).

Another study from the Free State province of South Africa found that maternal outcomes could be improved by improving ambulance response times . Both the average vehicle dispatch time and the proportion of calls dispatched within one hour were found to be significantly correlated (positively and negatively, respectively) with the maternal mortality ratio in the province.

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[29] Goldie SJ, Sweet S, Carvalho N, Natchu UCM, Hu D (2010) Alternative Strategies to Reduce Maternal Mortality in India: A Cost-Effectiveness Analysis. PLoS Med 7(4): e1000264. doi:10.1371/journal.pmed.1000264, p.12.
[30] Nyamtema, A., Urassa, D.P., van Roosmalen, J., "Maternal health interventions in resource limited countries: a systematic review of packages, impacts and factors for change", BMC Pregnancy and Childbirth, 2011, 11:30
[31] Ibid.
[32] Schoen, M.G., Impact of inter-facility transport on maternal mortality in the Free State Province, S Afr Med J 2013;103(8):534-537. DOI:10.7196/SAMJ.6828, http://www.samj.org.za/index.php/samj/article/view/6828/5286
[33] Babiarz, K.S., Mahadevan S.V., Divi, N. and Miller, G., Ambulance Service Associated With Reduced Probabilities Of Neonatal and Infant Mortality in Two Indian States, Health Affairs 35, no.10 (2016):1774-1782

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**Box 5 - Experience in India**

An October 2016 study[28] of the impact of PECS services on neonatal and infant mortality in two provinces (Gujarat and Andhra Pradesh, combined population 145 million), showed significant correlations between the availability of ambulance services and reductions in infant and neonatal mortality. In Andhra Pradesh, at the mean level of ambulance service intensity (ambulances per million people), the rates of neonatal and infant death declined by 7.5 and 10.6 per 1,000 live births. Higher numbers of ambulances per capita were associated with greater mortality declines. In Gujarat, the data did not show statistically significant gains overall, but it showed reductions of 4.5 and 4.7 neonatal and infant deaths per 1,000 live births in districts with above-average pre-intervention mortality rates. It also showed a reduction of 0.9 percent in maternal complications. It is important to note that the total number of ambulances per million people at the end of the study period was quite low by international standards (9.5 and 7.75 per million population on average in Andhra Pradesh and Gujarat respectively, compared to 20-40 per million in other developing countries with large regional or national PECS programs). This suggests that there may be scope for further impact with higher service intensity.

# IV. 3 Out-of-hospital Cardiac Arrest (OHCA)

Statistics from the American Heart Association indicates that of the roughly 424,000 cardiac arrests each year in the United States, only 5.2 percent survive. However, for those treated by the PECS system, the overall level of survival is 10.4 percent.[34] Another study based on registry data from both the United States and Canada indicated an overall survival rate of 5.5 percent in 2011, while 10.8 percent of those treated by PECS survived.[35]

Using data obtained on 5,375 patients from the Register of Information and Knowledge about

Swedish Heart Intensive Care Admissions (RIKS-HIA) between 1 January 2001 and 30 November 2004, the impact of pre-hospital thrombolysis (PHT) versus in-hospital treatment was analyzed. The study concluded that: "At 30 days, the crude mortality in the whole study population and at 1 year was 5.4 vs. 8.3% (P , 0.001) and 7.2 vs. 11.8% (P , 0.001) (OR 0.57, 0.46–0.73) in PHT and in-hospital-treated patients, respectively."[36] The study goes on to say that: "This nationwide registry of real-life patients shows that prehospital diagnosis and treatment are associated with

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[34] Heart Disease and Stroke Statistics—2014 Update, A Report from the American Heart Association, Circulation. 2014;128:00-00
[35] Current Burden of Cardiac Arrest in the United States: Report from the Resuscitation Outcomes Consortium
[36] Bjorklund, E., et al, "Pre-hospital thrombolysis delivered by paramedics is associated with reduced time delay and mortality in ambulance-transported real-life patients with ST-elevation myocardial infarction", European Heart Journal (2006) 27, 1146–1152

reduced time to thrombolysis by almost 1 h and reduced adjusted long-term mortality by 30%."[37]

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**Box 6 - A meta-analysis of studies on the impact of PHT showed a similar result**

" [...] prehospital thrombolysis for AMI significantly decreased all-cause hospital mortality based on a meta-analysis of 6 randomized controlled trials. Pooled data were insufficient to show a statistically significant difference in longer-term mortality at 1 or 2 years …   The results of the 6 randomized trials (n=6434) were pooled and indicated significantly decreased all-cause hospital mortality among patients treated with prehospital thrombolysis compared with in-hospital thrombolysis (odds ratio, 0.83; 95% confidence interval, 0.70-0.98)."[38]

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## IV. 4 Stroke

The mortality impact data with respect to stroke is less readily available.  However, in one study, patients who were treated by the PECS system showed 22 percent lower mortality (16.3 percent), compared to those who were not treated by PECS (20.9 percent, p=0.02).[39]

# V. Costs and potential benefits of PECS

## V.1 Costs

Data in developing countries on PECS system costs is not widely available, but the evidence base appears to be improving.  The DCP chapter on prehospital and emergency care cites system-level cost estimates by Kobusingye[40] in 2006 of between $0.79 to $2.15 per capita for staffed ambulances (as opposed to relying solely on volunteer first responders), with such a service in rural areas

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[37] Ibid, p. 1151.

[38] Morrison L.J., et al, "Mortality and Prehospital Thrombolysis for Acute Myocardial Infarction:  A Meta-analysis", JAMA. 2000;283(20):2686-2692.

[39] Kim, S. et al, Effect of Prehospital and emergency care services Use on Hospital Outcomes of Acute Hemorrhagic Stroke, Prehospital Emergency Care, 20:3, 324-332, p. 329 (2016)

[40] Kobusingye, O. C., A. A. Hyder, D. Bishai, M. Joshipura, E. R. Hicks, and others. 2006. "Prehospital and emergency care services." In Disease Control Priorities in Developing Countries, edited by D. T. Jamison, J. G. Bremen, A. R. Measham, G. Alleyne, M. Claeson, D. B. Evans, P. Jha, A. Mills, and P. Musgrove, 2nd ed. 1261–80. Washington, DC: World Bank and Oxford University Press.

costing up to three times as much. These estimates were based on one ambulance for each 30,000 people, or 33 ambulances per million population.

More recent data from the state of Madhya Pradesh (population 64.5 million) in India[41], present interesting results, although they occurred during a time when the ambulance service was expanding, so do not represent "steady state" costs. The relatively low service intensity in Madhya Pradesh (even at the end of the initial scale-up period, there were only 7.8 ambulances

per million population, similar to Andhra Pradesh and Gujarat in the Babiarz study), suggests that a range of costs based on service intensity might be useful. Based on the data from this study, the per capita costs (in US$) for various levels of service intensity were calculated and are shown in Table 1 below. Capital costs are annualized over a 5-year span, and these would be recurring following an initial scale-up since vehicles and equipment (the major categories of capital costs) must be regularly replaced and updated.

Table 1 - Per capita costs of PECS – India 2011 (US$)

| Service Intensity (ambulances/million) | Annual Operating | Annualized Capital | Total |
| --- | --- | --- | --- |
| 10 | 0.21 | 0.05 | 0.27 |
| 20 | 0.43 | 0.11 | 0.53 |
| 30 | 0.64 | 0.16 | 0.80 |

*Source: Author's calculations based on FHI/Deloitte report*

The composition between various categories of inputs is an important factor in determining the total cost. In this example, salaries comprised 55.2 percent of the total cost, while fuel, supplies, and other costs (including training and administration) took up 16.5, 12.8 and 15.5 percent respectively. A detailed costing, done in the context of a review of the prehospital and emergency care services system in Bulgaria,[42] found that over 2/3 of the total costs were taken up by salaries and related costs, with fuel being the next largest expenditure item followed by medical and other supplies.

Several projects are to develop PECS systems currently underway in SSA countries, including Tanzania and Malawi, which have initiated pilot programs, and Sierra Leone, which has developed a national EMS system. The country contexts are generally representative of SSA countries with Tanzania having ranked 21 out of 47 countries on the 2018 Human Development Index (0.53), Malawi ranking 31 (0.49), and Sierra Leone ranking 39 (0.44). The average for all countries (excluding Sudan) is 0.54. Data for the Sierra Leone example will be discussed in

[41] Family Health International – FHI 360 and Deloitte Touche Tohmatsu India Pvt. Ltd., "Assessment of Emergency Response Service (ERS) Performance in Madhya Pradesh", September 2013.
[42] World Bank, Bulgaria Health Financing RAS: Final Report on Health Financing Diagnostic and Review of Envisaged Reforms, Chapter 9: Emergency services package and reforms: Analysis of the proposed reform concept, May, 2015.

the case study below, but a preliminary costing that has been done to support the development of the pilot projects in Tanzania and Malawi.[43] This suggests an annualized operating and capital costs of $2.20 to $2.55 per capita, based on a service intensity of 1 ambulance for every 35,000 people on average (28.6 ambulances per million). While this is the average density, care would need to be taken to tailor the actual location of ambulances to the geography and population distribution, including special considerations for rural and "hard to reach" areas. The main reason for the difference in per capita costs is salaries, which account for 57 percent of the

total estimated operational costs in Tanzania and just 46 percent in Malawi, as well as staffing patterns and hours of work. These data suggest that cost estimates need to be country-specific to be useful for planning purposes. Table 2 recasts these estimates to show various levels of service intensity, so they are comparable to Table 1 above.

There are still significant differences in the costs, as shown in this table, and this may warrant further study. Nevertheless, as shall be seen in the next section, even with these cost estimates, a nation-wide PECS system is highly cost-effective.

Table 2 -  Estimated per capita costs of PECS – Tanzania and Malawi 2016 (US$)

| Country | Service Intensity (ambulances/million) | Annual Operating | Annualized Capital | Total |
|---------|--------------------|------------------|--------------------|-------|
| Malawi | 10 | 0.63 | 0.19 | 0.82 |
| | 20 | 1.21 | 0.35 | 1.56 |
| | 30 | 1.79 | 0.51 | 2.30 |
| Tanzania | 10 | 0.74 | 0.18 | 0.92 |
| | 20 | 1.45 | 0.34 | 1.79 |
| | 30 | 2.17 | 0.50 | 2.67 |

*Source:  Author's calculations*

# V.2 Potential Benefits

Using the burden of disease data for Tanzania and Malawi, as well as the conservative assumption of potential benefits based on the review of the literature in the previous section, it is possible to develop specific estimates of the benefits in terms of deaths and years of life lost avoided. This

can then be combined with the cost estimates to determine the overall cost-effectiveness of PECS for these countries. Similar estimates can be developed for other countries to assist in prioritizing investments in PECS.

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[43] Source:  Author's calculations, in support of Southern Africa Trade and Transport Facilitation Projects

Table 3 summarizes the burden of disease in four key areas:  ischemic heart disease, stroke, maternal and neonatal conditions and road traffic injuries.  These four areas are chosen since the available evidence on the potential benefits of PECS systems are the greatest.  While there are clearly other conditions (childhood illness and infectious diseases where a well-functioning PECS system should improve outcomes, the available evidence base is currently not specific enough to develop impact estimates.  This is

reinforced by the latest DCP edition, which suggests that there are a significantly greater number of diseases and conditions that could potentially benefit from PECS.  Since the marginal cost of interventions for such conditions is likely to be small, the estimates of potential net benefits are likely an underestimation of those that will probably be achieved, and the expected cost-effectiveness should therefore be much greater.

### Table 3 -  Burden of Disease – Malawi and Tanzania

| | | **Malawi** | **Tanzania** |
|---|---|---|---|
| | Estimated population ('000) | 17,215 | 53,470 |
| Estimated deaths | Ischemic heart disease | 5,986 | 19,082 |
| | Cerebrovascular disease | 5,080 | 17,195 |
| | Maternal/neonatal conditions | 15,639 | 43,985 |
| | Road traffic injuries | 5,884 | 17,840 |
| | Total | 32,589 | 98,102 |
| | Percent of all deaths | 21.2% | 23.6% |
| Estimated Years of Life Lost (YLL) | Ischemic heart disease | 137,951 | 487,246 |
| | Cerebrovascular disease | 119,345 | 451,803 |
| | Maternal/neonatal conditions | 1,346,593 | 3,734,159 |
| | Road traffic injuries | 363,357 | 1,075,318 |
| | Total | 1,967,247 | 5,748,527 |
| | Percent of all YLL | 23.6% | 25.3% |

*Source:  WHO Global Health Estimates, 2015*

Based on the review of the literature, conservative assumptions were made of the percent of deaths in each of these areas that might be avoided, and the average YLL per death used to convert these deaths into YLL avoided.  The potential gains, including the percent avoided, are shown in Table 4, below. This table provides a range of estimates, based on the degree to which the literature shows PECS systems can contribute to improved survival.

a. IHD – based on the US/Canada survival rate of 10.9 percent;
b. CVD (stroke) – based on 22 percent higher survival in the US with PECS;
c. Maternal/neonatal conditions – based on the modeled estimate of 3.1 percent for India; and,
d. Road traffic injuries (RTI) – based on the maximum WHO estimate for improved survival of RTIs with PECS (50 percent).

For IHD, CVD and RTAs, the levels selected as Low, Medium and High survival scenarios were 10, 20 and 30 percent respectively of the relevant reference survival rate, while for maternal/ neonatal conditions, the three levels were 2/3, 5/6 and 100 percent of the reference rate. These conservative assumptions are based on the lower overall level of health system performance in these developing countries, as well as the time it takes to implement overall health system improvements.

Table 4 - Potential Gains from PECS in Malawi and Tanzania[44]

| | Malawi | Low | Medium | High |
|---|---|---|---|---|
| Estimated | Ischemic heart disease | 65 | 130 | 195 |
| Deaths | Cerebrovascular disease | 111 | 223 | 335 |
| avoided | Maternal/neonatal conditions | 328 | 406 | 484 |
| | Road traffic injuries | 294 | 588 | 882 |
| | Total | 798 | 1,347 | 1,896 |
| YLL | Ischemic heart disease | 1,503 | 3,007 | 4,510 |
| Avoided | Cerebrovascular disease | 2,625 | 5,251 | 7,876 |
| | Maternal/neonatal conditions | 28,278 | 35,011 | 41,744 |
| | Road traffic injuries | 18,167 | 36,335 | 54,503 |
| | Total | 50,573 | 79,604 | 108,633 |
| | **Tanzania** | | | |
| Estimated | Ischemic heart disease | 207 | 415 | 623 |
| Deaths | Cerebrovascular disease | 378 | 756 | 1,134 |
| avoided | Maternal/neonatal conditions | 923 | 1,143 | 1,363 |
| | Road traffic injuries | 891 | 1,783 | 2,675 |
| | Total | 2,399 | 4,097 | 5,795 |
| YLL | Ischemic heart disease | 5,311 | 10,622 | 15,933 |
| Avoided | Cerebrovascular disease | 9,940 | 19,879 | 29,819 |
| | Maternal/neonatal conditions | 78,417 | 97,088 | 115,759 |
| | Road traffic injuries | 53,766 | 107,532 | 161,298 |
| | Total | 147,434 | 235,121 | 322,809 |

*Source: Author's calculations*

[44] Please refer to Annex 2 for the Calculation of Costs and Benefits of PECS.

According to WHO, an intervention that costs less than three times the national annual GDP per capita per DALY avoided is considered cost–effective, whereas one that costs less than once the national annual GDP per capita is considered highly cost–effective.[45] Table 5 below shows the cost-effectiveness calculation based on the Malawi and Tanzania data. It is based on the assumptions that there will be one ambulance for every 35,000 people on average, and that each ambulance will respond to 3,500 calls annually. This rate of 1:35,000 is the standard in Bulgaria and probably represents the upper end of what would be needed in the short and medium term. Specific standards would need to be developed on a country-specific basis, considering geography, desired response times and other factors. Nevertheless, using this standard will result in costs are likely to be higher than what would be seen in a national scale-up in a developing country context.

These assumptions suggest that 525 ambulances will be needed in Malawi and roughly three times as many in Tanzania and result in roughly 1.8 million calls in Malawi and over five million in Tanzania. Note that these would be the fully scaled up dimensions of both systems. Based on the cost estimates described above, the total annualized cost is expected to be just over $39 million in Malawi and $130 million in Tanzania, resulting in the per capita estimates of $2.21 and 2.55 respectively for the two countries. A key caveat, however, is to acknowledge that in many cases, in both urban and rural settings, ambulances will be restricted to a "rendezvous" role, as the quality of road network may hinder full geographic coverage. Alternatives to ambulance vehicles, such as motorcycle sidecar ambulances, have been shown to be effective in rural and remote areas

and could reduce both the number of ambulances and the resulting total cost.[46] Such considerations would come into play during the detailed system design and any eventual national scale-up.

The annualized cost represents between $361 and $775 per year of life lost avoided in Malawi and between $403 and $882 per YLL avoided in Tanzania. Compared to the PPP per capita GDP of $1,183 in Malawi and $2,667 in Tanzania, this gives ratios of the cost per YLL avoided to GDP per capita of 0.31-0.66 in Malawi and 0.15-0.33 in Tanzania, strongly suggesting that the intervention is highly cost-effective. Maternal and neonatal conditions account for between 24% and 41% of the potential deaths avoided (depending on country and scenario), but between 36% and 56% of total YLL avoided.

Extrapolating to all SSA, PECS systems could avert between 52,000 and 121,000 deaths and 3.3 to 6.7 million YLL annually at a cost of around $3.50 per capita (0.244% of GDP).

Obviously in developing an investment case, these ratios will have to be compared to the ratios of other interventions, but it is highly likely that these ratios will compare favorably to other options. Maternal and neonatal conditions account for between 24% and 41% of the potential deaths avoided (depending on country and scenario), but between 36% and 56% of total YLL avoided, suggesting that even if PECS was only developed to deal with maternity and neonatal emergencies, such a system would likely still be cost effective.

[45] Marseille, E., Larson, B., Kazi, D.S., Kahn, J.G., and Rosen S., Thresholds for the cost–effectiveness of interventions: alternative approaches, Bulletin of the World Health Organization 2015;93:118-124. doi: http://dx.doi.org/10.2471/BLT.14.138206
[46] See, for example: Hofman, J.J., Dzimadzi, C., Lungu, K., Ratsma, E.Y., and Hussein, J., Motorcycle ambulances for referral of obstetric emergencies in rural Malawi: Do they reduce delay and what do they cost?, International Journal of Gynecology and Obstetrics (2008) 102, 191–197.

Table 5 - Estimated Cost-effectiveness of Scaled-up Systems[47]

| | Malawi | Tanzania |
|---|---|---|
| Ambulances | 525 | 1,473 |
| Estimated Number of Calls | 1,837,500 | 5,155,500 |
| Average Cost/ call | $ 21.33 | $ 25.22 |
| Annualized annual cost | $ 39,191,785 | $ 130,031,798 |
| Annual cost/capita | $ 2.21 | $ 2.55 |
| Potential Years of Life Lost Avoided | | |
| Low estimate | 50,573 | 147,434 |
| Medium estimate | 79,604 | 235,121 |
| High estimate | 108,633 | 322,809 |
| | | |
| Cost/YLL avoided | | |
| Low estimate | $775 | $882 |
| Medium estimate | $492 | $553 |
| High estimate | $361 | $403 |
| | | |
| GDP/Capita PPP$ | $ 1,182.60 | $ 2,667.30 |
| Ratio -- Cost/YLL:GDP/capita | | |
| Low estimate | 0.66 | 0.33 |
| Medium estimate | 0.42 | 0.21 |
| High estimate | 0.31 | 0.15 |

*Source: Author's calculations*

Figure 6 graphically shows the estimated avoided YLL and the ratio of the cost per YLL to the GDP per capita for the different scenarios. The WHO threshold for highly cost-effective interventions is also shown.

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[47] Please refer to Annex 2 for the Calculation of Costs and Benefits of PECS.

Figure 6 - YLL and Cost per YLL by Scenario
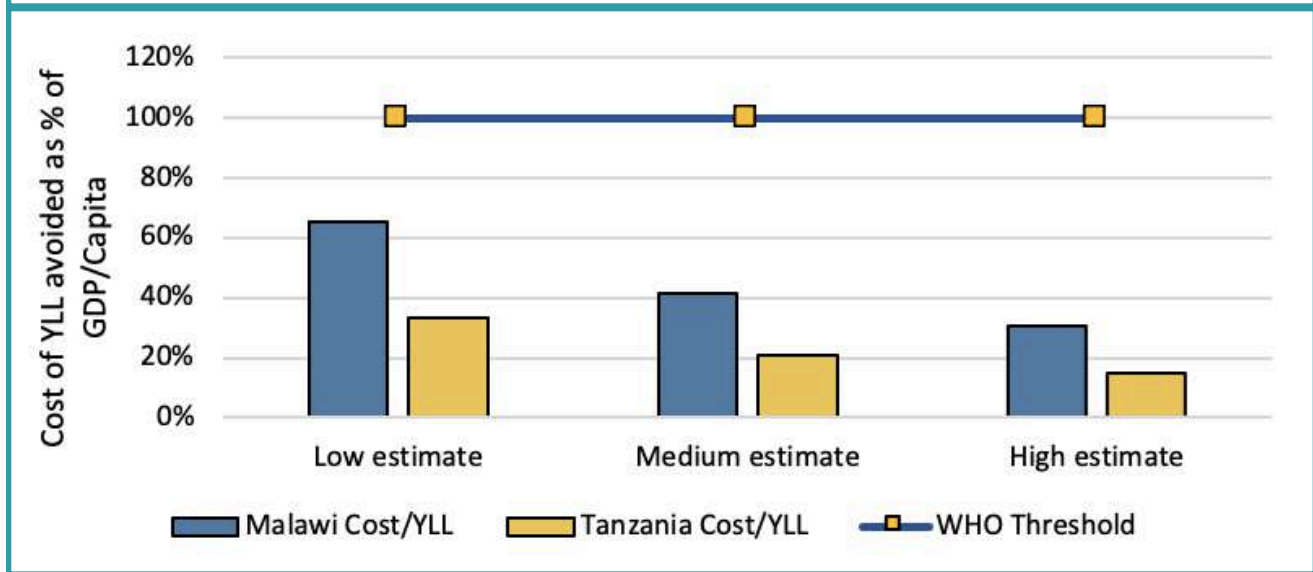
*Source: Author's calculations*

# V. Summary and Conclusion

The general absence of PECS systems in LMICs, together with the large, and growing, burden of disease that can be addressed by such systems suggest that further attention needs to be paid to establishing or improving PECS systems as part of the overall health system strengthening process. This Chapter has shown (a) that there is a growing evidence base on the effectiveness of PECS interventions; (b) that the costs of scaled up national systems are within the reach of even low income countries; and, (c) that – according to WHO criteria – such interventions are highly cost effective. As such, investments in PECS systems should be considered as "best buys" when developing national health system investment plans.

In addition to averting deaths, well-functioning PECS systems also help to reduce the morbidity associated with injuries as well as maternal, neonatal and obstetrical emergencies. Aside from the human and emotional suffering, premature death and disability can also have a devastating impact on a family's economic circumstances, especially when income-earners are involved. Reducing this death and disability can help improve the resilience of families and communities to the shocks of injuries and other emergencies.

Further, well-functioning PECS systems are critical investments in providing an effective emergency preparedness and response capability, and as such are important elements of a disaster risk reduction strategy. They can also serve as an effective frontline public health messaging mechanism to disseminate government health education and outreach campaigns, as well as deter poor health practices in the community – for example, drunk driving, seatbelt usage, handwashing, COVID19 mitigation, Ebola, cholera, etc. Having multiple

teams of well-trained medical staff capable of handling emergency situations (including both pre-hospital and in-hospital environments), will enhance a country's ability to respond to disasters and to concentrate the available resources where and when they are needed.

The next several chapters of this study focus on various aspects of the EMS (pre-hospital) system based on an in-depth survey of the current state of EMS system development.

Chapter 2 reviews of the various **EMS Governance and Standards,** with sections related to EMS governance – including legislation and governance arrangements, interagency arrangements, the current state of EMS in each country, provider authorization, standards and inspection and vehicle standards – followed by EMS standards – including EMS delivery planning and standards and EMS dispatch – and EMS human and other resources.

Chapter 3 looks closer into **EMS Financing Arrangements** across SSA, including policy frameworks, funding allocation, provider payments and insurance schemes.

A comprehensive review of the regional standards and approaches being used for **EMS Training** is presented in Chapter 4, including a review of the overall organization of EMS training and the specific approaches used in various SSA countries for the training of physicians, nurses, other EMS professionals, and first responders. The EMS professional practice authorizing environment as well as the financing of EMS training are also reviewed.

Chapter 5 completes the review of the survey results by reporting on the current state of **EMS Communication Standards**, with a focus on the arrangements for public access to EMS services, EMS dispatch and control, interagency communications and EMS services and medical control communications related to EMS.

Chapter 6 of this report sets out core aspects in the **Design Considerations of EMS Systems**, including cases studies on piloting, development and scale-up for EMS systems in both SSA and elsewhere, as well as two case studies on improvement of EMS systems in partnership with the World Bank.

Finally, Chapter 7 brings the various parts of the report together by focusing on **Implementation: Issues and Opportunities.** The chapter concludes with a discussion of the opportunities for harmonization of EMS standards between countries in SSA as well as a summary of general conclusions and considerations for comprehensively developing EMS systems and services.

**Country Profiles** have been included as an Annex to the report that present a snapshot of each participating country's individual responses to the EMS survey work, highlighting potential gaps that deserve more focused attention.

# CHAPTER 2
# EMS Governance and Standards
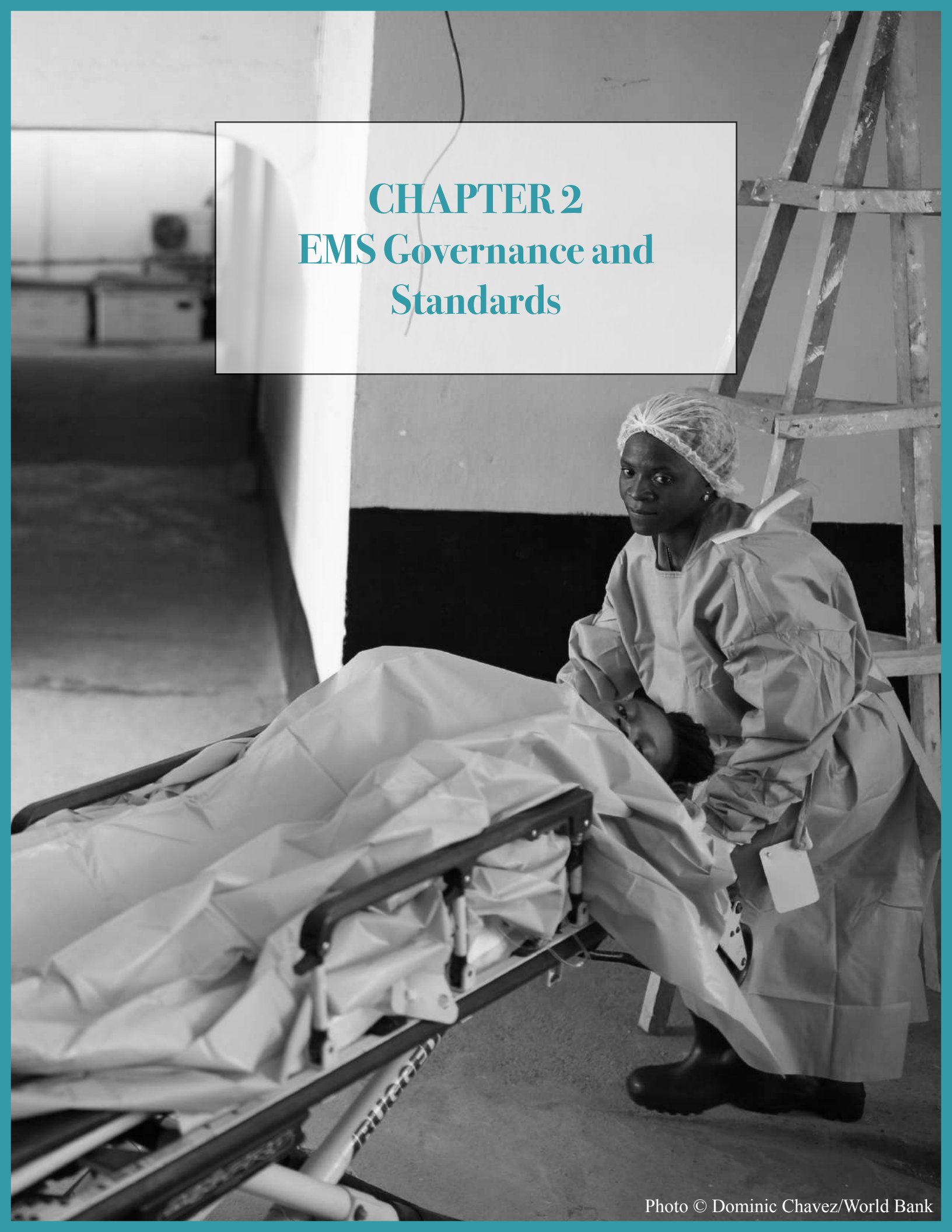
# CHAPTER 2: EMS Governance and Standards

## I. Introduction

The following chapter highlights the relevance and importance that EMS system regulations and standards as they relate to proper policy development of recommendations across SSA countries However, the chapter does not consider the advantages and disadvantages of EMS models adopted by SSA various countries, does not take a position on whether regulatory approaches should be applied, nor does it measure the success or failure in applying the various EMS policies in the implementation of EMS standards. Additionally, the chapter provides a summary of the regulations and standards in three key areas of the EMS systems: governance, care delivery, and human resources and other pertinent issues. The chapter provides an analysis that is exclusively from questionnaire data provided by the National Respondents (NRs). Missing data and discrepancies triggered a detailed review of laws and other regulatory acts, policy and planning documents, charters and statutes, official websites, reports and other materials.

## II. EMS Governance

### II.1 EMS Terminology Framework across SSA countries

There is an international consensus on the definitions of Emergency Medicine to advance care toward a more cohesive and coordinated future.[48,49,50] The practice of Emergency Medicine includes organizing the proper medical response for patients looking for urgent medical care. Emergency Medicine is not defined by location but may be practiced in a variety of settings including hospital-based and freestanding emergency departments, urgent care clinics, medical observation units, emergency medical response vehicles at disaster sites or via telemedicine.

This chapter provides an organized approach to analyze the variety of EMS systems that have been developed across SSA. A better understanding of each dimension of the existing systems emphasizes

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[48] Please refer to Annex 2 for the Calculation of Costs and Benefits of PECS.
 International Federation for Emergency Medicine (IFEM) definition of emergency medicine. https://www.ifem.cc/about-us/
[49] European Society for Emergency Medicine (EUSEM) definition of emergency medicine, Updated 2017. https://eusem.org/news/87-updated-definition-of-emergency-medicine-in-europe
[50] American College of Emergency Physicians (ACEP) definition of emergency medicine, Revised 2015. https://www.acep.org/globalassets/new-pdfs/policy-statements/definition-of-emergency-medicine.pdf

the need to use consensus definitions for essential terminology of emergency care, as well as the way in which these are considered within the regulatory framework. Consequently, the following umbrella terminology  has been adopted for this report:

a. **Out-of-Hospital Emergency Care (OHEC)** – the full spectrum of emergency care that occurs outside healthcare facilities. This broadly includes care delivered by both laypersons and professional responders.

b. **Pre-hospital Care** – out-of-hospital emergency care delivered by a professional provider with the ability to provide transport to a healthcare facility. This includes all the key elements of OHEC, namely bystander-initiated care, easy access to emergency care services, provision of medical care by trained prehospital practitioners, and emergency transportation to the closest, most suitable formal healthcare facility

c. **Emergency Medical Services** – formalized prehospital care, provided by emergency care professionals who respond to medical emergencies within a well-defined jurisdiction. EMS refers to an established entity, agency or system, which is appropriately integrated into the existing OHEC and facility-based healthcare system, thereby facilitating the coordinated, timely, and safe provision of emergency care and transportation to the most appropriate healthcare facility.

Two main models of EMS services have emerged in many countries using location/environment of care (i.e. pre-hospital vs. in-hospital). However, there are differences in EMS terminology around the world.[52] The reviews of emergency care in LMICs conclude that public policy lacks a sound evidence base and has been founded on an incomplete understanding of the issues.[53,54]

In fact, the analysis confirms that the terms "out-of-hospital emergency care," "pre-hospital" and "emergency medical services" are used interchangeably and sometimes erroneously. The majority of SSA countries, as reported by NRs, do not regulate the term "emergency medical services" and there is a pattern to not include the pre-hospital setting and processes in general health care regulations. Nevertheless, twelve SSA countries included EMS terminology into the legislative or secondary regulatory framework (i.e. MoH regulations, licensing and/or accreditation standards, clinical guidelines/protocols, pre-service or in-serve training curriculum); three of which have primary legislative provisions that are distinct (Burkina Faso, Senegal and Cameroon) (Figure 7: EMS terminology in regulatory frameworks). Burkina Faso, by the Order of the Ministry of Health[55], defines a "medical emergency" as a situation of human experience that requires immediate or rapid medical intervention without which the vital or functional prognosis could be affected; location of the medical care provided is not included in its definition. However, in Senegal and Cameroon, the term "emergency medical services" is interpreted as the service of transporting, by use of an EMS vehicle, of a person to a hospital or other place to receive medical care. A service that provides on-site pre-hospital care but does

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[52] Toloo S., FitzGerald G., Aitken P., Ting J., Tippett V., Chu K. Emergency Health Services: Demand and Service Delivery Models. Monograph 1: Literature Review and Activity Trends. 2011, Queensland University of Technology.

[53] Obermeyer Z. et al. Emergency care in 59 low- and middle-income countries: a systematic review. Bull World Health Organ 2015; 93:577–586G http://dx.doi.org/10.2471/BLT.14.148338

[54] Kobusingye O. et al. Emergency medical systems in low- and middle-income countries: recommendations for action. Bulletin of the World Health Organization. August 2005, 83 (8)

[55] Arrêt n° 2011 du Ministère de la Sante portant définition, organisation et fonctionnement des soins d'urgence

not transport the patient to a hospital or other place to receive medical care is not providing an emergency medical service in these two countries. Moreover, the legislative provisions in Senegal and Cameroon constitute medical transportation as the key or essential part of EMS and treats patient transportation as a separate component of EMS for public and private operators.

While efforts were made to identify existing definitions of "essential service" across SSA countries, there is no authoritative legal or policy definition of an essential service across SSA countries. Upon review of EMS-related documentation presented by NRs and available on the official websites, as well as based on two complementary statements – ensuring public safety and equal access, the review did not identify countries where the regulatory framework makes suggestive reference to EMS as an "essential service".

Figure 7 - EMS terminology considered within the regulatory framework



EMS terminology considered within the regulatory framework

- Primary legislation (Laws, Government Decrees and/or Ministerial Orders
- Delegated legislation in the field of licensing and/or accreditation, clinical guidelines/protocols, pre-service or in-serve training
- Lack of standard definitions for EMS terminology
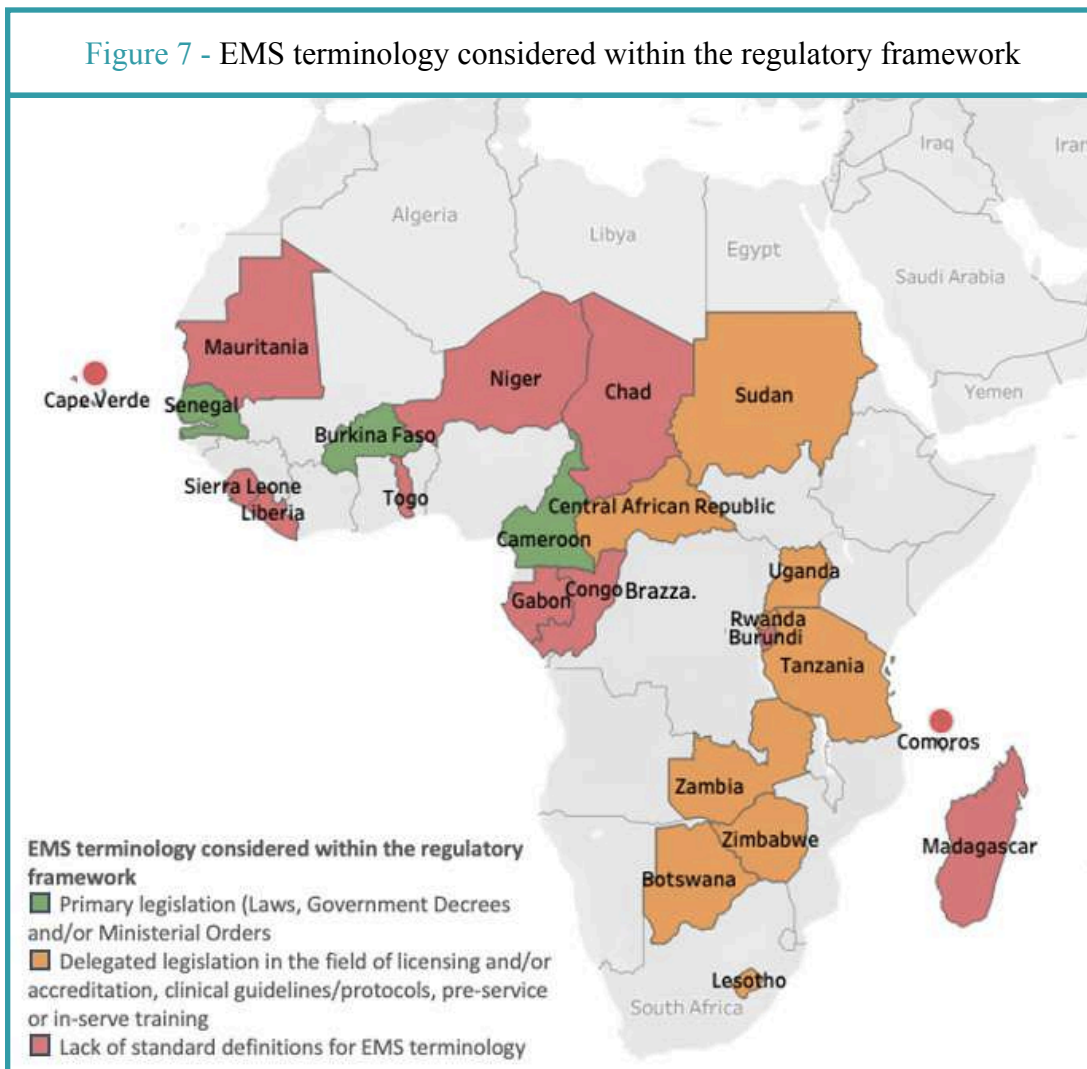
## II.2 Legislation related to the EMS system

The constitutional right of access to health care in SSA countries is underpinned by national laws and regulations, but in most instances, this right is limited by the availability of state resources and is subject to progressive realization. The majority of SSA countries establish the right to receive healthcare for every citizen in their constitutions and/or organic laws in the field of healthcare, as reported by NRs (Figure 8: Right to healthcare across SSA countries). In a wider context, this provides the equity-based justification for government provision of emergency medical care. Despite the expressed articulation of this right, most countries' current legal frameworks are focused heavily on illustrating the responsible institutional mandates for public service delivery, including EMS system regulations, but without fully appreciating the full context and meaning to the right of access to health care.

Figure 8 - Right to healthcare across SSA countries



Right to healthcare across SSA countries
☐ The right to care enshrined by Constitution or organic laws in the field of healthcare
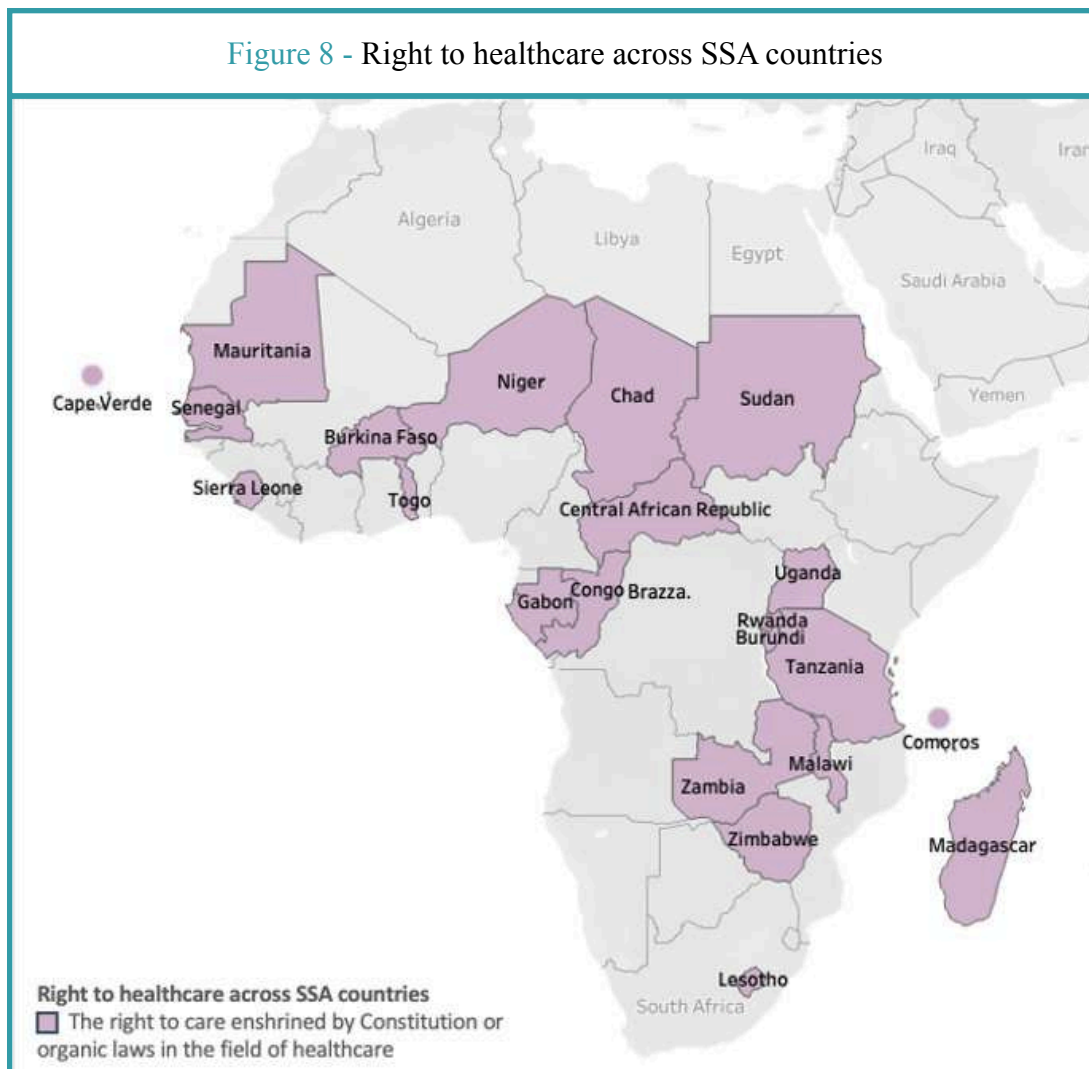
Information provided by the NRs reveal the paucity of legislation relating specifically to EMS system in SSA countries under review (Figure 9: Level of legal regulation of the EMS system). Most countries surveyed do not have specific EMS regulations in place.[56] There were some countries that included it in general healthcare law (Zimbabwe and Zambia), while others had a government decree or MOH Order (Burkina Faso, Lesotho, Rwanda, Uganda, Cameroon, Madagascar).There is one notable exception, Senegal,  which is the only country surveyed that had a special law on EMS.  Other countries within the region could use Senegal as a benchmark to measure existing legislation and models for future legislation. It is also important to note, however, that the lack of specific legislation in most countries does not reflect a lack of country capacity to provide EMS. In several cases, the authority to organize and operate EMS is implicit in other legislation (e.g., legislation on crisis and disaster response in Burundi and non-healthcare legislation in Uganda), which is usually related to wider public safety, and there is evidence that this authority is being exercised. Moreover, it is not necessarily surprising that the regulatory process has not further evolved given that it is neither required nor a traditional practice that such records be enacted in primary or delegated legislation. EMS guidelines, procedures, protocols, standards and related documentation represent a core source of regulation provisions in a majority of SSA countries, and therefore represent a key area where harmonization could be pursued.

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[56] Botswana, Cabo Verde, Central African Republic, Chad, Comoros, Congo Brazzaville, Gabon, Liberia, Mauritania, Niger, Togo, Sudan, Sierra Leone

Figure 9 - Level of legal regulations of the EMS system
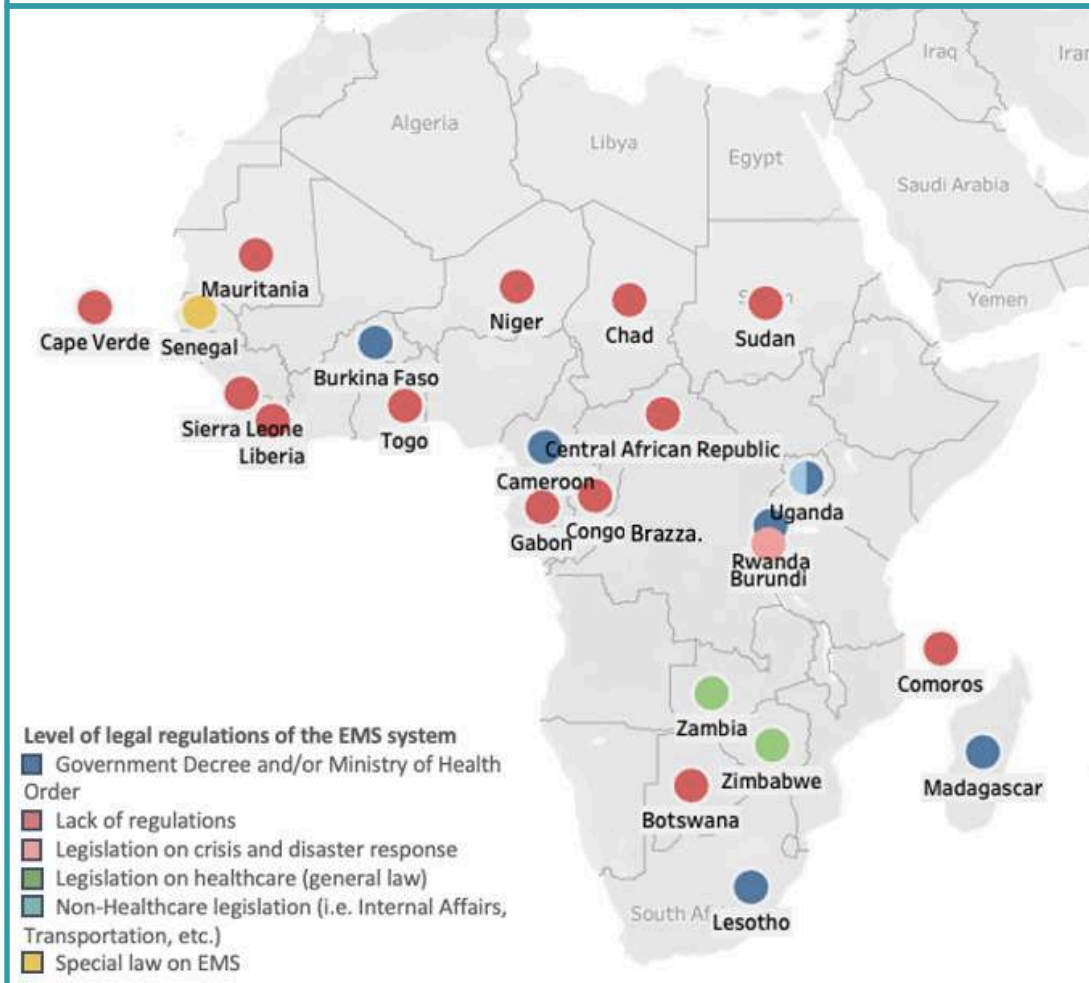


Figure 10 - Distribution of the EMS system's level of legal regulations in the respondent countries
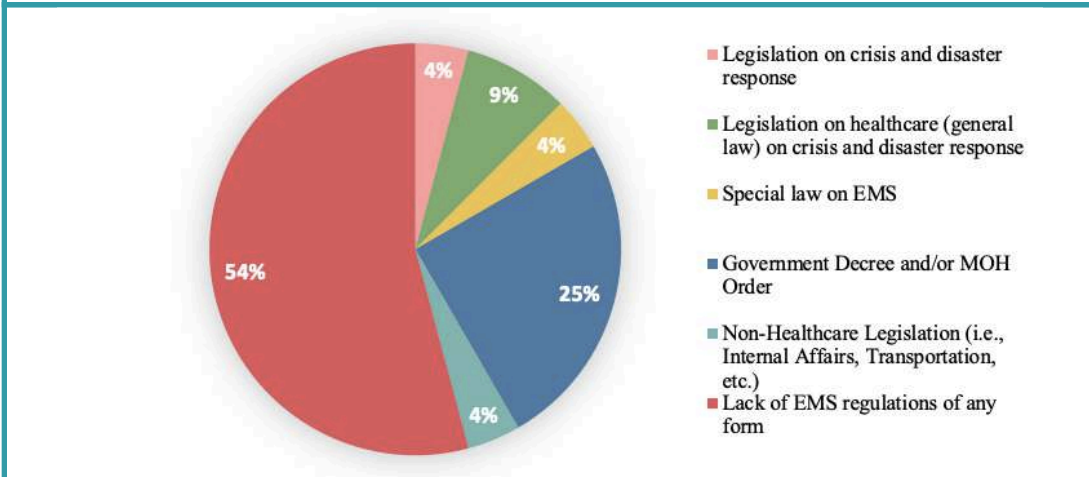
# II.3 Legislation related to the EMS system

Despite the advances made in regulating EMS in several SSA countries, sizable challenges in the area of governance remain. The legal provisions on EMS governance, particularly at the national level, are inconsistent and fragmented. EMS systems in SSA countries are scattered across multiple organizations and models even in countries that have organic and quite comprehensive set of rules and laws that embody the organization and structure of EMS system (e.g. Senegal). For instance, many countries[57] use multiple model/approaches to organize and regulate pre-hospital emergency care, while others[58] only have a national system in place (see country profiles in Annex 4 for more details). A few countries (Liberia, Togo, Zambia, and Zimbabwe) use hybrid systems, while Sudan is the only country surveyed that uses a private system. It was difficult to determine from the information reported by the NRs how the EMS systems are organized and functioning (i.e. leadership and organizational structure), as well as which mechanisms and the degree of integration within the health system and other appropriate stakeholders within government. It is unclear how.

Responsibility for all aspects of the EMS system in many SSA countries is dispersed among different national and local authorities or other governing bodies (see country profiles in Annex 4).[59] For the majority of SSA countries, the Ministry of Health was reported as being the authority responsible for EMS policy development. However, it often does not act as a lead agency responsible and accountable for all aspects of EMS (see box below).

Cameroon provides a noteworthy example of how to reshape the leadership and management of EMS Systems. In 2018, Cameroon reorganized the EMS system by establishing the Emergency Medical Care Service as a functional service. At the national level, it instituted a National Coordination Committee responsible for EMCS leadership and implementation of the policy on prehospital public and private services. At the regional level, the EMCS includes EMS operational units based in the framework of regional inpatient facilities. The EMCS relays are constituted of all the other public and private EMS providers in the catchment area, as well as of their pool of ambulances.

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[57] Botswana, Burundi, Cameroon, Comoros, Lesotho, Senegal, Sierra Leone, and Uganda

[58] Burkina Faso, Cabo Verde, Congo-Brazzaville, Gabon, Madagascar, Malawi, Niger, Rwanda, and Tanzania

[59] The NRs did not indicate that these EMS systems are governed through a collaboration of administrations supported by a regulatory framework. There were no expressed legal responsibilities for Government to establish the procedure for cooperation in EMS between the health sector, rescue service agencies (e.g. fire service) and police authorities.

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**Box 7 - Example of Typical Management and Leadership
of EMS system in SSA**

In Zambia, the MOH aims to ensure that every household is within 5 km from a public health facility and can receive emergency medical care and as such is ultimately responsible for improving the EMS and communications systems to facilitate coordinated response to emergencies. Yet the country has not designated a lead national agency responsible and accountable for comprehensive EMS system management, including regulatory development, regulatory oversight, organization of the system and financing.

In Madagascar, where the Center for Pre-Hospital Emergency Medical Care is in the process of being established under the Ministry of Public Health the expectation of a formal lead agency is promoted through public policy choices.

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In countries with specific legislation related to EMS, a more formal organization of the system is found. The EMS Division is a structure of the Rwandan Ministry of Health responsible for overseeing all inter-facility and pre-hospital interventions. In 2005, Senegal instituted a law establishing the Emergency Medical Care Service as a public institution - subordinated technically to the Ministry of Health and financially to the Ministry of Economics and Finance -- having the authority to implement the EMS system.[60,61] Senegal's EMCS is coordinated hierarchically by the National Council for Emergency Medical Care and Medical Transportation chaired by the Minister of Health. Further, Senegal's EMS legislation establishes the Board of Directors and the Director as the governing bodies of the public institution. In some countries, a lack of uniformity in a national governance approach is reflective of perceptions that EMS is simply a public safety or transportation service, and not exclusively a medical service. Conversely, in Burkina Faso, Chad and Mauritania, emergency care is recognized as only hospital-based, excluding formal pre-hospital care. EMS Governance arrangement vary substantially in SSA. Typically, the MOH takes the lead in the management of EMS systems. However, coordination with other entities is critical in their success. In some instances, hospitals coordinate with the police and firefighters to provide additional support. In other instances, police and firefighters provide pre-hospital care, while the MOH takes the lead in the hospital-based care. Private entities are also part of the EMS governance arrangements in certain countries and are incentivized according to response times. Examples of other EMS governing bodies, such as the Red Crescent and Red Cross, are reflected in Table 6.

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[60] Loi n° 2005-22, du 5 août 2005, relative à l'assistance médicale d'urgence et aux transports sanitaires. http://samu.sn/textes_legislatifs/relative_a_l_assistance.pdf
[61] Décret n° 2005-1271, du 29 décembre 2005, portant organisation administrative et financière du service d'assistance médicale d'urgence (SAMU). http://samu.sn/textes_legislatifs/Decret_2005-1271_du_29_decembre_2005_portant_organisation_administrative.pdf

Table 6 - Other EMS governing bodies at national and/or regional/local level

| EMS Governing Body | Countries |
|---|---|
| Motor Vehicle Accident Fund | Botswana |
| Local authorities | Botswana<br>Uganda<br>Cameroon<br>Sierra Leone |
| Civil Protection Authority | Congo Brazzaville<br>Lesotho<br>Togo |
| Health Professionals Authority | Zimbabwe<br>Zambia |
| Fire Service (under MoIA) | Congo Brazzaville<br>Madagascar<br>Botswana |
| Red Cross and Red Crescent Movement | Lesotho<br>Liberia<br>Central African Republic<br>Cameroon |
| Hospitals | Liberia |
| Private Operators | Togo |
| PPPH Unit | Uganda |
| Police (under MoIA) | Uganda<br>Cameroon<br>Sudan |
| Ministry of Defense | Cameron<br>Sudan |

Botswana has private entities that provide pre-hospital care under an agreement with Botswana's Motor Vehicle Accident Fund. They are paid if they respond to the emergency needs within the golden hour.[62] Some countries ensure cross-agency coordination and collaboration in

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[62] The golden hour is the period of time following a traumatic injury that a patient has to receive medical care and treatment to prevent death. It is usually defined as an hour, but it depends on the nature of the injury.

their governance structures such as in Uganda, Senegal, Lesotho, and Zambia. Uganda's approach includes the Ugandan Police Force, which has three directorates (Directorate of Police Health Services, Directorate of Fire Prevention and Rescue Service, and Directorate of Traffic and Road Safety, which are all mandated to provide emergency medical services (see box below). Senegal represents a notable example of intersectoral cooperation whereby the Emergency Medical Care Service has the legal responsibility to join the Fire Service when the situation requires

joint medical-public safety interventions. In Lesotho, the coordination is evidenced between the community, police, paramedics, medical and nursing staff in response to emergency. Similarly, in Zambia, the planning and coordination of the response to certain categories of emergencies is done in an integrated manner with other line ministries and agencies, including Police, Fire Service, Road Transport and Safety Agency. If the incident exceeds the health sector's capacities, the Disaster Management and Mitigation Unit under the Vice President's office is activated.

# II.4 Interagency Collaboration for EMS provision

Generally, provision of EMS faces several special challenges related to weak legal frameworks on how delineating sectoral responsibility for EMS functions (i.e. Fire Service, Police, Ministry of Defense, etc.), as well as across multi-jurisdictional scenarios. First and foremost, these agencies do not impose standards or requirements on EMS. Second, many EMS system problems are magnified in situations where the jurisdictional lines are crossed in absence of corresponding level regulations on interagency collaboration (i.e. an Order of the Ministry of Health on EMS system does not have legal power on EMS interventions realized by MoIA, MoD, etc. and their agencies).

Though the design of the questionnaire makes it difficult to obtain a clear and comparable legal framework on EMS integration within national health systems and other coordinating entities across SSA countries, the analysis of different aspects of the EMS systems for which regulations have been enacted highlight an apparent homogeneity across SSA countries. First and foremost, the EMS systems are partially integrated within countries' healthcare system, except in countries with a formal EMS system in place (i.e. Senegal, Rwanda, Cameroon, etc.).

This situation is also rooted in the structural organization of the health systems themselves. In Zambia, at a policy level, all health facilities must provide accident and emergency services. Thus, EMS is part of the continuum of healthcare; resource mobilization, including health personnel, ambulances and consumables, is executed by health facilities in response to all emergencies. Nevertheless, this might not be a cause per se of major obstacle to ensuring a full integration within the health system. Second, the EMS system integration within crisis/disaster response system is better supported at legislative/regulatory levels compared to the health system in SSA countries.

In most SSA countries, the Ministries of Health or EMS agencies are not the lead authorities tasked with crisis management/disaster response (see Table 7), nor are the EMS system responsibilities explicitly stipulated during such major incidences. The Central African Republic, Niger and Sierra Leone are the only countries that have reported the Ministry of Health as the leading authority in crisis management/disaster response. Others include the Civil Protection Authority, Ministries of Emergency Management, Disaster Management Units, among others. This is rooted

by inconsistent governance models in place and fragmented approaches to organize and regulate EMS systems. While the other key stakeholders in crisis management and disaster response (police, fire service, military, etc.) usually have well-defined and standardized positions within the government organization – although there

may be variations, say, between anglophone and francophone countries – the lack of standardized structures and/or governance models in EMS between countries, as well as fewer national-level EMS services, means that EMS is less likely to play a leading role in crisis/disaster response, or to even have a clearly defined role.

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**Box 8 - Ugandan Police Force and Emergency Medical Services**

As part of Uganda's Ministry of Internal Affairs, police are constitutionally mandated to protect and serve the people of Uganda and therefore, includes a Directorate of Police Health Services under the Ugandan Police Force. This Directorate has the responsibility among other health education and promotion activities to provide the Emergency Medical Services with police officers acting as first responders. Other directorates under the Ugandan Police Force that provide emergency medical services are the Directorate of Fire Prevention and Rescue Services, which provides fire services and emergency response and the Directorate of Traffic and Road Safety, which provides emergency response/first aid on the roads.

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There are several countries with notable examples of the various ways EMS is integrated in crisis management and response. Some countries such as Rwanda have an EMS Division as part of disaster contingency plans (i.e. earthquake, floods and landslides, drought, terrorist incidents) to ensure that necessary EMS resources are readily mobilized.[63] This includes the EMS Division Manager as the health system representative in the National Disaster Management Committee. Other countries such as in Uganda, the EMS system is part of the National Disaster Preparedness and Management Committee in the framework of the Office of the Prime Minister (as of October 2018). The National Policy on Disaster Preparedness and

Management stipulates the MoH responsibilities during disasters (e.g. development of an integrated approach to health-related disasters) but does not explicitly define the role of EMS system. Thus, the Ministry of Health has a well-developed response system for epidemics, but reduced capacities to manage emergencies in mass road traffic accidents, landslides and mass gatherings.

Some countries, such as in Senegal and Zambia, explicitly mention of the role of EMS during emergencies. Senegal's Emergency Medical Care Service, according to legal provisions, is involved in the implementation of the ORSEC (Emergency Response) Plan. Zambia's EMS

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[63] Prime Minister's Order No 98/03 of 17/07/2018 on Organization and Functioning of Disaster Management Organs. Official Gazette of Rwanda No. Special of 18/07/2018.

system has the responsibility in the field of activation and chain of command, coordination of the response, escalation, resource mobilization and review of the response during a crisis.

The Government of Cabo Verde, where there is no clear mandate for disaster risk management in the country, started to move from a traditional responsive approach for disasters towards a more proactive and holistic disaster risk management approach. However, the legal and institutional framework and capacity for implementation and sustainability remain important constraints.

# II.5 Current State of EMS system across SSA countries

Most SSA countries have informal EMS systems with some gradually evolving into formal systems, mainly as a result of macro-level governance interventions, according to which a central authority is mandated with policy development and organization of pre-hospital care (see Figure 11: Type of EMS system by SSA country). Additionally, the few formal EMS systems that were identified as such by NRs are self-classified as incomplete systems, due to reduced capacity to ensure pre-hospital care to all patients at any given time. Formal EMS systems preserve the characteristics of informal rudimentary systems due to lack of continuity of governance interventions at meso- and micro-level (i.e. emergency incidents should be handled at the lowest jurisdictional level possible). Congo Brazzaville provides an example of the national level EMS systems in place, but the lack of management at the local levels. The establishment of a national EMS system is stipulated in the NHDP 2018-2022, and the Ministry of Health (i.e. General Direction of Healthcare) is responsible for organizing the emergency care both at pre-hospital and in-hospital levels. In fact, the Civil Protection Authority already has an emergency service equipped with ambulances and trained personnel, as well as the Ministry of Health which has several ambulances deployed exclusively for national and international events and in case of disasters. However, it is unclear of the processes for incidences or crisis that do not occur at a national or regional scale.

Figure 11 - Type of EMS system by SSA country[64]



Type of EMS system by SSA country
- Formal universal EMS system
- Formal incomplete EMS system
- Informal EMS system (rudimentary)
- Informal EMS system (no pre-hospital care)
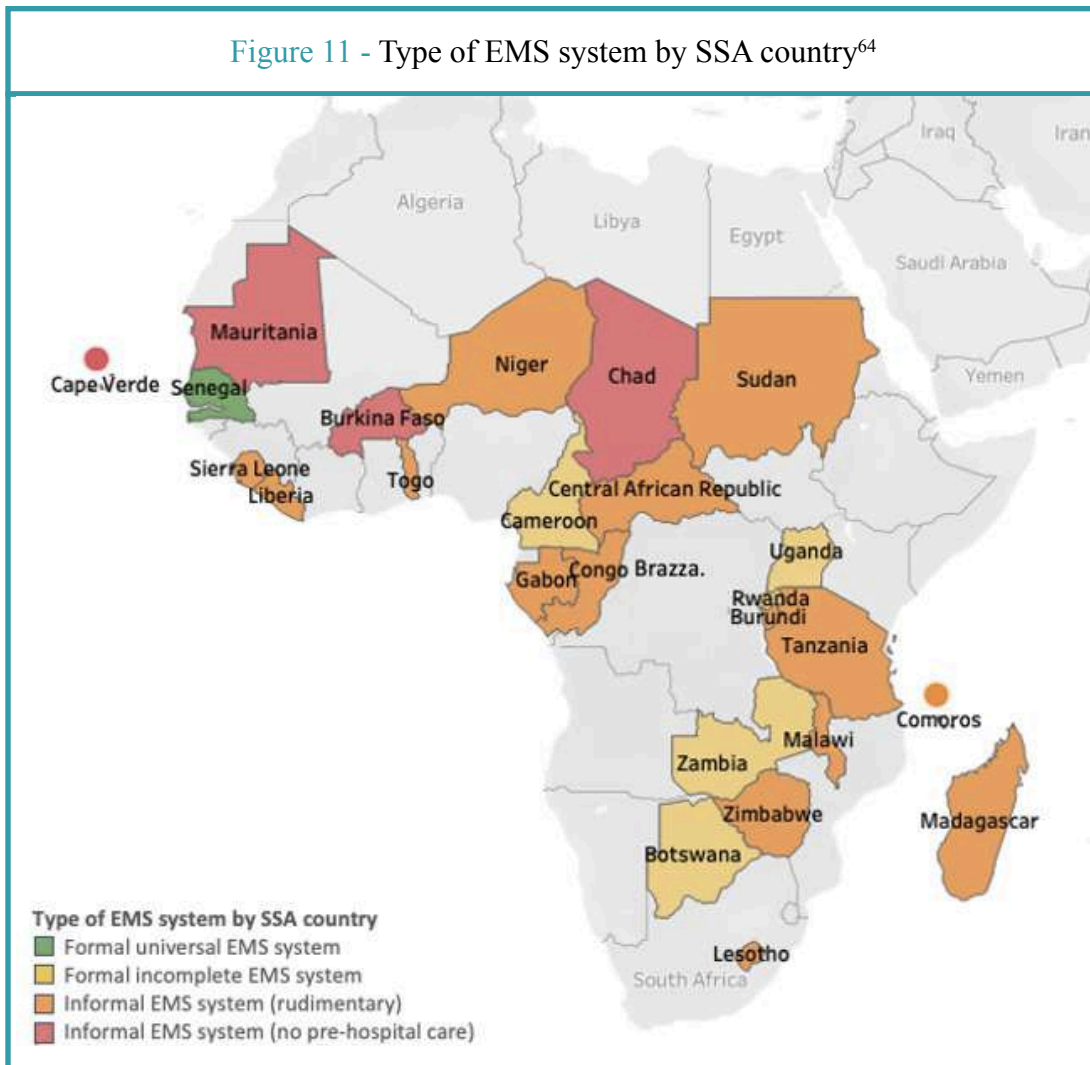
The survey results offer a deeper look at how OHEC provided by first responders at a community level through the prism of "systems approach". Here, the majority of SSA countries report that First Responder Care (FRC) exists (see Country Profiles Annex 4 for more information), though several other countries may offer limited to small-scale projects and/or reduced number of communities, rather than a full level of care. Thus, FRC may not be considered as a formal tier-one within the EMS system due to lack of a policy framework that establishes a large-scale, administratively and financially integrated community response program.

The analysis of FRC-related policy frameworks did not identify a comprehensive set of responsibilities of the governing bodies for

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[64] **Formal EMS System** = central authority is mandated with policy development and organization of pre-hospital care;
**Formal, Incomplete EMS System** = partially integrated in countries' healthcare systems but incomplete because they lack the capacity to ensure pre-hospital care for all patients;
**Informal EMS Systems (rudimentary approaches)** = no clear lead and inability to decentralize the system to lower level jurisdictions;
**Informal EMS (no pre-hospital care)** = no system in place to ensure pre-hospital care.

overseeing and supporting the programs with their own resources, infrastructure and connections, as well as an FRC management/operationalization structure responsible for both professional and community levels. Lead state EMS authority – Ministry of Health – remained the governing body in most SSA countries, but with varying degrees of authority and funding compared to the second-tier of EMS systems. FRC programs led by MoH and/or Communities do not integrally reproduce the standards in the field. In addition to these concerns, there are concerns about (i) the tools used for estimating the number of FRs needed; (ii) training standards and re-training; and (iii) dispatch and operations on scene, including supplies and equipment for this level of care.

FRC arrangements vary across SSA countries. Rwanda, for example, chose to maintain an active role of health personnel in delivering FRC. The community health workers are the first responders, and in some cases Red Cross volunteers act as FR in the community. In Uganda, FRC includes the community health workers, community leaders, taxi drivers, volunteers and the police. The coverage is however still low in the country, mainly in Kampala city and, partially, in the Masaka region. Most schools in Cameroon have designated a teacher responsible for providing first aid to students before sending

them to the hospitals. Also, friends and passersby provide OHEC for a considerable proportion of patients. Nevertheless, the community health workers represent the main source of FRs.

The diversity of FRC approaches can be viewed as a strength since programs are tailored to the needs and capabilities of communities. Conversely, it presents a profound weakness in cases where there is no difference in type and volume of emergency first aid provided by the two complementary groups – basic first-aid providers and advanced first-aid providers (i.e. community health worker, Red Cross or Red Crescent volunteer, etc.). Alternatively, the advanced first-aid providers may not be exclusively focused on FRC provision; they are more likely to manage the rest of FRs and their operations in the community, as well as training and retraining according to the identified needs.

The regulations are examined more closely in the next paragraphs, in order to highlight whether the respective provisions reflect the standards and requirements related to EMS providers. The chapter concludes that, in the majority of SSA countries, the legislation does not stipulate specific conditions for a company, sole proprietor, non-for-profit NGO or a state and local Government agency to perform EMS as health activity.

# II.6 EMS Provider Authorization

EMS Provider Authorization is critical to ensure providers have the right skillset to perform treatment and care. The SSA countries with informal EMS systems have an unregulated and open purvey, thus anyone can adopt a title or claim to be able to provide pre-hospital care without any formal authorization or complying with the minimum standards for EMS. These

countries include: Burkina Faso, Cabo Verde, Central African Republic, Chad, Liberia, Madagascar, Mauritania, Tanzania, and Togo.

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**Box 9 - Private Provider Example: Togo**

In Togo, a private organization – Togo Assistance, provides pre-hospital care and has contracts with hospitals. Togo Assistance was established, according to civil legislation, and recorded in the Commercial Register, to accomplish relief and transport of injured and victims of accidents.

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On the other hand, formal EMS systems more often succeeded with ensuring legislation remained current, updating or amending requirements aimed at strengthening EMS practices. Generally, the establishment of the EMS provider is linked to the regulations on the establishment of healthcare facilities issued by the Ministry of Health, and which are common for both public and private organizations. In Congo Brazzaville, for example, the conditions are the same for public and private healthcare facilities. The decision is issued by the Ministry of Health based on the resolution of the Technical Commission.

Two distinct approaches for establishing and authorizing the EMS providers are evidenced in SSA countries with formal EMS systems. First, after being legally organized according to the civil legislation, the EMS provider is required to meet regulations/conditions specific to the operation of the emergency medical service. The second approach are public institutions or functional services that assign the management and care terms.

In Botswana, EMS providers are licensed by the Health Services Office by satisfying the requirements set by the National EMS Quality Standards developed by the Health Inspectorate of the Ministry of Health. This Quality Assessment Tool used to license providers sets EMS standards in the fields of management and leadership; human resources; administration

support; access to service; patients' rights; management of information; risk management; patient care; facility, equipment and vehicle management. Comoros is the only country surveyed which (partially) regulates the process of EMS provider authorization by covering the following issues – authorization requirements, application for authorization, processing of application, issuance of authorization, denial of authorization and renewal of authorization. The EMS provider authorization is realized by the Health General Inspection according to Health Code provisions (see Table 7). In Sudan, the EMS provider can be set up by the Ministry of Health, the Ministry of Internal Affairs (i.e. Police) and the Ministry of Defense.

In SSA countries with a developed regulatory and institutional framework in the field of health practitioner authorities (i.e. boards, councils, etc.) – Zimbabwe, Zambia, etc., the registration and/or licensing of EMS providers is attributed by law to previously mentioned authorities. A public or a private EMS provider is registered based on a positive inspection report (e.g. Zimbabwe – local authority Health Department inspection). The registration and renewal procedures are based on meeting requirements established by Minimum Standards for EMS providers (ambulances) which covers reception, call room, vehicles, and service area. However, the authors conclude that procedures related

to registration, renewal, inspection, shortfalls, and closure are not comprehensive and do not integrally reflect the international standards.

Table 7 - Agency responsible for authorizing the EMS provider

| Agency | Countries |
| --- | --- |
| Health Service Office (MoH) | Botswana |
| Health Professionals Authority | Zimbabwe |
| | Zambia |
| Department of Health General Inspection (MoH) | Burundi |
| Health General Inspection | Comoros |
| Emergency Medical Care Service | Senegal |
| Ministry of Health | Congo Brazzaville |
| | Lesotho |
| | Sudan |
| | Uganda |
| | Cameroon |
| | Malawi |
| Council (of Licensing) | Rwanda |
| Ministry of Internal Affairs (Police) | Sudan |
| Ministry of Defense | Sudan |

A second approach is evidenced in countries with a centralized EMS model –Senegal and Cameroon. By instituting the Emergency Medical Care Service as a public institution (Senegal) and functional service (Cameroon), the state assigns the management and care terms according to which EMS shall be provided. However, these terms are mostly normative judgments, rather than standards in EMS.

In Senegal, the law stipulates that (i) any person carrying out a sanitary transportation must have been previously authorized by the administrative authority; (ii) the authorization to carry out a medical transportation is issued exclusively based on the technical evaluation and cannot be transferred to third parties; (iii) authorized transportation providers are subject to periodic control. The following  are established by the

Ministry of Health: (i) categories of means of transport to be assigned to medical transportation; (ii) categories of persons authorized to carry out medical transportation, their qualifications and responsibilities, as well as the composition of crews; (iii) procedures for issuing and revocation of authorization to carry out transportation by private operators. Senegal is one of the few SSA countries which established a system of penalties,

including criminal provisions, for unauthorized provision of sanitary transportation. Thus, anyone who has carried out a sanitary transportation without authorization or in case of withdrawal of authorization shall be punished by a fine of 200,000 to 2,000,000 XOF (US$350-US$3,500) or imprisonment from 6 months to 2 years. In case of recidivism, the penalty is doubled.

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### Box 10 - Cameroon's Experience with Private EMS Providers

Cameroon's Ministry of Health has designed regulations on private EMS providers' authorization. A private provider is not entitled to establish and operate medical transportation without an authorization of the Ministry of Health in one or both of the following categories – (i) medical transportation within the framework of the public emergency medical care service, and (ii) medical transportation by private organizations or ambulances of private health care facilities. The application for authorization includes – (i) prescribed form accompanied by the required supporting documents; (ii) report on technical evaluation carried out by the Medical Coordinator of the territorially competent Call and Emergency Control Center; (iii) list of the personnel and their qualifications; (iv) copy of drivers' licenses and of recycling certificates; (v) employment contracts of the personnel. The application for authorization must be transmitted by the Regional Delegate for Public Health, with his/her prior notice. Furthermore, the regulatory framework is limited in provisions regarding the inspection of new applicants, processing of application, decision on authorization, issuance of authorization, suspension or cancellation of authorization, appeal, renewal of authorization, etc.

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The Cameroon Emergency Medical Care Service, through its National Coordination Committee, processes applications for approval and ensures the control of public and private medical transports, in accordance with the standards established by the regulations in force. At the same time, the EMCS Cameroon is responsible for the development of pre-hospital care standards and their implementation across medical

transportation providers. However, private EMS providers have different requirements and cannot establish or operate medical transportation without the Ministry of Health's authorization.

The issues discussed above allow one to conclude that, in regulating the EMS systems across SSA countries, the Ministries of Health are placed in the difficult position of being regulator, EMS

service provider and authorizing agency. This triple role can create internal conflicts. For example, the Ministries of Health (under the pressure of resource constraints) are responsible for both assuring an adequate number of public EMS providers and authorizing activity against standards and requirements. For this reason, many NRs reported that public EMS providers that are founded by health ministries are not necessarily performing in line with standards.

# II.7 EMS Provider Standards

The survey analysis logically concludes that the policy framework related to EMS provider standards in many SSA countries are limited. The operational standards and requirements for the EMS provider are poorly implemented through delegated legislation even in SSA countries that stipulate compulsory service conditions in primary legislation (see Table 8). Similarly, it is reasonable to conclude that the standards and requirements used by SSA countries are not defined according to generally accepted EMS standards and performance metrics to evaluate the efficacy of system standards.

Several countries report that the implementation of EMS provider availability standards (Burundi, Congo Brazzaville, Lesotho, Niger, Rwanda and Senegal), whereby authorized EMS providers shall make ambulance services available on a twenty-four (24) hour basis, seven (7) days a week, year-round to individuals requiring emergency medical care. Similarly, in several SSA countries, EMS providers apply the standards related to the place of operations (station), including sanitation measures for (i) all areas used for storage of equipment and supplies; (ii) all soiled supplies and used disposable items and (iii) storage of regulated waste (i.e. red or orange bags or containers clearly marked with a biohazard label). Further, the standards on storage and security of drugs and related supplies have different content. In Niger, these are limited to presence of simple infrastructure conditions –

refrigerator, air conditioner, etc. In Lesotho, the area used for storage of drugs and administration devices and the drug kit used on an EMS vehicle shall comply with requirements established by the National Food and Drug Administration.

Cameroon developed regulations regarding the place of operations of private EMS providers. Thus, a private provider shall maintain a fixed physical location within the administrative area of the authorization. Additionally, it is necessary to comply with the following space standards (without surface requirements): (i) a room for patients or their families; (ii) one or more rooms designated for disinfection and routine maintenance of the EMS vehicles, as well as the maintenance of equipment; (iii) one or more areas, large enough to permit the parking of the EMS vehicles included in the authorization.

In Zimbabwe, the requirements on the place of operations are set by the Minimum Standards developed by the Health Professions Authority for EMS provider registration. Similarly to other SSA countries, these cover simple infrastructure conditions, namely – areas (reception, call room, service area) and technical specifications (washable, impervious and non-slippery floor; walls to be brought to a smooth, impervious and washable finish; adequate ventilation and lighting provided by both natural and artificial means, wash-bay for vehicles decontamination, etc.).

The Operational Medical Director is not required by EMS provider standards in all SSA countries. However, there are significant differences in the requirements an EMS provider shall comply with. EMCS Cameroon limits to a single condition – each EMS operational unit shall be managed by a Medical Coordinator. Lesotho extended the requirements; thus, a medical officer with suitable emergency medical qualification and experience must be appointed as Operational Medical Director of the EMS provider. Additionally, the Operational Medical Director must be registered with the National Medical Board in terms of health professions legal provisions.

The same paucity of provisions has been identified with respect to standards on EMS provider quality management reporting. The Lesotho case is worth mentioning. A quality assurance team periodically assesses the quality and appropriateness of emergency care delivered by the EMS provider. However, the applied procedures and tools are not well defined. Burundi has a Manual of Procedures issued by the Health General Inspection (MoH Department), which includes operation standards and requirements for an EMS provider to comply with. However, the authors conclude that these are not supported by comprehensive provisions.

Table 8 - EMS provider standards and requirements across SSA countries

| | Place of Ops. | Avail. 24/7 | Equip. & Suppl. | Drug storage | SOPs | Med. Direct. | Pers. Records | EV Records | Patient Records | Quality Mgmt. | ERA Stands. | EV Class. | EV Equip. RQMTS | EV Permit | EV Safety | EV Sanitation | EV Warnings | EV Comms. | EV Markings | Other RQMTS | Non-transport vehicle spec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BWA | - | - | - | - | - | - | - | - | - | - | - | + | + | + | + | + | - | - | - | - | - |
| BFA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| BDI | + | + | + | + | + | + | + | + | + | + | + | - | - | + | - | - | + | - | + | + | + |
| CPV | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CMR | + | - | - | - | - | + | - | - | - | - | - | + | + | + | + | + | + | + | + | + | + |
| CAF | - | - | - | - | - | - | - | - | - | - | - | + | + | + | + | + | + | + | + | + | + |
| TCD | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| COM | - | - | - | - | - | - | - | - | - | - | - | + | + | - | + | - | + | - | + | - | - |
| COG | - | + | - | - |  | - | + | + | + | + | + | - | - | - | - | - | - | - | - | - | - |
| GAB | - | - | - | - | - | + | - | - | - | - | - | + | - | + | + | + | + | - | + | - | - |
| LSO | + | + | + | + | + | - | + | + | + | - | + | - | + | - | - | + | + | + | + | + | - |
| LBR | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| MDG | - | - | + | + | - | - | - | + | - | - | - | + | + | + | + | + | + | + | + | + | + |
| MRT | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | + | - | + |
| MWI | - | - | - | - | - | - | - | - | - | - | - | + | - | + | + | + | + | + | + | + | + |
| NER | + | + | + | + | + | - | + | + | + | - | - | + | + | + | + | + | + | + | + | + | + |
| RWA | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | - |
| SEN | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| SDN | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SLE | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TGO | - | - | - | - | - | - | - | - | - | - | - | - | + | + | + | + | - | - | - | - | - |
| TZA | - | - | - | - | - | - | - | - | - | - | - | + | + | + | + | + | + | + | + | - | - |
| ZMB | + | - | + | + | + | - | + | + | + | - | - | + | + | + | + | - | + | + | + | - | - |
| ZWE | + | - | + | + | - | - | + | + | + | - | - | + | + | + | - | - | + | + | + | - | - |
| UGA | - | - | - | - | - | - | - | - | - | - | - | + | + | + | + | + | + | + | + | + | - |

Abbreviations: Ops. – Operations; Avail. – Availability; Equip. – Equipment; Suppl. – Supplies; Med. – Medical; Dir. – Director; EV – emergency vehicle; Pers. – Personnel; Mgmt. – Management; Stands. – Standards; Class. – Classification; RQMTS. – Requirements; Comms. – Communications; Spec. – Specifications; EV – emergency vehicle

# II.8 EMS Vehicle and Equipment Standards

The requirements on EMS vehicles (types and their equipment) vary among SSA countries and in-country EMS providers (see Table 9 - EMS Vehicle and Equipment Standards in Botswana, Cameroon, and Uganda). Though the standards on EMS vehicles are more defined than EMS providers standards, the requirements do not achieve internationally recognized EMS vehicle standards. One notable example is in Rwanda (see box below).

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**Box 11 - Rwanda EMS Vehicle & Equipment Standards**

A ground EMS vehicle in Rwanda must comply with the following requirements: (i) all vehicles must have five doors (one on the driver's side, one on the passenger side, one behind the passenger seat, two at the rear side); (ii) all vehicles must have at least three seats with seat belts (one for the driver, one for the passenger and one near the patient bed); (iii) all vehicles must have air conditioning equipment; (iv) all vehicles must have the following equipment – oxygen apparatus, vacuum mattress, defibrillator, ventilator, flexible stretcher, hanging set, spine board with harnesses, drugs, emergency kit, intubation kit, head immobilizer, neck immobilizer, vital signs monitor. An EMS operations permit implies on-board presentation of an identification card, number plates, insurance vignette, logbook and the travel authorization.

Table 9 - EMS Vehicle and Equipment Standards in Botswana, Cameroon and Uganda

| | Botswana | Cameroon | Uganda |
|---|---|---|---|
| **General** | Lack of a regulatory framework on classification of EMS vehicles & equipment requirements. Vehicle equipment requirements are approved by the EMS provider and evaluated according to check lists. | Regulates the types of EMS vehicles to be used in the framework of EMCS by the Order of the Ministry of Health. | Categories are consistent with international norms which use the same classification. |
| **Vehicles** | Three categories of EMS vehicles: <br> 1. Rapid Response Vehicle; <br> 2. Intermediate Ambulance; <br> 3. Advanced Life Support Ambulance. | Four EMS vehicles categories: <br> 1. Category A (types B and C ambulances) - emergency ambulance equipped for the transport of a single horizontal patient; <br> 2. Category C (type A ambulance) – transport ambulance equipped for the transport of a single horizontal patient who is expected to become emergency patient; <br> 3. Category D – medical transportation vehicle equipped for the transport of maximum three patients who are not expected to become emergency patients. | Ground EMS vehicles are categorized into three types: <br> 1. Type A (patient transport ambulance); <br> 2. Type B (emergency ambulance); <br> 3. Type C (mobile intensive care units). |
| **Equipment** | Public EMS providers have rapid response vehicles only in Gaborone, the capital city. Also, two private EMS providers – MedRescue and Emergency Assist, have rapid response vehicles in Gaborone. | The Ministry of Health designed equipment requirements by type of ambulance to which both public and private EMS providers shall comply with. | The standards in force require basic life support equipment for type B and advanced life support equipment for Type C. |

A cluster of SSA countries do not report inclusion of classification systems in regulations for ground EMS vehicles. Some countries such as Togo lack the regulatory framework and therefore, private EMS providers developed internal procedures on ground vehicle equipment. Moreover, the equipment requirements are scarce. For example, in Lesotho and Zimbabwe the requirements on vehicle equipment are limited to stretcher, oxygen, defibrillators, drugs emergency kit, etc.



Figure 12 - Togo Assistance Ambulance

*Source: http://www.togoassistance.tg/*

The lack of a regulatory framework in Togo led private EMS providers (i.e. Togo Assistance) to develop internal procedures on ground vehicles equipment. Thus, Togo Assistance uses a single type of ambulance (type B ambulance, see

above), which has the following equipment – oxygen apparatus, Ambu bag (bag valve mask), mattress, defibrillator, crutches, rigid hand grips, stretcher, head and neck immobilizers, blood pressure monitor, pulse oximeter, Guedel cannulas, orotubus, Trousseau dilatator and scissors, and drugs (glucose 10%, ISS 0.9%, Ibuprofen tab., Diclofenac tab., Paracetamol tab., Amoxicillin caps., Betadine, sterile compresses, sterile gloves, bulk gloves, etc.).

A group of SSA countries (Cameroon, Central African Republic, Senegal, Sudan and Uganda) report that the EMS system also includes specialized emergency medical services vehicles – e.g. neonatal ambulance, trauma ambulance, mobile intensive care unit, etc. At the same time, there aren't any regulations in place to establish the specifications for each type of vehicle. In Uganda, for example, the neonatal ambulance is similar to ALS ambulance, but equipped additionally with transport incubator, neonatal ventilator etc.

Most SSA countries have requirements on ground EMS vehicles warning signs and markings that include the following elements: (i) flashing or blinking lights installed to provide adequate visible warnings from all four sides; (ii) flashing and blinking red (blue) or red (blue) and white lights installed on or above the front bumper and below the bottom of the windshield; and (iii) audible warning device installed to project sound forward from the front of the EMS vehicle. EMS vehicle markings are represented by: (i) a reflective horizontal band of an exterior use material, minimum of four inches continuous in height, permanently affixed to the sides and rear of the vehicle body; (ii) permanently affixed lettering, minimum of three inches in height, of a color that contrasts with the surrounding vehicle background – (a) the name of the EMS provider on both sides of the vehicle body, b) the word AMBULANCE in reverse on the vehicle hood or bug deflector / the word AMBULANCE on or above rear doors,

c) emergency phone number. Most of these are mainly provided by the traffic and road safety legislation (ex. Botswana Traffic Act, Uganda Traffic and Road Safety Act). In Cameroon, these norms are established by the Ministry of Health both for public and private EMS providers.

Several SSA countries apply minimal requirements on EMS vehicle occupant safety. Thus, an occupant shall use mechanical restraints as required by traffic and road safety legislation. Stretcher patients shall be secured in the stretcher utilizing a minimum of three straps unless contraindicated by patient condition. Equipment and supplies in the patient compartment shall be stored within a closed and latched compartment or fixed securely in place while not in use.

No institutionalized protocols or rules were found pertaining to EMS vehicle sanitation. Even in SSA countries that have reported the requirements for EMS vehicle sanitation, these are not in accordance with international standards in the field or country standards established by the Sanitary Authority and regulatory framework on occupational safety and healthcare. In most cases, these requirements are not comprehensive. During the COVID-19 pandemic and other infectious disease health emergencies such as the Ebola Virus Disease, there has been a push from the international community to improve local protocols on cleaning and sanitation of emergency vehicles. However, it is unclear at this time whether these recommendations have been considered or implemented.

Uganda has the most comprehensive, detailed sanitation requirements, which also cover the inventory of used equipment, appropriate sorting and disposal management. Thus, the blankets, pillows and mattresses used in the EMS vehicle shall be intact and kept clean and in good repair. A device inserted into the patient's nose or mouth that is single-use shall be disposed of after use.

A reusable item shall be sterilized or high-level disinfected according to the guidelines in place before reuse. If not individually wrapped, this item shall be stored in a separate closed container or bag. A used sharp item shall be disposed of in a leak proof, puncture-resistant and appropriately marked biohazard container (needle-safe device/sharps box) that is securely mounted.

In Niger, the EMS vehicle sanitation requirements are limited to vehicle cleaning and disinfection after each transportation or intervention. Similarly, Togo Assistance's (country private EMS provider) internal procedures establish the cleaning and disinfection of the vehicle after each intervention. The complete disinfection and sanitation are realized using appropriate broad-spectrum antibacterial products. The cleaning and disinfection procedures applied to the EMS private providers' vehicles in Cameroon are based on the following documents: (i) protocol on vehicle sanitation after patient transportation; (ii) protocol on weekly vehicle sanitation; (iii) protocol on vehicle sanitation after trauma or contagious patients' transportation. Each private EMS provider shall be responsible to maintain appropriate records of vehicle cleaning and disinfection activities, which shall be accessible for review by competent authorities upon request.

Botswana provides an example of EMS vehicle sanitation protocols that are not in place. However, the Ministry of Health is in process of developing Infection Control Guidelines which, among others, will address the sanitation of EMS vehicles. During the time of the survey, sanitation of the EMS vehicle after patient transportation is standard practice, but it is not clear how EMS providers manage the vehicle's contaminated surfaces after body fluid spillage, including after transportation of patients with infectious conditions.

In situations where traditional ambulances cannot reliably access sick and injured patients,

alternative vehicles are often used. Given the relative ease with which these alternative transport vehicles can be fashioned using locally available resources, the development of minimum safety standards should be considered.

## II.9 EMS Provider Inspection

In-service inspection of EMS providers is rarely utilized as a compliance instrument. Only in a few countries , the EMS standards state that an inspection is necessary to be regularly carried out to determine whether the EMS provider complies with the minimum standards and is suitable and adequate for the purpose for which it was authorized. However, inspection procedures are not supported by comprehensive provisions.

Zimbabwe provides an example of the most comprehensive provider inspection. It reports utilization of (i) initial inspection – conducted for EMS providers applying for registration with the HPA to assess minimum requirements are met; (ii) routine inspection – conducted to check if standards are maintained; (iii) joint and multidisciplinary inspections – conducted based on the recommendation of the HPA Registration Committee; (iv) investigative inspection – conducted following a complaint against a substandard premises of the EMS provider; (v) follow-up inspection; and (vi) verification inspection. Some countries provide an initial inspection prior to issuance (Zambia) and periodic inspection of its activities, facilities and equipment (Senegal, Zambia, and Uganda. In Rwanda, a duly authorized supervisor must consider whether EMS providers comply with the standards in the framework of monthly performance evaluations.

# III. Emergency Medical Services Delivery

## III.1 EMS Delivery Planning

Several SSA country health planning systems have established EMS jurisdictions and/or catchment areas . The standards and regulations in force do not appear to stipulate the specific criteria used to define EMS jurisdictions/catchment areas. Thus, it is not clear if the establishment of these areas are based on drive time values (e.g., 9, 15 or 30 minutes) of the polygon area based on posted speed limits, or minimum distances, or simply the boundaries of territorial-administrative units (urban, suburban, rural).

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[65] Comoros, Cameroon, Lesotho, Madagascar, Malawi (not yet operational), Rwanda, Senegal, Sudan, Zambia, Zimbabwe, Uganda
[66] Cameroon, Congo Brazzaville, Lesotho, Niger, Senegal, Malawi (pilot)

In most cases, the EMS catchment areas appear to indirectly reproduce the service areas of hospitals or the planning areas in which those hospitals are located. Thus, the place of operations (station) of the EMS provider is established in the designated hospitals. In Congo Brazzaville, for example, apart from the ambulances fleet of the Ministry of Health, each hospital has two to three ambulances to ensure inter-facility cooperation and referrals, as well as its participation in crisis and disasters. Cameroon uses regional hospitals as the operational units of the Emergency Medical Care Service, which helps to ensure regional coordination of the pre-hospital care, including care provided by private providers. Malawi is in the process of piloting six trauma centers responsible for catchment areas along the M1 highway, together with pre-hospital care in the form of 10 staffed ambulances. These are complemented by a main ECC at Kamuzu Central Hospital and a backup ECC at Queen Elizabeth Central Hospital (see Chapter 6 for additional details).

# III.2 EMS Dispatch Standards

Several SSA countries have in place policies at the national level or with the EMS provider that enable emergency medical dispatch as a component of the EMS system. However, the survey results reveal that regulations are fragmented, covering only certain areas of the dispatch process or do not reflect international standards. For example, Liberia reports few standard operating procedures in the field of dispatch available at national level. In Botswana, there are no national level operational policies and protocols applicable to all authorized dispatchers. Each EMS provider has its own way of doing dispatch and only one private provider uses the 911 EMD Protocol. Uganda drafted National EMD policies that will substitute the EMS provider level ones after approval.

Regionally, the current conception of the national level EMD standards lack clarity in a number of respects, including:

• identifying the patient's location and identity such that responders can be successfully dispatched to the scene;

• processing the call to ascertain the presence of any life- or limb-threatening issues and differentiate high acuity from low acuity calls that might be suitable for alternative responses;

• providing telephone-based instructions to the caller to assist with basic early patient care prior to responders arriving on scene;

• dispatching the EMS vehicles; and

• selection of destination hospital and finding the optimal path.

Without clarity in these respects, the standards cannot adequately hold EMS providers accountable. Consequently, the paucity of dispatch policies, standards and system configurations have impeded the development of functional EMD models across SSA countries. Those SSA States that do have provider level dispatch

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[67] Burkina Faso, Congo Brazzaville, Lesotho, Liberia, Zambia
[68] Botswana, Mauritania, Senegal, Sudan, Tanzania, Togo, Zimbabwe, Uganda

policies in place are not standardized to apply to operational processes and call-processing (i.e. scripted instructions and questions, etc.).

In Cameroon, according to the regulations in force (i.e. Order of the Ministry of Health), each operational unit of the Emergency Medical Care Service shall include both the public safety answering point (PSAP) and the Emergency Control Center (ECC). Thus, this co-location indirectly ensured the decentralization of call-processing and dispatching. Additionally, this unit is utilized to centrally coordinate information about the bed status of healthcare facilities at regional level (i.e. catchment area).

The most common practice among SSA countries is the dispatching of the closest ambulance to the scene. Further, in lack of comprehensive dispatch policies, different dispatch schemes are used that are outside the EMD performance improvement interventions. For example, in Cameroon, the General Practitioner Dispatcher, assisted by a Dispatcher Assistant, assigns the ambulances and establishes their paths. Authorized private EMS providers are included in the pool of ambulances coordinated by the Call and Emergency Control Center within the catchment area. At the end of each intervention, a medical dispatch report, which includes such data as the nature of the call, emergency care administered, etc., is submitted to the Medical Coordinator of the Call and Emergency Control Center.

For most SSA countries, however, standard procedures to regulate the dispatch unit and community first-responders cooperation - namely the process of activating and sending resources to the scene – do not exist. Lesotho reports an "inverse" scene resource activating algorithm. The community, as first respondent, alerts the paramedics (if they are positioned or available in the area). The triage is realized on the scene and patients are transported to the district

hospital where the second triage is performed to identify patients referred to the highest level of care (i.e. national referral hospital). If there are no paramedics, the first responders take the responsibility to transport the patient to the district hospital using available modes of transportation.

Figure 13 - EMS vehicle dispatch scheme applied in the EMS system
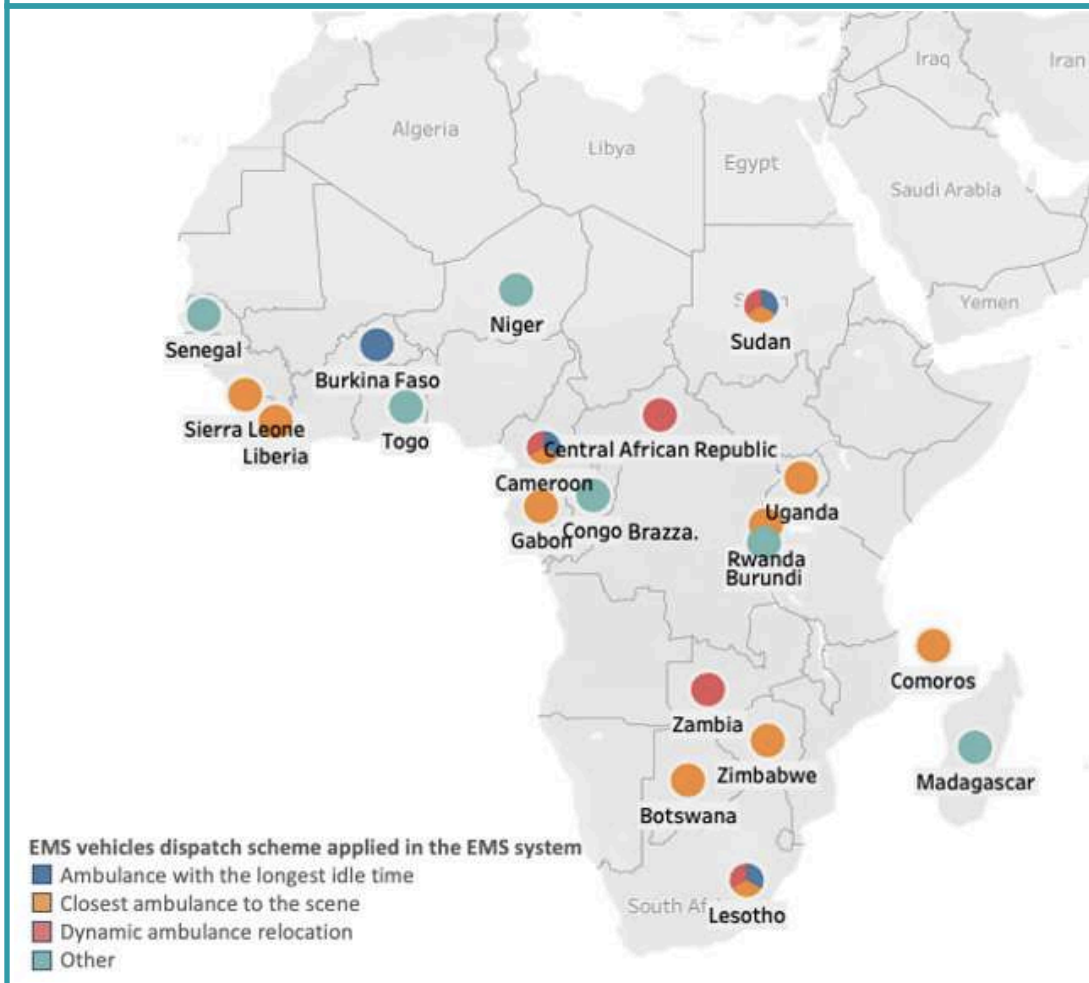
Out-of-hospital triage formal algorithms and protocols are reported by several SSA countries, but in most cases, these are limited to the EMS provider level (see Figure 14). In Uganda, the out-of-hospital triage protocols used by EMS providers follow the accrediting agency's triage algorithms.

Figure 14 - Out-of-hospital triage protocols
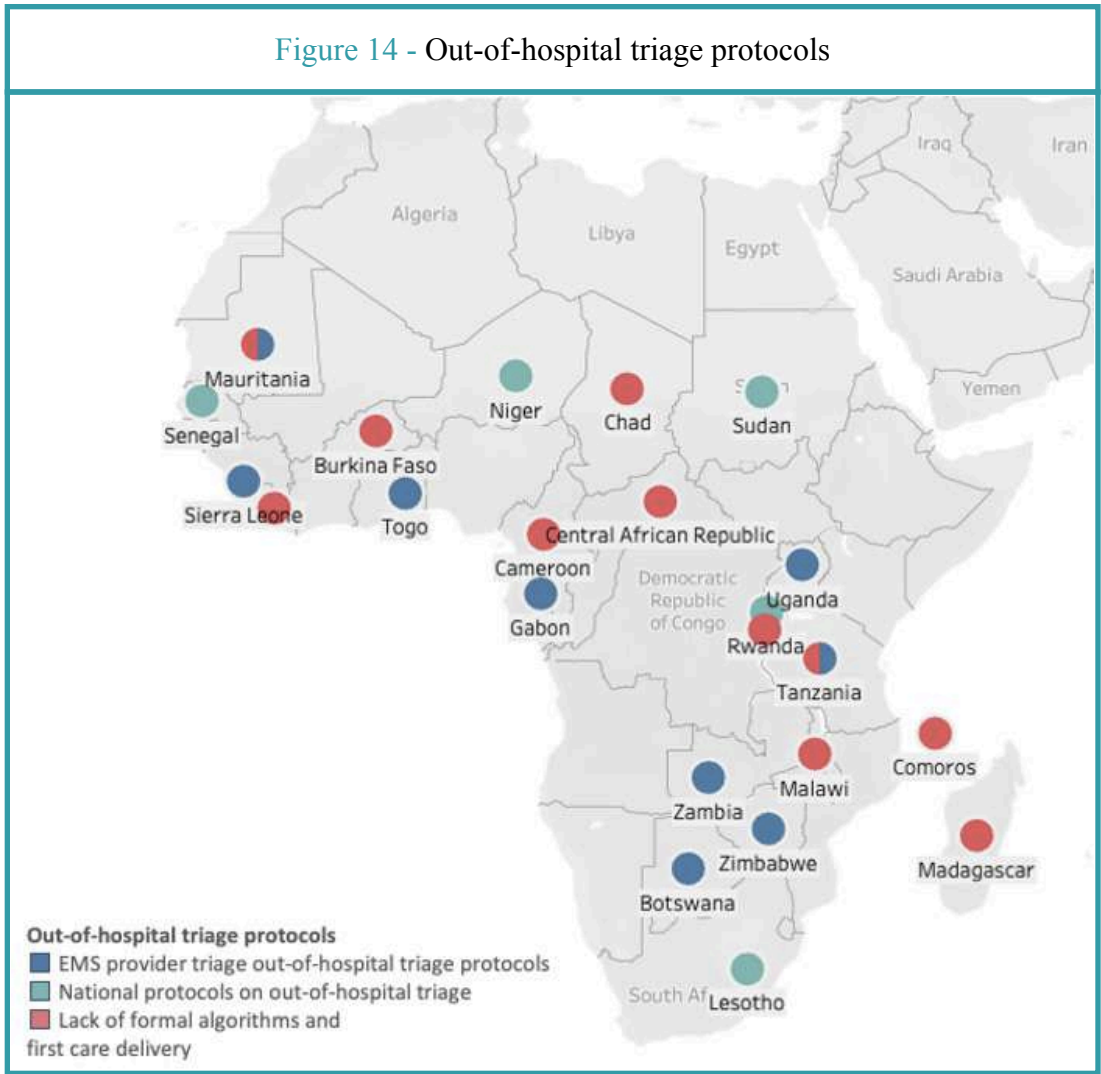
Transporting patients to an appropriate hospital based solely on the severity of a patient's clinical condition represents the most frequently applied triage schemes in SSA countries (see Table 10). A group of SSA countries reports utilization of the Resource-Based START[69] as the main and/or single out-of-hospital triage scheme, in which mapping between the severity level and transport priority changed after a threshold time. However, the authors assume the existence of specific situations (i.e. crisis and disaster response, etc.) when Resource-Based START is required to be applied as the motivation of this scheme is that after a certain period the survival probability of lower severity patients deteriorates faster than of patients with higher severity.

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[65] Simple Triage and Rapid Treatment (START) is a triage approach developed in the United States for Mass-Casualty incidents (MCIs) which classifies patients into four different classes. Minor patients are those who are capable of walking away from the scene; delayed patients are those for whom treatment may be delayed by some time without risking their lives; immediate patients are those who will deteriorate most rapidly without care; and expectant patients are those who are expected to die no matter what care is given. After the patients are classified, START gives the highest priority to patients in the immediate class, then to those in the delayed class. Once the system is cleared of patients in these time-critical classes, resources may be used for those in the minor and expectant classes.

Table 10 - Triage algorithm in patient transport priority decision-making

| Triage algorithm | Countries |
|---|---|
| Resource-Based START | Lesotho |
| | Liberia |
| | Rwanda |
| | Sudan |
| | Zambia |
| | Zimbabwe |
| | Uganda |
| Other (i.e. severity of patient's clinical condition) | Burundi |
| | Central African Republic |
| | Congo Brazzaville |
| | Niger |
| | Senegal |
| | Togo |
| | Zambia |

Specific dispatch and response procedures in multi-casualty or mass casualty incidents are identified in a small group of SSA countries, though most countries have no such procedures. The decision regarding which hospital a patient will be transported to for emergency care is governed by formal and informal algorithms. While the nearest hospital with available beds is a reasonable decision in most situations, the congestion level at the candidate hospital is considered when determining the destination (see Table 11). This is particularly relevant to a mass casualty incident where the availability and capability of nearby hospitals must be appropriately distributed simultaneously to many patients requiring different levels of care. Uganda's algorithm in place also considers the casualties' responsiveness. According to this, responsive patients can decide on their destination hospital, while the non-responsive ones are mandatorily transported to the nearest public healthcare facility.

Table 11 - Dispatch and response procedures in multi-casualty or mass casualty incident

| Dispatch and response procedures | Countries |
|---|---|
| Disaster Medical Dispatch Protocol | Lesotho<br>Niger<br>Sudan<br>Zimbabwe |
| Novi Plan | Senegal |
| White Plan (for hospital response) | Madagascar<br>Senegal |
| ORSEC (Emergency Response) Plan | Niger |
| Red Plan | Senegal |
| Ad-hoc interventions | Uganda |
| Other (Police Department Protocols) | Uganda |
| No procedures | Botswana<br>Burkina Faso<br>Burundi<br>Cameroon<br>Central African Republic<br>Chad<br>Comoros<br>Gabon<br>Liberia<br>Mauritania<br>Rwanda<br>Togo<br>Zambia<br>Malawi<br>Sierra Leone<br>Tanzania |

In Uganda, the ascribed responders assemble at the scene and manage the case according to the competence of the crew and appropriateness of the equipment.

## Box 12 - EMS Dispatch and Response Procedures in Zimbabwe

The formal declaration of a mass casualty incident is made by an officer or chief of the agency in charge. At the first stage, the senior paramedic at the scene is in charge of the incident, but as additional resources arrive, a senior officer or chief will take command, usually using an incident command system structure to form a unified command to run all aspects of the incident. Also, an evaluation needs to be done by the staff receiving the emergency call regarding a multitude of situations involving many people or potentially involving many people.

Table 12 - Algorithms for destination hospital selection

| Algorithms | Countries |
|---|---|
| Normative judgments – designated hospital in catchment area, etc. | Burundi<br>Cameroon<br>Lesotho<br>Rwanda<br>Senegal<br>Uganda |
| Nearest emergency department with available beds | Cameroon<br>Chad<br>Comoros<br>Congo Brazzaville<br>Lesotho<br>Liberia<br>Niger<br>Senegal<br>Sierra Leone<br>Sudan<br>Togo<br>Zambia |
| Complex method - candidate ED available capacities, waiting times and distance | Burundi<br><br>Cameroon<br>Congo Brazzaville<br>Lesotho<br>Senegal<br>Sudan |
| Waiting times, and distances from the incident scene | Burundi<br>Cameroon<br>Chad<br>Lesotho<br>Senegal |

# III.3 EMS Delivery Standards

The policies and procedures on EMS patient care records vary across SSA countries, from mandatorily established and maintained records under the authority of EMS agency/MoH, as required by law and the ethical rules, to provider designed records or no records at all. There is a low degree of standardization of EMS patient care records within and between EMS systems. This applies to the structure of the records, the requirements for third-party data, the data to be collected (i.e. subjective and objective information, assessment, en-route re-assessment, treatment plan, patient refusal, etc.) and their uses (i.e. confidentiality, etc.), completion, referral, retention and reporting within EMS system. However, in most SSA countries (i.e., Botswana, Burkina Faso, Burundi, Lesotho, Liberia, Madagascar, Niger, Rwanda, Senegal, Sierra Leone, Sudan, Togo, Zambia, Zimbabwe, Uganda) each patient treated or conveyed by the service must be recorded on the EMS patient care record as completely and accurately as practical and per provider guidelines.

In Zimbabwe and Botswana, the maintenance and handling of patient care records follow the internal standards of the EMS provider. In Uganda, each EMS provider has their own record system for pre-hospital services. However, the differences are obvious. The EMS providers within the Directorates of Police Health Services use a preliminary record or handwritten improvised patient record sheet. The Ministry of Health has developed Health Management Information System (HMIS) tools, including in the area of pre-hospital care, and which are estimated to be implemented next years after approval. Similarly, Liberia currently uses a non-standardized basic system for patient care record.

Further, the study did not find applicable legal provisions or regulations in accordance to which the EMS patient care report shall be provided to other sources. A group of SSA countries[70] report the administrative requirement to leave a formal copy of the EMS patient care report with the patient's receiving healthcare provider at the time of transfer.

The EMS systems of the SSA countries surveyed do not currently possess the data collection capability and research base required to systematically evaluate and provide guidance regarding improvement of the overall level of EMS. As a result, systems for EMS quality assurance at national or local level are reported only in Burundi, Lesotho, Zambia and Senegal. In Burundi, there is a strategy of evaluating the performance of the healthcare providers and of the emergency medical services. However, this framework does not include response times as a measurement of the quality assurance process. Lesotho has a more institutionalized approach in this regard. The Ministry of Health has an office of quality assurance charged with conducting field visits to assess the quality of provided emergency medical services.

The use of response time measures and the set-up of universal guidelines for response time is not widespread across SSA countries (see Figure 14). Even SSA countries reporting the use of response time measurement as part of the quality assurance assessment present inconsistent measures which lead to difficulties in further benchmarking the response time, setting national standards, or meaningfully quantifying response time improvement.

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[70] Botswana, Burkina Faso, Congo Brazzaville, Lesotho, Liberia, Madagascar, Niger, Senegal, Zambia, Zimbabwe

Figure 15 - Utilization of response time in the quality assurance process
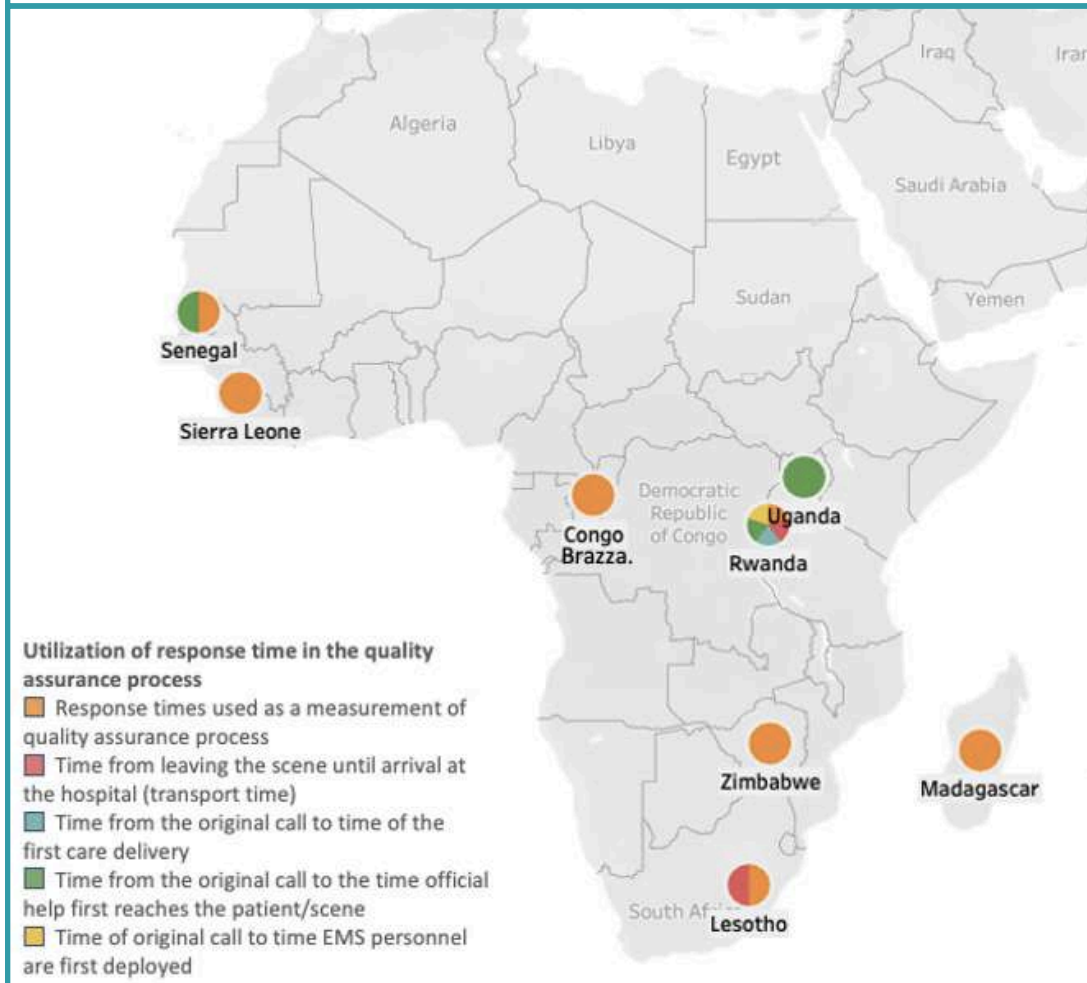
Initiatives to measure and/or monitor patient satisfaction are limited among SSA countries. In most cases, they are realized outside the framework of a comprehensive quality assessment program; and without incorporating other sources of information, such as the analysis of work processes, employee satisfaction levels, and other objective quality indicators. In Burundi, community surveys are conducted by local associations to assess the patient satisfaction. Similarly, in Lesotho there is a team in each district responsible to realize questionnaire-based satisfaction surveys. In Madagascar, the initiatives are limited to patient request books. By contrast, in Zimbabwe and Zambia patient satisfaction monitoring is based on the checklist and tools developed by the Ministry of Health. Togo Assistance, a private EMS provider, carries out annually satisfaction surveys, by including transported patients in the pool. Some SSA countries are improving the regulation of EMS specific medico-legal issues. Thus, issues such as EMS personnel liability, misrepresentation of qualifications, the provision of care outside of protocols, consent and informed consent in pre-hospital environment, declaration of death and requirements of a DOD document are increasingly becoming EMS system aspects to be more closely regulated (see Table 13).

Table 13 - EMS specific medico-legal issues regulation across SSA countries

| | EMS Personnel Liability | Qualification Misrepresentation | Extraordinary Care Outside Protocol | Consent & Informed Consent | Provider Disagreement over Patient Needs | DNR Orders | Patient Abandonment | Declaration of Death |
|---|---|---|---|---|---|---|---|---|
| BWA | + | - | - | - | - | - | - | - |
| BFA | - | - | - | - | - | - | - | - |
| BDI | - | - | - | - | - | - | - | - |
| CPV | - | - | - | - | - | - | - | - |
| CMR | + | - | + | - | - | - | - | - |
| CAF | - | - | - | - | - | - | - | - |
| TCD | - | - | - | - | - | - | - | - |
| COM | - | - | - | - | - | - | - | - |
| COG | - | - | - | - | - | - | - | - |
| GAB | - | - | - | - | - | - | - | - |
| LSO | - | - | - | - | - | - | - | - |
| LBR | - | - | - | - | - | - | - | - |
| MDG | + | + | - | - | - | - | - | - |
| MRT | - | - | - | - | - | - | - | - |
| MWI | - | - | - | - | - | - | - | - |
| NER | + | + | + | - | - | + | + | + |
| RWA | - | - | - | - | - | - | - | - |
| SEN | - | - | - | - | - | - | - | - |
| SDN | - | + | - | + | - | - | - | + |
| SLE | - | - | - | - | - | - | - | - |
| TZA | - | - | - | - | - | - | - | - |
| TGO | - | - | - | - | - | - | - | - |
| ZMB | + | + | + | - | - | - | - | - |
| ZWE | + | + | - | - | - | - | - | - |
| UGA | - | + | - | - | - | - | - | - |

# IV. EMS System Human and Other Resources

A range of EMS vehicle staffing formulae exist across SSA countries – both in the number of practitioners that compose an ambulance crew and the levels of training each possesses – that are broadly determined by the model of EMS system adopted by the country (i.e. Franco-German or Anglo-American discussed in Chapter 1), the level of development of EMS regulations and national standards, as well as the availability of operational resources. An important sustainability consideration is the prospects for developing an appropriate cadre of staff that correspond to the chosen EMS model. For example, given chronic physician staffing shortages in hospitals across the region, the feasibility of implementing a Franco-German model may not be achievable in the long run. At this time, staffing standards for EMS vehicles expressly defined by regulations in force have yet to be introduced in any SSA country. One standard that does appear ubiquitous across SSA countries is (an assumption by providers) that a minimum of two crew members are necessary to staff the EMS vehicle that transports a patient to the destination healthcare facility. This is the case regardless of the type of EMS personnel or the individual crew members' individual scopes of practice and/or level of skills. However, the training or certification level, and the scope of practice, for each of these two crew members is debatable and varies across the respondents sampled. A review of the SSA countries regulations and standards show that, in most cases, for type A ambulances, a single patient transport assistant or patient transport technician is required.

Figure 16 -EMS vehicle staffing requirements
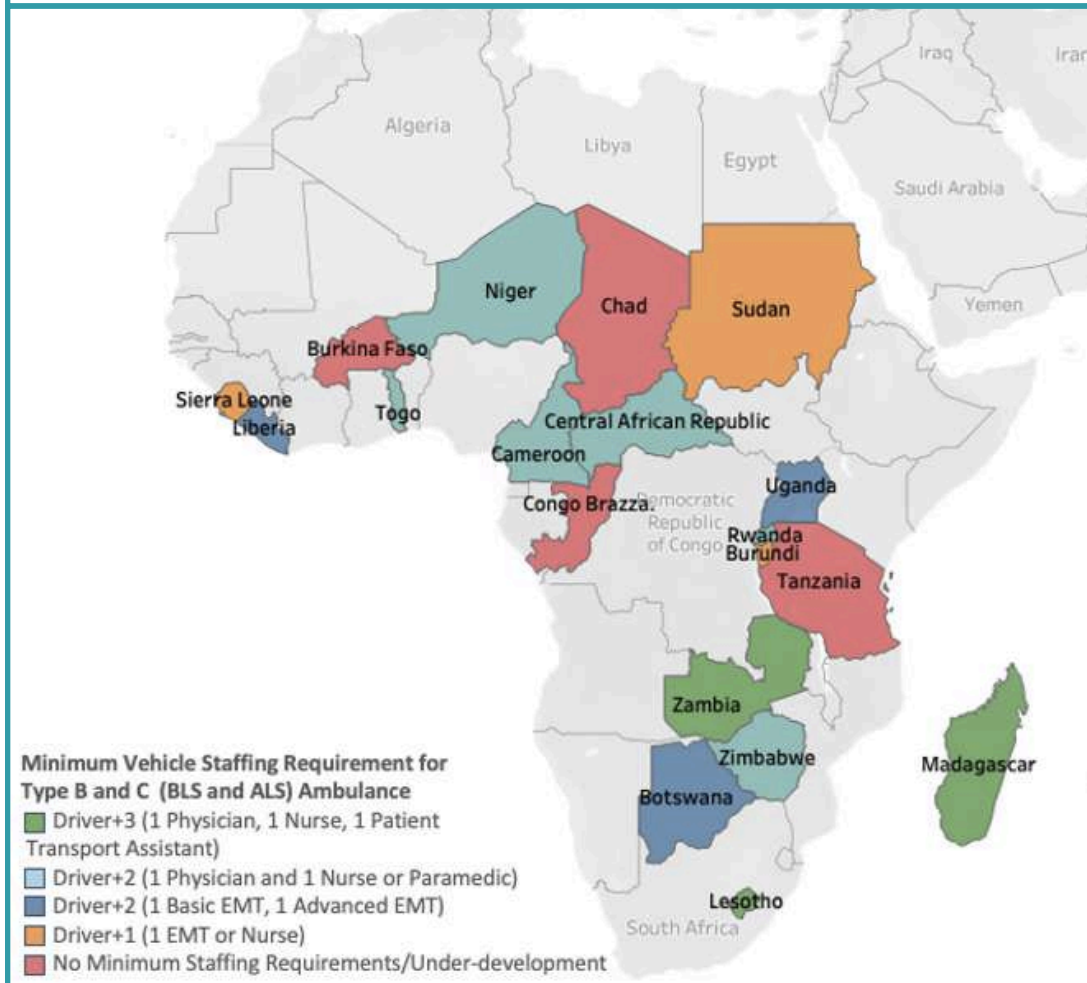


Type B and C ambulances are the most used in SSA (see Figure 15). Some SSA countries (Lesotho, Rwanda, Central African Republic, Togo, etc.) utilize all type B ambulances in a single-tier system, sending these units to all requests for EMS. Others (Congo Brazzaville, Madagascar, Botswana, Cameroon, etc.) use separate response type A (patient transport) and type B and C (or BLS and ALS) ambulances, dispatched together or not and converging on the scene to treat a subpopulation of all EMS patients considered as the most seriously ill or injured. Training requirements for these personnel – non-official education, short-term or first aid courses,

etc., do not exist. The staffing standards for type B and C (BLS and ALS) ambulances vary. For an EMS vehicle type B or BLS, some countries specify a driver and an individual in addition to the driver who is an emergency medical technician or higher, and who is responsible for the patient until the patient is (i) discharged in accordance with written physician orders, or (ii) delivered to a healthcare facility appropriate for the patient's conditions. Similarly, the requirements do not specify if the ambulance driver must be certified as an emergency medical responder. In other countries, such as Madagascar, Lesotho, Niger, Rwanda, Central African Republic and

Zimbabwe, the requirements specify that an ambulance must have a physician (mandatorily) in critical cases, a certified nurse or EMT and in some cases, a patient transport assistant.

Cameroon varies the requirement for the ambulance crew members. Thus, the General Practitioner Dispatcher of the EMS unit establishes the ambulance intervention team depending on the nature of EMS response. Following the same approach, in Lesotho, the ambulance staffing norms require a physician exclusively in critical cases; otherwise the ambulance crew is composed of a driver, a qualified nurse, a paramedic and an auxiliary nurse. Liberia does not have approved minimum standards; however, the crew is composed of a driver and two EMT personnel. In Botswana, EMS vehicle staffing requirements are set as recommendations of the Botswana Health Professional Board for EMS and establish one Basic EMT (1-year trained) and one Advanced EMT (2-year trained). However, due to human resource limitations, different EMS providers apply other staffing formulae – Driver and 1 Basic or Advanced EMT; Driver and 1 Nurse; Driver, 1 Basic or 1 Advanced EMT and 1 Nurse. In Niger, the staffing norms mandatorily require a physician specialized in Anesthesiology, Emergency Medicine or a General Practitioner and an anesthetist or emergency nurse.

**Personnel and staffing requirements** for private EMS providers across SSA countries are either not supported by comprehensive regulations or are not like the public providers. In Togo, private EMS providers establish the composition of ambulance crew members based on their internal procedures. Thus, the team is composed by paramedics, rescuer-paramedics, qualified nurses, auxiliary nurses and emergency physicians. Botswana private EMS providers staff their ambulances according to their own rules – EMTs with short-term training. Thus, a Basic EMT can become an ambulance crew member after a

four-week training, and an Advanced EMT after a twelve-week training. By contrast, Cameroon designed regulations regarding the personnel of private EMS providers. Thus, ambulance crew members must be (i) physicians and other qualified medical personnel who have a private practice license issued in accordance with the regulations in force, (ii) holders of an Emergency Care Recycling Certificate issued by a Call and Emergency Control Centre (every three years), and (iii) vaccinated against hepatitis B, diphtheria, tetanus and poliomyelitis. Additionally, there are no requirements for the ambulance drivers (all types) to be certified as an emergency medical responder, but they must be (i) holders of a category B driving license, with a seniority of at least three years, (ii) holders of a medical certificate of aptitude renewed every twelve months, (iii) vaccinated against hepatitis B, diphtheria, tetanus, poliomyelitis, and (iv) holders of an Ambulance Driver Recycling Certificate issued by a Call and Emergency Control Centre (every three years).

In terms of **ambulance dispatch**, there is a lack of EMD personnel staffing standards and/or requirements among SSA countries. Cameroon applied normative judgments to establish the staffing needs (qualitative) of the Call and Emergency Control Centre. Thus, the Centre should be staffed with a Medical Coordinator, General Practitioner Dispatchers and Dispatcher Assistants to accomplish all dispatch and EMD functions as established by the Order of the Ministry of Health. Qualitative staffing needs were defined using time equivalent measurements (required hours of coverage). A similar approach in establishing qualitative staffing needs is reported in Central African Republic.

Only three SSA countries (Cameroon, Zambia and Rwanda) report the utilization/existence of methodologies on planning and forecasting EMS personnel needs. The analysis of the reorganization and extension project of the Cameroon Emergency

Medical Care Service permits to conclude that the planning methodology uses exclusively the base number of hours required for one person to provide continuous coverage (i.e. ambulance, dispatch, etc.). This is substantiated by the absence of data availability and, consequently, by the impossibility to utilize a combination of multiple factors such as population served, squared kilometers covered and workload data.

Despite the availability and usability of international standards on EMS vehicle (by type) to population ratio, these are not widely applied among SSA countries. In Uganda, the national standards lay out one type B ambulance per 100.000 population and one type C ambulance per 2.000.000 population. In Rwanda, this ration is set as a performance target to be achieved in the framework of the 4th Health Sector Strategic Plan 2018-2024 and forecast one ambulance per 40.000 population.

# CHAPTER 3

# EMS Financing

# CHAPTER 3: EMS Financing

## I. Introduction and Economic Analysis

The primary objective of this chapter is to review of the financing arrangements being used for Emergency Medical Services (EMS) across sub-Saharan Africa (SSA), including policy frameworks, funding allocation, provider payments and insurance schemes.

The financing of EMS systems is analyzed with respect to characteristics of non-excludability and non-rivalry[71] and how EMS systems fit with the typology of goods. This should provide insight into the basic problems faced by EMS systems from a market failure perspective and discusses the general policy guidance that economic theory offers regarding EMS efficient financing.

EMS are effectively non-excludable. While technically possible, it is difficult to exclude all non-payers due to uncertain and exigent circumstances under which EMS services are provided. When a health emergency is in play, it does not make sense for a dispatcher or an EMS unit on the scene to spend time attempting to discern whether a patient is able to pay. Uncertainty also limits the ability of EMS providers to screen calls for urgency of need and exclude non-urgent calls, although modern priority dispatch systems do provide some guidance for determining which types of cases are more urgently in need of assistance.

An analysis of the free rider problem and the resulting financial challenges facing EMS systems should consider both the cost of delivering emergency medical services to individuals and the cost of maintaining system readiness to respond to calls on demand. The marginal cost of delivering EMS to an individual using existing response units includes gas, "wear and tear" on the vehicle, and medical supplies used in the care of the individual patient. This leaves the challenge of funding the costs of EMS system readiness, such as staffing, training, equipment and supplies, and administration. Because of the uncertainty over the timing of calls, system readiness will require a certain amount of unused capacity – times where ambulances and crews are available but are not responding to calls – and the challenge here is to balance between too little and too much of this unused capacity so that response times are within acceptable levels.

EMS services are rival at the point of congestion during periods of peak demand. That is, when all EMS units are busy, they cannot respond (or respond in a timely way) to additional calls. The degree to which EMS services are congested will vary depending on the balance of capacity and demand. The relative rivalry of EMS may be indicated by comparison with another public safety service - fire service. Fire protection services are considered non-rival because they are rarely called upon to respond to multiple fires at once and therefore generally have capacity available to respond to calls on demand. By contrast, multiple calls for EMS are common during periods of peak demand or during long transports from rural communities to distant inpatient facilities.

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[70] In economic theory, a good or service is said to be "rival" if it can only be used by one person at one time, while it is said to be non-rival if it can be used by multiple individuals at one time.

The marginal cost of adding the capacity needed to ensure that EMS can be delivered to an increased number of individuals during periods of peak demand is high. It includes additional vehicles and personnel available on demand.

Not all elements supporting EMS system readiness to respond are rival. At least two elements commonly identified in definitions of EMS are non-rival. For instance, serving another individual requires another EMS unit, but not additional expenditures on dispatch/communications infrastructure. While emergency medical services are rival, the guaranteed availability of EMS systems to respond to calls on demand is non-rival. In other words, having the system in place potentially benefits everyone, who may or may not need to call for EMS. Non-rival benefits of EMS systems are greater in the context of crisis and disasters. These magnify the non-rival benefits of an EMS system, assuming the system has the capacity to respond effectively.

Consequently, EMS systems may best be understood as a common good (rival and non-excludable) instead of public good (non-excludable and non-rival). As a common good, EMS systems confront two main challenges – financing and limiting overuse. Given the need for guaranteed availability of EMS system capacity to respond on demand, economic theory suggests that it would be most efficient to fund the EMS system "readiness" through taxation. EMS system capacity to respond to crisis and disasters and the positive externalities generated by EMS systems in the context of routine emergencies also raise the question of which level of Government should pay. By contrast, the benefits of ambulance transports that result from routine medical emergencies accrue primarily to individuals. Therefore, economic theory suggests that the marginal cost of EMS delivery may be financed most efficiently through user fees. However, the optimal balance of funding between taxes and user fees depends on several considerations, including the extent of the free rider problem. As the highest demand for EMS may often come from the populations with the least ability to pay, user fees to deter overuse may unfortunately deter legitimate use, leading to poorer health outcomes, and therefore require careful consideration in their application.

## II. EMS Financing Policy Framework

Health system investments in SSA have predominately focused on primary health care facilities to enable increased access to quality health services[72]. As such, there has been relatively less emphasis on improving hospital services in general and emergency services in particular. The chapter places a heavy emphasis on the analysis of devising rules and norms, as well as the enforcement of regulations to implement EMS financing policies. Generally, EMS financing reproduces the same characteristics as the EMS governance field: with few exceptions, the EMS systems of SSA countries lack a rigorous framework for regulation of EMS financing with proper roles and functions of financing within the health system. These limitations affect appropriate EMS financing across all aspects of service delivery.

Several countries – Cameroon, Rwanda, Senegal, Sierra Leone, Sudan, Tanzania, Zambia and Uganda – have vested exclusive authority with the

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[72] Ouma, P.O., Maina, J., Thuranira, P.N., et al. 2018. Access to emergency hospital care provided by the public sector in sub-Saharan Africa in 2015: a geocoded inventory and spatial analysis. Lancet Global Health, 6: e342-50.

Ministry of Health (and/or in collaboration with the Ministry of Finance) the development of EMS financing policy, while in most other States multiple agencies and authorities also have jurisdiction over EMS systems, as previously discussed.

The regulatory framework covers certain areas related to EMS financing (see Table 14). These provisions have a general character and do not offer clear mechanisms for mobilization of funds, distribution of financial risks, allocation and purchasing of services in the specific EMS context. Moreover, in most cases the respondents provided few details on the extent to which each of these areas were covered by the regulations and the specific content of these regulations.

Table 14 - EMS financing areas covered by regulations

| Financing areas | Countries |
| --- | --- |
| **Healthcare funds allocation** | Burkina Faso |
| *The process for allocating funds for EMS services* | Burundi |
| | Comoros |
| | Lesotho |
| | Liberia |
| | Madagascar |
| | Mauritania |
| | Niger |
| | Rwanda |
| | Senegal |
| | Sierra Leone |
| | Sudan |
| | Tanzania |
| | Togo |
| | Uganda |
| | Zambia |
| | Zimbabwe |
| **Coverage schemes** | Burundi |
| *How the costs of EMS services within the overall health system,* | Comoros |
| *including whether there are different approaches for different* | Liberia |
| *groups of patients or those with different conditions* | Madagascar |
| | Mauritania |
| | Niger |
| | Rwanda |
| | Senegal |
| | Sudan |
| | Uganda |
| | Zambia |
| | Zimbabwe |
| Examples of exemption policies include waiving the payment of | Burundi |
| *tariffs for different groups (e.g., children, the poor and vulnerable)* | Madagascar |
| *or for different conditions (e.g., MVAs, maternity cases)* | Rwanda |
| | Senegal |

| | |
|---|---|
| | Sudan |
| | Uganda |
| | Zimbabwe |
| **Tariffs** | Burundi |
| *How tariffs for EMS services are determined* | Madagascar |
| | Niger |
| | Rwanda |
| | Senegal |
| | Sudan |
| | Zimbabwe |
| **Fees for non-covered** | Burundi |
| *How fees for EMS services not covered by the national program* | Rwanda |
| *are determined* | Senegal |
| | Sudan |
| | Togo |
| | Uganda |
| | Zimbabwe |
| **Contracting health services** | Burundi |
| *Procedures for contracting private EMS providers* | Comoros |
| | Lesotho |
| | Rwanda |
| | Senegal |
| | Sudan |
| | Uganda |
| **Reimbursement** | Burundi |
| *Mechanisms and procedures for reimbursement, including the calculation* | Rwanda |
| *of the total amount owing and the amount covered by the patient* | Senegal |
| | Sudan |
| *Who oversees the payment organization (e.g., health insurance fund),* | Lesotho |
| *and what mechanisms are used* | Rwanda |
| | Senegal |
| | Sudan |
| **Incentivize providers for efficiency and quality care** | Burundi |
| *The existence of, and approaches used, to provide incentives to EMS* | Lesotho |
| *providers to improve their efficiency and/or quality of care* | Niger |
| | Rwanda |
| | Senegal |
| | Sudan |
| | Togo |
| | Uganda |
| **Provider control and audit** | Lesotho |
| *The existence of, and approaches used, to assert control over EMS* | Niger |
| *activities and perform appropriate financial and/or technical audits* | Rwanda |
| | Senegal |
| | Sudan |

For example, allocation of healthcare funds is identified by respondents as one area that is considered well-regulated yet is often not supported by appropriate provisions or mechanisms for allocating EMS funds (i.e. linked to the revenues or to expenditures) or lack transparent processes for how an EMS annual budget is planned. Relative to the challenges identified in EMS financing policy development, respective authorities have a clearer role in financing the EMS system, including its components (see Table 15). In most cases, funding for EMS system components is provided by authorities that have jurisdiction over EMS. However, these agencies do not impose standards or requirements on EMS. In Senegal, the Ministry of Finance has several roles and functions pursuant to the Law on EMS and sanitary transportation, including (i) establishing the tariffs for sanitary transportation, (ii) payments to EMS providers and (iii) approval of the Procedures Manual of Emergency Medical Care Service. Thus, the Emergency Medical Care Service is placed under financial supervision of the Ministry of Finance. By contrast, in Botswana there is no legislation that stipulates which authority leads EMS system financing. However, the Ministry of Health and Wellness finances some initiatives to provide EMS, but not from the EMS specific budget. Table 15 also shows differences in the responsibility for funding different parts of the EMS system, with service provision mostly the responsibility of the Ministry of Health or general government, while the Ministry of Public Works, the Ministry of Finance and external financiers being responsible for infrastructure and equipment expenditures in some countries.

Table 15 - Authority responsible for financing the EMS system

| Item to finance | Authority responsible | Countries |
| --- | --- | --- |
| Service provision | Ministry of Health | Botswana |
| | | Burundi |
| | | Cameroon |
| | | Chad |
| | | Comoros |
| | | Madagascar |
| | | Niger |
| | | Senegal |
| | | Sudan |
| | | Tanzania |
| | | Uganda |
| | | Zimbabwe |
| | | Zambia |
| | | Malawi |
| | Ministry of Internal Affairs | Sudan |
| | Ministry of Defense | Sudan |
| | Other Government/Unspecified | Togo |
| | | Burkina Faso |
| | | Congo Brazzaville |

Lesotho

**Infrastructure (facilities)** | Ministry of Health | Cameroon

Chad

Comoros

Madagascar

Niger

Senegal

Sudan

Tanzania

Uganda

Zimbabwe

Zambia

Malawi

Ministry of Public Works | Burundi

Uganda

Ministry of Internal Affairs | Sudan

Ministry of Defense | Sudan

Other Government/Unspecified | Togo

Burkina Faso

Congo Brazzaville

Lesotho

**Capital expenditures (equipment)** | Ministry of Health | Botswana

Cameroon

Chad

Comoros

Madagascar

Niger

Sudan

Tanzania

Uganda

Zimbabwe

Zambia

Ministry of Finance | Botswana

Uganda

| | |
|---|---|
| Ministry of Public Works | Burundi |
| Ministry of Internal Affairs | Sudan |
| Ministry of Defense | Sudan |
| Other Government/Unspecified | Senegal |
| | Togo |
| | Burkina Faso |
| | Congo Brazzaville |
| | Lesotho |
| Other (WB, other Development Partners, etc.) | Malawi |
| | Lesotho |
| | Senegal |

# III. EMS Financing[73]

In seven of the countries that responded, EMS is funded through central budget transfers to the Ministry of Health while in another seven the funding comes from a combination of resources provided to Ministry of Health, Government budget from other ministries, private sources and user payments. Two other countries fund EMS through a combination of the MOH budget and private sources; while a further two indicated that funding came from a combination of the MOH budget and user payments. One country specified that funding came from a combination of the MOH budget, the government budget from other ministries and user payments.

Most countries did not provide an estimate of the amount of donor funding received for EMS. For the five countries that did respond (Niger, Sierra Leone, Togo, Uganda and Zambia), Sierra Leone receiving the highest estimated donor funding for EMS ($4 million) while Niger received the lowest ($47,000). Other countries received between $278,000 and $700,000. In terms of cost of EMS services, again only five countries responded (Botswana, Rwanda, Sierra Leone, Uganda and Zambia. In absolute terms, Uganda had the highest estimated costs for EMS services while Rwanda estimated the lowest costs, but when adjusted for population, Botswana had the highest cost per capita ($1.306), while Zambia had the lowest ($0.050). These figures suggest that the funding for EMS is not a priority in most countries and that the level of population coverage is also quite low in most countries.

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[73] Limited information was provided regarding the financing of EMS. In some cases, this is due to the limited knowledge that the NR has on the subject matter and EMS not being considered as a specific line item within the larger health budget. However, additional information has been provided based on the authors' knowledge of a few countries that have developed systematic and organized funding for EMS (South Africa, Kenya, Namibia and Ghana).

Table 16 - Estimates of Cost of EMS services

| Country | Annual cost EMS services | Cost in USD | Cost per capita |
|---|---|---|---|
| Botswana | Botswana Pula 35,000,000 | $2,944,616 | $1.306 |
| Rwanda | Rwanda Fr 715,548,240 | $748,545 | $0.061 |
| Sierra Leone | US$5,000,000 | $5,000,000 | $0.654 |
| Uganda | US $10,000,000 | $10,000,000 | $0.061 |
| Zambia | Zambia KW 15,500,000 | $868,352 | $0.050 |

The questionnaire also asked about the sustainability of funding[74]. Only one country reported only a three-year commitment to funding (Niger), although Comoros indicated it had both a three-year commitment to funding and ad-hoc funding. Five countries (Sierra Leone, Zambia, Sudan, Rwanda, and Central Africa) have annual funding to meet budget requirements, while Burundi has annual funding to meet budget requirements plus ad-hoc funding. Three countries (Botswana, Liberia, and Zimbabwe) have ad-hoc funding based on EMS needs, and four countries (Cabo Verde, Mauritania, Madagascar, and Lesotho) stated that they have no sustainable budget for EMS. Only one country (Uganda) disclosed receiving funding for EMS through private not-for-profit organizations: US$500,000 from St John Ambulance, US$500,000 from Red Cross Society, US$1 million from Missionary Churches and US$300,000 from Malteser International.

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**Box 13 - World Bank funding for EMS/PECS development**

The World Bank has supported clients with the development of EMS/PECS through a range of lending and technical assistance products, providing a mix of financing solutions and strategic guidance designed to contribute to improving countries health sector outcomes. The following approaches offer examples of how States may consider engagements, either with the World Bank or other development partners, that can be tailored to their specific challenges and objectives.

Investment project financing

Stand-alone projects that focus primarily on the development and/or reconfiguration of EMS and/or PECS systems. Examples include:

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[74] Only 17 countries responded to the question concerning sustainability.

· Croatia - Development of Emergency Services and Investment Planning Project (P086669). The project supported an integrated, multi-pronged approach to institutional strengthening, along with the provision of key assets and technology upgrades, with the aim of (i) establishing an Institute for Emergency Medical Services, to guide EMS policy, set and monitor national guidelines and standards for EMS services; (ii) reorganizing pre-hospital EMS, to support the implementation of the national guidelines at the county level, upgrade pre-hospital EMS human, vehicle and equipment resources, and establish and integrate the EMS dispatch units with the national emergency system; (iii) integrate in-hospital EMS, to support the creation of integrated EMS departments in selected hospitals and upgrade the capacity of selected remote health centers to provide emergency services; and (iv) initiate an emergency-related telemedicine service delivery network to improve EMS delivery on selected islands and at other remote sites through the use of telemedicine technologies. The IBRD loan of US$28.3 million was implemented between 2008 – 2013.

· Uzbekistan Emergency Medical Services Project (P159544). Currently under implementation beginning in 20218, the on-going US$100 million project includes investments in (i) the EMS enabling environment, system management and quality improvement, including regulatory, governance, and operational management, behavior change communication on effective use of the EMS system, quality monitoring and analytics, and EMS system financing; (ii) dispatch, communications and information systems, including the development of integrated computer aided dispatch centers in each of the 12 regions plus Tashkent, communications equipment, and an integrated information system to support both operational and management decision-making and facilitate ongoing monitoring and evaluation; (iii) pre-hospital emergency care system improvement, including training and skills improvement and essential vehicles and equipment; and (iv) in-hospital emergency care system improvement, including training and skills improvement and essential equipment.

· World Bank support to EMS development has, in many cases, been through targeted interventions in the form of discreet components to larger health system strengthening (HSS) projects. Multiple projects in Eastern Europe (Bulgaria, Romania, Latvia, Lithuania) and the middle east (Iran) have focused on the inclusion of EMS development or improvement as a core element of health sector service delivery.

· Sierra Leone Post-Ebola health system strengthening project (P152359), which included the support for the establishment of nEMS (for more details on this project, see Chapter 6 case studies).

· Tamil Nadu Health System Reform Project (P166373). The project uses (DLIs). In this case, the Indian state of Tamil Nadu has taken upon itself to make investments toward "improved provision of trauma care services". Upon verification that confirms the development and implementation of a trauma registry, evidence of improvements in the proportion of trauma surgeries undertaken within six hours of the patient's admission, along with confirmed reductions in interfacility transfers, funds amount to US$17.7 million will be disbursed for payment of outputs that led to the improved outcome targets.

More recently, EMS development has been undertaken as components or activities of projects in the Transport Global Practice. With "post-crash response" a one of the five pillars of the global road safety agenda, support for EMS/PECS development is critical to reducing road trauma injuries and fatalities. Examples include on-going pilots in Tanzania as part of the Southern Africa Trade and Transport Facilitation Project (SATTFP) SOP1 (P120370), and in Malawi as part of the SATTFP SOP2 (P145566). Further details of the Malawi EMS pilot program are elaborated in Chapter 6.

Technical Assistance, Reimbursable Advisory Services

Technical assistance (TA) and reimbursable advisory services (RAS) are another potential avenue of World Bank engagement. There have been multiple RAS engagements in Saudi Arabia with the most recent one focusing on "Transfer, Acceptance, and Referral for Emergency Health Services". An in-depth analysis of Bulgaria's emergency health system was conducted as part of a larger HSS RAS engagement. TA activities include a review of road safety in Southern Africa (P172574), and a similar study looking at the socioeconomic impact of RTIs in Central Asia (P174749).

Knowledge Management supported by Donor Partners

With the support of the Global Road Safety Facility (GRSF), Nordic Development Fund, and Bloomberg Philanthropies, among other partnerships, numerous analytical studies and reports have been undertaken through publication of knowledge management products that focus on the importance of improving trauma care and reducing road deaths.

# IV. EMS Funding Allocations

In the majority of SSA countries, the legislative framework does not imply a secured funding mechanism for EMS. Few SSA countries report the existence of legal provisions regarding the mechanisms for allocating funds for EMS (see Figure 16). Comoros, Lesotho, Sierra Leone and Senegal use a target-budget/budget ceiling or a share from budget to allocate to EMS. At the same time, it was not clear from the survey response whether this mechanism is linked to revenues or to expenditures.

In Zambia, the annual budget planning for EMS is realized through the following pathway: budget committee budget hearing call circular Parliamentary debate and approval. In Rwanda, the EMS budget planning process is led by the Directorate General of Planning, Health Financing and Information Systems based on a specific Standard Operating Procedure (SOP) on Annual Plan and Budget. The EMS Division establishes priority actions and estimated budget in the field of EMS that are included in the MoH Annual Action Plan. Finally, the EMS system receives a share from the ceiling budget allocated to the Ministry of Health. A similar process of establishing annual budget for EMS is reported in Niger. By contrast, Botswana does not have an EMS specific budget. Funding of EMS-related activities is ad-hoc based on current needs and is allocated and approved by a panel from the MOH accounts and finance office. Overall, the EMS system in Botswana does not receive an adequate budget mainly due to the lack of integration into health system and there is no policy to guide the allocation of the budget.

Whilst SSA countries mention crisis and disaster preparedness and response within the responsibilities of EMS system, survey responses suggest that only Comoros and Lesotho have legal provisions in place stipulating that the EMS system shall receive funds for crisis and disaster management. In Comoros, these are established by the Law on public finances. It is not clear if the mechanism in place assures a special budget allocated to crisis and disaster preparedness or a specific reserve budget to be promptly mobilized in the event of crisis/disaster. Further, survey responses suggest that most SSA countries likely assume that the Government has mechanisms to promptly mobilize state funds according to needs in all "crises".

It is important to highlight that most NRs reported that their national laws guarantee provision free of charge of emergency medical services to households and individuals[75] (see Figure 16). However, there is dissonance between this aspect and those related to inclusion of EMS in the state guaranteed funding envelope (e.g. Botswana, Burundi, Comoros, Congo Brazzaville, Gabon, Lesotho, Madagascar, Mauritania, Sudan, Cameroon, Liberia and Zambia). This discrepancy is rooted in the priority that states (ministries of finance and/or health) assign to EMS, and the feeling in many countries that EMS services are a luxury that countries develop as they become richer, rather than an essential element of a functional health care system.

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[75] Botswana, Central African Republic, Comoros, Congo Brazzaville, Lesotho, Liberia, Madagascar, Malawi, Mauritania, Niger, Sudan, Uganda, Zambia, Zimbabwe, Sierra Leone

Figure 17 - Countries Guaranteeing Free-of-Charge Provision of Emergency Care



Free of charge provision of EMS across SSA countries
☐ Free of charge provision of EMS to households and individuals
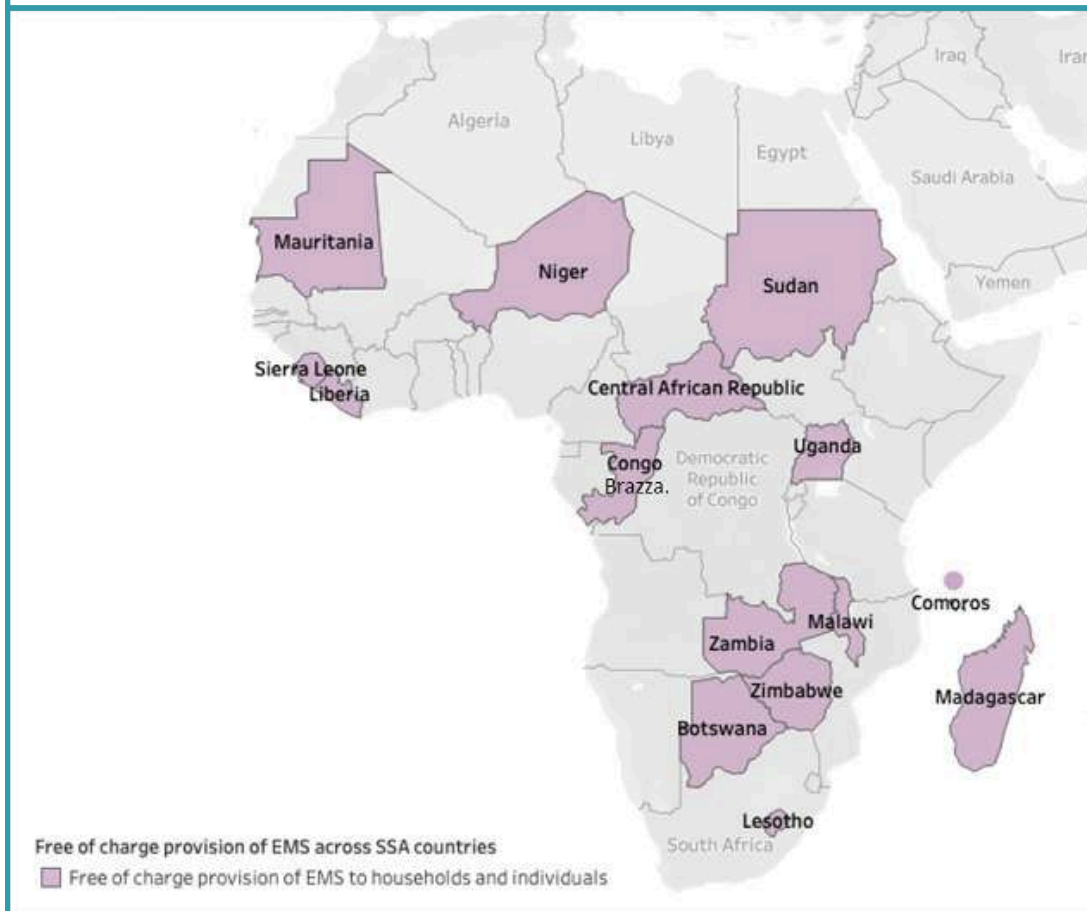
Weaknesses in the attribution of criticality is confirmed to a degree by the five categories that were identified in by different countries that are covered or subsidized by the Government, including: Children aged 0-5 years (Senegal); Category 1 of the Ubudehe Program[76] (Rwanda); Bamako Initiative (Central African Republic); indigent persons (Burundi); and aeromedical evacuation (Botswana). Further evidence of the perceived lack of criticality in terms of geographic access is that fact that, in Botswana, emergency medical services are only available publicly at eight centers (i.e. Lobatse, Gaborone, Mahalapye, Palapye, Selibe-Phikwe, Francistown, Maun and

Kasane) covering just 22 percent of the population, although the services are provided to population free of charge. In areas covered by private operators, EMS can be accessed using direct payments or under medical coverage schemes.

SSA countries with a formal EMS system often rely on primary sources other than the state budget, thus incorporating at least some element of user charging into the funding mix (see Table 17). By contrast, countries with informal EMS systems – Togo, Cabo Verde, etc., and where EMS is provided mainly by private operators, are limited to direct payments from households and individuals.

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[76] Eligible beneficiaries for the "Ubudehe" program are identified through a community based social mapping exercise that classifies households into 6 well-being groups

As with all health services, there are strengths and weaknesses to the concept of incorporating user fees into the overall financing approach for EMS. On the plus side, this provides an alternative source of funding that may be important in countries with constrained budgets. However, even in well-established EMS systems, the contribution of user fees to the overall funding of the system tends to be relatively low, since the fees still need to be affordable to the general public. In Australia, for example, out-of-pocket payments for ambulances services represent just 18 percent of the total cost, with another eight percent being paid by private insurers. Similarly, the Toronto Paramedic Service in Canada charges C$45 per trip, which is less than 20 percent of the estimated average cost of C$240 per trip. User fees may also be seen as a means to deter over-use, although it may be argued that especially in emergency situations, the patient (or bystanders) are not in a good position to determine whether an ambulance is needed and it may be more prudent to err on the side of caution. On the negative side, there is a high potential that user fees may deter legitimate emergency calls, potentially resulting in worse clinical outcomes and higher costs to either individuals or society. On balance, there appears to be a consensus that some fees may be needed to generate revenue, but that they need to be kept relatively modest to not deter legitimate demand.

Table 17 - Other financing sources[77]

| Financing source | Countries |
| --- | --- |
| Direct payments | Botswana |
| | Rwanda |
| | Togo |
| | Cabo Verde |
| | Cameroon |
| Coverage schemes | Botswana |
| | Cameroon |
| Health insurance (public and private) | Rwanda |
| | Senegal |
| | Uganda |
| Imputation (specific allocation) | Senegal |

[77] Namibia MVA Fund Annual Report, 2018.

> ### Box 14 - Case Study: Namibia Motor Vehicle Accident (MVA) Fund
>
> Several countries in southern Africa have motor vehicle accident funds, which are used in part to finance the cost of EMS and in-hospital emergency care. These are at varying levels of financial viability and an analysis of the available data showed that the arrangements in Namibia appeared to be performing well. Though Namibia did not participate in the survey, their experience provides a useful case study of a well-functioning scheme of this type.
>
> Created in 2007, the Namibia MVA Fund was created "to design, promote and implement crash and injury prevention measures, provide assistance and benefits to all people injured and the dependents of those killed in road crashes. All people injured in motor vehicle crashes, regardless of who caused the crash, receive fair and reasonable benefits (subject to some limitations and exclusions), while such payments are issued in accordance with administrative law principles."[75]
>
> In 2018, the MVA fund had revenue equivalent to $48 million (or just under $20 per capita) with 88 percent of the revenue coming from the fuel levy, 11 percent from investments and the balance from other sources. Direct claims consumed 57.2 percent of total revenue, with payments in 2018 amounting to 47.7 percent and 9.5 percent held in reserve against future claims expenses. For current year payments, almost 55 percent went towards hospital and medical expenses, close to 30 percent for loss of income or support, and 13.6 percent for general damages and injuries. There were also minor amounts for funeral expenses and legal settlements. About 1.2 percent of revenue went towards accident and injury prevention, medical management and public education, while 25 percent was spent on administration. The surplus for the year was 17 percent of revenue, which is a bit lower than previous years.

# V. EMS Provider Payment

Like other fiduciary aspects of EMS systems across SSA, provider payment modalities and mechanisms are hindered by the overall weak regulatory frameworks in place. In EMS systems funded directly from Government or MoH budget, the provider payment systems are rudimentary and rely on simplistic formulae using number and/or type of delivered services, catchment population and individual service.

Burundi, Comoros, Sudan, Rwanda, Cameroon and Senegal were the only respondents to provide

information on their respectively methodologies for establishing tariffs, insurance premiums, and other modalities for EMS provision. In Burundi, there is a pricing system for care set up by the Ministry of Public Health, while Comoros indicated that there was a normative framework which specifies pricing methodologies and that it was not common for the public and private sectors but provided no further details. Rwanda indicated that tariffs are developed by the Health Financing Department of the Ministry of Health for EMS provided in public health facilities, and that there is no private EMS but there is a tariff for private health facilities including some EMS-related services. Two countries (Senegal and Sudan) report common tariffs for both public and private EMS providers. In Senegal, tariffs for medical transportation (amounts that EMS operators can charge patients) are established by joint order of the Minister of Finance, the Minister of Health and the Minister of Commerce. Failure to respect the list of tariffs may result in the withdrawal of authorization. Cameroon separately regulates the tariffs for private medical transportation. These are established jointly by the Minister of Health and the Minister of Finance.

A purchaser-provider relationship in EMS delivery is present in SSA countries that implemented a regulatory framework in the field of public procurement and/or instituted a purchasing agency in the health system – state or private insurer, etc. In Rwanda, EMS purchasing follows the public procurement process from the technical specifications, advertisement of the tender, notification, evaluation, delivery and acceptance reporting. In Uganda, EMS purchasing follows the National Public Procurement and Disposal Assets Act and regulations (i.e. PPDA Act 2003, PPDA regulations 2006). However, two SSA countries (Lesotho and Sudan) report the existence of purchaser-provider relationships in EMS procurement separately from the two conditions mentioned above.

Generally, the payment process is not linked to or does not include EMS provider oversight, control and penalties to account EMS providers' poor performance and non-standard care. Only three SSA countries (Rwanda, Sierra Leone and Senegal) report such procedures, but these are non-EMS specific.

# VI. EMS Insurance Schemes

Twelve countries provided information regarding insurance schemes for EMS.

- Senegal, Mauritania, Botswana, Comoros, Burundi, Rwanda and Sierra Leone reported compulsory, as well as voluntary and supplementary insurance schemes, while Uganda and Cameroon had voluntary and supplementary insurance schemes. Niger, Zambia and Sudan reported only voluntary insurance schemes.

- Insurance schemes in Mauritania and Sierra Leone are provided by the Government or Ministry of Health.

- Zambia, Rwanda, Central Africa all have insurance schemes provided by private organizations, while Botswana and Comoros have insurance schemes provided by a combination of Government/Ministry of Health and private organizations.

- Niger, Senegal, Burundi, Zimbabwe, and Burkina Faso have a combination of insurance schemes provided by the Government or Ministry of Health, private organizations, and employers.

- Burundi, Rwanda, Sudan, Botswana, Zimbabwe, Zambia and Senegal offer a combination of individuals, ministry of health, government, private organizations and employers as institutions that made payments of the insurance premiums.

- Sierra Leone only had private organization or employers make payments, while Comoros has a combination of Ministry of Health, government and private organizations / employers and Uganda and Cameroon have a combination of individuals, private organizations and employers. Uganda has a combination of insurance schemes provided by private organizations and employers. Madagascar has a combination of insurance schemes provided by the Government or Ministry of Health and employers.

- EMS is provided by the Government of Lesotho without the use of any insurance.

# CHAPTER 4

# EMS Training

# CHAPTER 4: EMS Training

## I. Introduction

The following chapter aims to produce a comprehensive review of the regional standards and approaches undertaken to develop knowledge and skills for Emergency Medical Services (EMS) staff across Sub-Saharan Africa (SSA), including the training accreditation and licensing of medical first responders, pre-hospital care paramedics and emergency care nurses and physicians. It also looks to compile a regional snapshot of training institutions that currently provide either pre-service or in-service courses to staff and technicians.

The chapter provides an overview on authorization and regulations related to EMS training standards and practice that may reasonably guide development of appropriate policy recommendations. However, it does not consider the advantages and disadvantages for the EMS training models adopted by SSA countries, does not take a position on whether regulatory approach should be applied, or measure the degree of EMS training standards implementation and the success or failure of implementing various EMS training policies.

The chapter provides a review and evaluation of regulations and standards in six key areas of the EMS training: EMS training regulation and organization, EMS physicians training, EMS nurses and other professionals training, EMS first responders training, EMS professionals practice authorization and financing for EMS training.

## II. EMS Training Regulation and Organization

Bodies that recognize and regulate EMS specialty training specifically include professional authorities, universities and state agencies. Except for a few SSA countries[78] most lack an authority responsible for regulating quality or standards of the EMS education system, including course authorization, curricula review, licensing of instructors, or specialty accreditation. In most SSA countries, the content of EMS training programs is not driven by national minimum guidelines and competencies for EMS curricula. Moreover, the authors did not find documents and/or policies on standard EMS scope of practice that clearly define standard levels of EMS providers, training and qualifications required to attain those levels, and delineate all knowledge, skills, and competencies required to practice at a given level.

In Central African Republic, the responsibility for the regulation of EMS training, as established by the current regulations, is attributed to the Faculty of Health Sciences of the University of Bangui, but currently no specific regulations have been enacted in this regard. The authorization

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[78] Botswana, Zimbabwe, Tanzania, Liberia, Zambia delegate authority to the Health Professionals Council

practices and procedures for the different EMS training programs are not comprehensive and are limited to: (a) the availability of a lecturer or specialist in the field, and (b) development of a training program approved by the faculty.

Similarly, in Sudan, the EMS training programs are authorized if the following criteria are met – existence of training materials, lecturer qualification, and regular training schedule.

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**Box 15 - Training Regulation in Zimbabwe**

In Zimbabwe, the Allied Health Practitioners Council has power and functions in the field of EMS training, namely: (a) to regulate, control and supervise all matters affecting the training of persons and exercise of professions; (b) to promote liaison in the field of training, both in Zimbabwe and elsewhere, and to monitor, enforce and improve the standards of such training in Zimbabwe; and (c) to advise the Ministry of Health on any matter affecting the profession or calling off any allied health practitioner.

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In Zambia, all educational programs must first be approved by the Health Professions Council (HPC) prior to any institution delivering EMS professionals training. The approval process consists of (i) submission of specific documentation and (ii) physical inspection. There are eight standards that are assessed, namely – institutional setting and governance, curriculum development and implementation, admission criteria and student welfare, faculty management and supervision, educational resources, health and safety, boarding facilities, quality improvement. HPC does not provide admission plans for EMS education institutions, but each training institution develops admission criteria and plans which should be in line with the Guidelines for approval of training programs. Legal requirements establish that, at least every five years from the date of approval, each EMS training program must be reviewed, including the performance of the graduates of the program. HPC withdraws the approval of a training program, should it determine that this

no longer meets the requirements established by the Health Professions Law, or the graduates of the training program consistently fail to meet the standards. Additionally, the General Nursing Council regulates exclusively the nursing education through the development of curricula, registration of suitability qualified nursing colleges to offer specified training programs, monitoring of curricula implementation, as well as conducting final qualifying examinations.

In Botswana, in collaboration with the Botswana Qualification Authority (BQA), the HPC started implementing a mechanism for regulating EMS training. Prior to this, BQA accredited EMS training without the involvement of the Botswana HPC (BHPC). The BHPC authority and responsibility for EMS training, granted by the Botswana Health Professions Act of 2001, derives from the objective of promoting high standards of professional training, proficiency, professional conduct and etiquette. At the same time, according to the legislation in force, the

Ministry of Health could, after consultation with BHPC, make regulations for any matter which in terms of Health Professions Act is required or permitted to be prescribed and, generally, for the better carrying out of the provisions of the Act, including (a) the list of recognized medical schools or training health institutions and the requisite qualifications; (b) the procedure of registration of practitioners; (c) the manner and requirements to sit for examinations; (d) the licensing requirements of private practice; (e) fees which may be charged by any person registered to practice; (f) the manner in which professional boards operate. Additionally, after consultation with the BHPC, the Ministry of Health may, by order, amend Parts I (Medical, Dental and Pharmacy Professions) and II (Allied Health Professions) and III (Associated Health Professions) of the Schedule B Professions. At the same time, BHPC does not establish admissions plans for EMS. As reported by NR, currently the accreditation and monitoring process of the training health institutions is not fully enforced and effective due to human resources capacity limitations.

In Tanzania, under the Nursing and Midwifery Law (2010), a Nursing and Midwifery Council (TNMC) has been established, that works as the regulatory and control body of nursing and midwifery education and practice. TNMC has exclusive powers to register and license nursing schools. Upon receipt of an application for registration of a school for nursing or midwifery, the Council shall, if satisfied that the prescribed condition of establishing such a school has been or shall be complied with, either register the school, by issuing a certificate of registration, or state the condition upon which that school shall be registered. The application for registration of a nursing or midwifery school includes: (a) a narrative description of the organizational structure of the program; (b) master plan of the curriculum, indicating the sequence of both nursing and non-nursing courses, as well as

prerequisites and core courses; (c) evidence of learning resource to implement and maintain the program; (d) student policies related to conditions for admission, progression and graduation, and total program evaluation; (e) lecturers, teachers or nurse tutors with description of their qualifications; (f) the examination and assessment procedure and processes, etc. Additionally, each nursing school is required to identify approved hospitals for practical experience for students in accordance with the curriculum. For purposes of nursing or midwifery training the identified hospital shall first be approved by TNMC.

A similar governance model in EMS training was approached by Liberia. The Liberian Board for Nursing and Midwifery (LBNM) is an autonomous agency which operates based on an amendment of the Act of Legislature, and which is accountable to the Government of Liberia. It has exclusive power and authority to regulate and monitor the nursing and midwifery practice and training. LBNM primary functions, as set out in the Nurse Practice Act (2016), are in the field of establishment and accreditation of nursing and midwifery training institutions, curriculum development and harmonization, accreditation of basic and post-basic training programs, and licensing of nurses. However, applied practices and procedures are not comprehensive and do not reproduce international standards in the field. As an example, Liberia has no internationally accredited graduate medical education programs (e.g. West African College of Physicians and Surgeons).

By contrast, in Rwanda, the regulation of the EMS education system is done by the Ministry of Education through the Higher Education Council (HEC). The primary mission of HEC is the maintenance of quality assurance in the provision of higher education to ensure that higher education institutions develop programs that (a) meet the demands of the labor market, and (b) train specialists capable to contribute to

the economy sectors development, as well as society at large. According to the legislation in force, the process of accrediting higher education institutions is set by the Ministry of Higher Education. The conditions to be fulfilled concern any training program, not specifically EMS. Thus, any individual or legal person, wishing to establish an education institution, confer academic awards, and change the academic degree program, shall address a written application thereof to the Ministry of Higher Education. The application is accompanied by: (a) the denomination of the education institution, its headquarters, its category and the teaching disciplines; (b) the mission and objectives of the institution; (c) a detailed document specifying the assets and financial resources of the institution; (d) a document showing the organization and administration of the institution; (e) the details on the system of admission of students and on the teaching programs offered by the institution; (f) a detailed document specifying the nature of the buildings and equipment related to the type of training to be offered; (g) a document specifying the size of the planned personnel, its category and the classification of its posts; (h) a detailed document describing existing or planned infrastructure; (i) a document showing the functional and financial management control system of the institution; (j) the certificate of full identity of the founder of the education institution and the certificate of legal personality, if it is a legal person. The Ministry of Higher Education decides based on the report developed by the National Council for Higher Education. Where the application is accepted, the Ministry of Higher Education signs an operating agreement with the applicant. The institution's operating agreement is valid for at least three years. Any higher education institution that shall have been granted an operating approval and which wishes to upgrade its educational levels, to establish new faculties, new research centers or schools, signs an additional agreement with the Ministry of Higher Education.

There is a certain coordination at the national level to ensure that educational standards and scope of practice of EM nurses are at an acceptable and locally applicable level in Rwanda. The standards in nursing training programs for enrolled and registered nurses are set by the National Council for Nurses and Midwives and further approved jointly with the Higher Education Council.

Similarly, in Uganda, the authorization/accreditation of EMS education institutions is done by the Ministry of Education and Sports. The practices and procedures for the different education/training programs are stipulated in the guide approved by the National Council of Higher Education. However, the country reports the involvement of universities and other higher health education institutions in regulating the EMS training.

In Cameroon, a governance intervention has been established, which is aimed at addressing the problem of poor stakeholder coordination for human resources for health (HRH), including training of professionals. The Ministry of Health instituted a national multisectoral coordinating committee which acted as the umbrella organization for developing HRH, raising awareness of issues surrounding HRH and high-level HRH advocacy. It also managed the HRH technical working group, an HRH national observatory and a multidisciplinary HRH research group. The members of the committee include 11 ministerial officers and representatives of development partners (2 members), the private sector (1), decentralized local and regional authorities (1), civil society organizations (1), chambers of commerce (1), professional associations (4), trade unions (2), medical and nursing schools (2) and patient associations (1), plus other experts on an as-needed basis. The committee routinely meets twice a year and ad-hoc at other times. The HRH technical working group is responsible for the development of HRH policies and strategic

plans and for the subsequent monitoring of their implementation. It meets four times per year to respond to the central HRH issues. Meetings of both the coordinating committee and the technical working group follow established agendas and focus on specific needs. This policy intervention may provide lessons to be learnt and best practices that can be extrapolated to other SSA countries.

The training required to work in EMS varies greatly across SSA countries. Some SSA countries require EMS physicians, both out of-hospital and in-hospital, to be a specialist in at least one or more medical areas (e.g. intensive care, anesthesiology, emergency surgery, etc.). Formal and informal training requirements for non-specialized and specialized professionals involved in the EMS system also vary significantly.

Remarkable differences in the formal education requirements for different professional specialties were found across countries and specialties

(see Table 18). Emergency nurses and EMT Basic were the most likely to require formal education, while EMS managers were least likely to do so. On the other hand, based on the information reported, Lesotho and Zimbabwe were most likely to require formal education for EMS-related professions in their country, while Congo Brazzaville and Sierra Leone were least likely to have formal education requirements.

For example, in Lesotho, some emergency departments are managed exclusively by specialists in emergency surgery who are registered by the Medical Council. Congo Brazzaville, in the absence of a registered EM specialty, requires that the EMS physician be a specialist in internal medicine, anesthesiology or intensive care. Similarly, EMS medium-level medical personnel are required to be nurse anesthetist and/or graduate nurse. In Tanzania, all nurses working in the EMS system must be registered under the Nursing and Midwifery Act of 2010.

Table 18 - Formal education requirements for key staff in the EMS system (1 = yes)

| | First Responder | EMT Basic | EMT Intermediate | EMT Advanced or Paramedic | Emergency Nurse | Emergency FR | PSAP personnel | EOC personnel | EMS manager | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Botswana | | 1 | 1 | 1 | 1 | | | | | | 4 |
| Burkina Faso | | | | | 1 | | | | | | 1 |
| Cape Verde | | | | | 1 | | | | | 1 | 2 |
| Central Afr. Rep. | | 1 | | 1 | 1 | | 1 | | | | 4 |
| Congo Brazza. | | | | | | | | | | 1 | 1 |
| Lesotho | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | 1 | | 8 |
| Liberia | 1 | 1 | 1 | | | | 1 | | | 1 | 5 |
| Madagascar | | | | | 1 | | 1 | 1 | | | 3 |
| Niger | 1 | | | | 1 | | 1 | | | 1 | 4 |
| Rwanda | | 1 | | 1 | | | 1 | | | | 3 |
| Senegal | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 7 |
| Sierra Leone | | 1 | | | | | | | | | 1 |
| Sudan | 1 | 1 | | 1 | 1 | 1 | | 1 | | | 6 |
| Tanzania | | | | | 1 | | | | | 1 | 2 |
| Uganda | 1 | 1 | | 1 | 1 | 1 | | 1 | | | 6 |
| Zambia | 1 | | 1 | 1 | 1 | | | | | | 4 |
| Zimbabwe | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | | 8 |
| Total | 7 | 9 | 6 | 8 | 13 | 5 | 7 | 6 | 3 | 5 | |

As opposed to providing in-service training for EMS staff already hired, nearly all SSA countries require and deliver pre-service EMS education for professionals at the university level[79] or through medical colleges or nursing schools[80], as tertiary institutions. Graduate and postgraduate education for nurses is offered by universities, namely by faculties of nursing and/or medicine.

Several SSA countries report training abroad of EMS professionals (mainly physicians) (Niger, Cabo Verde, etc.) or formal training by non-education institutions such as the Red Cross/Red Crescent Movement in Central African Republic, Congo Brazzaville, Gabon, Niger, Uganda, and Zimbabwe and Médecins Sans Frontières (Liberia, etc.).

Emergency Medicine (EM) is officially recognized and/or accredited as a medical specialty in a majority of SSA countries (see Figure 17). The official registration as a medical specialty determines the attribution of a unique field of action, both within the inpatient facility and in the community, a defined body of knowledge and associated competencies, and a rigorous training program. Unfortunately, whether EM is granted primary medical specialty status or is developed as a sub-specialty cannot be discerned from the survey responses.

[79] Burkina Faso, Cameroon, Central African Republic, Congo Brazzaville, Gabon, Madagascar, Niger, Senegal, Sierra Leone, Tanzania, Togo, Uganda, Zimbabwe, Cabo Verde
[80] Botswana, Cameroon, Congo Brazzaville, Lesotho, Malawi, Senegal, Sierra Leone, Sudan, Tanzania, Uganda, Zambia, Zimbabwe, Liberia

Figure 18 - Countries Recognizing Emergency Medicine (EM) as a Specialty
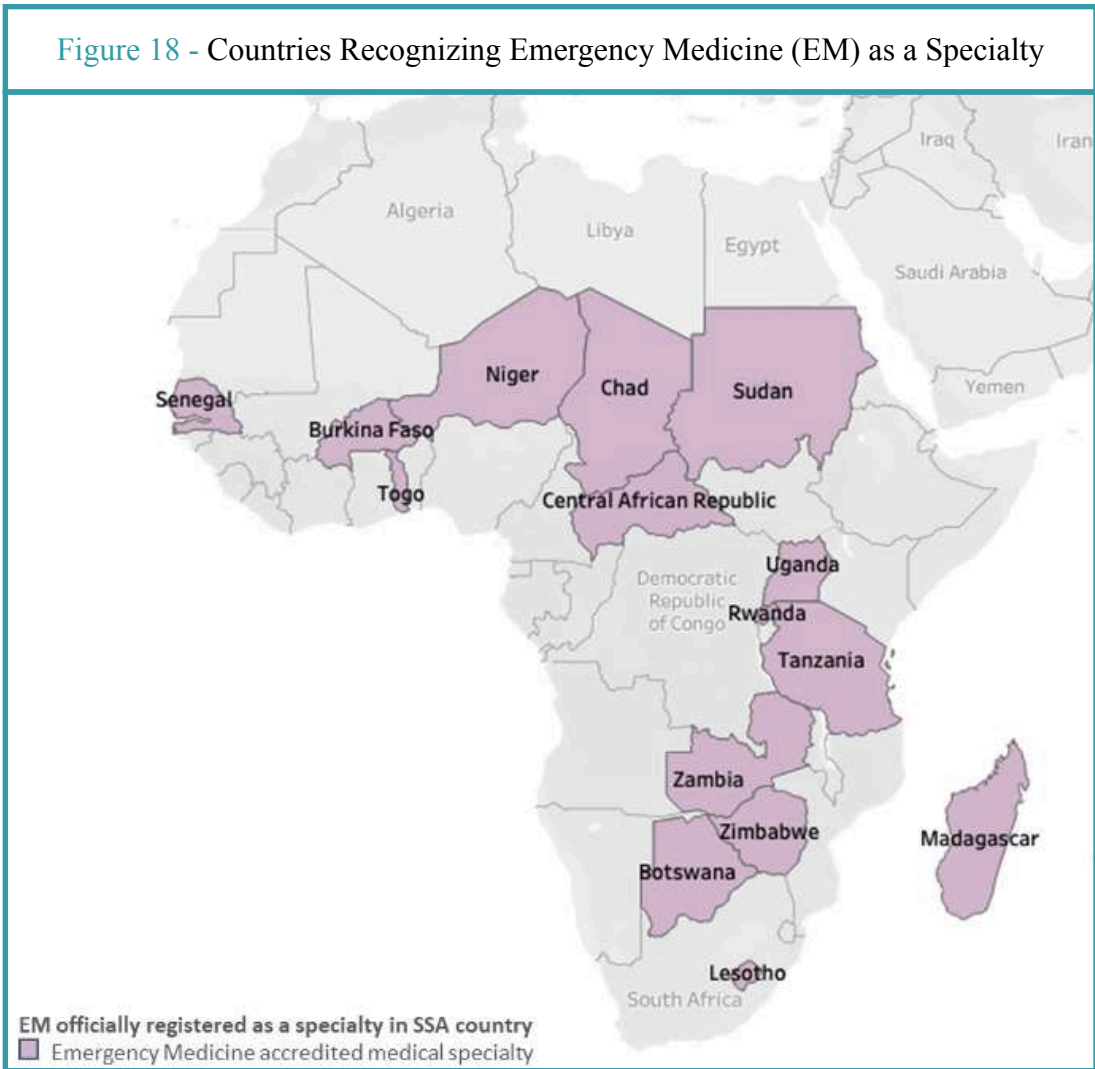
The survey response show differences across SSA between the recognition of EM as a medical specialty and the availability or focus of postgraduate training in emergency medicine. Among the countries that recognize EM as an accredited specialty, postgraduate training is available in Botswana at the University of Botswana in emergency medicine; in Rwanda the program at the University of Rwanda, College of Medicine and Health Sciences covers both Emergency Medicine and Critical Care, and neither Zambia nor Central African Republic have training programs for emergency physicians, even though EM is recognized as a specialty. In Zimbabwe, according to the regulations in force, the EM specialty is registered by the Medical and Dental Practitioners Council, but no mention is made of a specific training program. By contrast, in Liberia, the EM specialization is neither formalized nor accredited.

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**Box 16 - Zambia Emergency Medicine Specialty and Training**

In Zambia, EM is a recognized medical specialty at Master of Medicine level, and the Health Professions Law mandates the Health Professions Council (HPC) to record in the specialists' register medical doctors with Masters in EM or equivalent. However, no training institutions have been approved to offer this program in Zambia, and all registered emergency medical specialists are trained abroad.

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# III. Emergency Medicine Physician Training

Postgraduate EM training in SSA countries ranges from the absence of established training of EM physicians to well-established training programs of EMS physicians and medium-level medical professionals offered by government agencies, universities, private training institutions or as part of continuing professional education. In recent years, several SSA countries have sought to develop and implement postgraduate education in emergency medicine, offering two-, three- and four-year programs (see Table 19). In Cameroon, for example, the medical student educational program is a 7-year curriculum including a 1-year research activity at a college. For emergency medicine, a 2-year special training program is offered, but it is not recognized as a certified residency program. The postgraduate EM training was organized as a Master of Medicine (MMed) program.

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**Box 17 - Twinning partnerships for development of EM training programs**

In a majority of cases, the postgraduate EM training programs were developed based on twinning partnerships (i.e. international peer-to-peer collaboration between academic institutions, healthcare facilities, professional authorities and/or community organizations with local political support) to build technologically and economically appropriate solutions to problems in the host country. The twinning partnership model appears to have been chosen for establishing an academic EM training program because its principles aligned with partners' values, and previous global health partnerships had achieved positive outcomes when adapting it to similar resource-limited settings. This model differs from traditional professional exchanges or global health partnerships in that it involves all partners in the decision-making process, emphasizes long-term relationships, builds collective efficacy, requires significant volunteer time from all partners, and values the experience and knowledge of all. The twinning partnerships supported the development of Emergency Medicine as a single medical specialty.

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Table 19 - EM postgraduate training across SSA countries

| Length | Training | Country |
| --- | --- | --- |
| **2-year** | Residency Program | Cameroon |
| | PGD Course (as a supra-specialty) | Rwanda |
| **3-year** | Master of Medicine Program | Uganda |
| | | Tanzania |
| | Residency Program | Sudan |
| | | Madagascar |
| **4-year** | Master of Medicine Program | Rwanda |
| | | Zambia |
| | | Botswana |

The duration of a postgraduate EMS training program(MMedandsupra-specialization)ismainly determined by normative judgments, compared to the undergraduate EMS training program which is mainly determined by the length of time needed to acquire the necessary competencies.

The Ministry of Health of Rwanda, as part of the HRH Strategic Plan 2011–2016, instituted the Emergency Medicine Sub-Committee which decided to create a two-tiered EMS postgraduate training system. The first tier consisted of a 2-year, part-time postgraduate diploma (PGD) course in Emergency and Critical Care Medicine. The second tier represented a Master of Medicine in EM, structured similarly to US-based emergency medicine residency programs. Further, in the framework of the Human Resources for Health Program 2013-2019, the Ministry of Health decided to extend the EM program duration from 3 to 4 years to more gradually replace visiting faculty with Rwandan faculty. Moreover, the Ministry of Health considered adopting a similar approach for nursing and midwifery graduates, as well.

Similarly, the Sudanese Ministry of Health and the Ministry of Human Resources and Labor, recognized, in 2010, the need for the Emergency Medicine as a sub-specialty. Consequently, the Medical Specialization Board, authority responsible for almost all postgraduate trainings in Sudan, established the EM board. The Emergency Medicine residency program, which was approved in 2011, consisted of 2 years of EM training in Sudan, followed by 2 years at an international destination. Currently, the NRs report a 3-year residency program in Emergency Medicine.

The same approach is ascertained in Botswana and Uganda. Princess Marina and University of Town academic hospitals are used as training sites. The MMed program was modeled on the South African program for a number of reasons - (a) both countries face a similar burden of disease and have comparable resource constraints; (b) geographical proximity; and (c) EM training in South Africa is run through universities as a Master of Medicine 4-year program, similar to the UB model. Accreditation of the UB EM

Master's Program by the Colleges of Medicine of South Africa represents another priority reason. Additionally, the College of Emergency Medicine of South Africa and the Emergency Medicine Society of South Africa are very supportive of efforts to develop Emergency Medicine in the region. In Uganda, the Master Program in EM was introduced in 2017 at Mbarara University of Science and Technology, in the framework of a twinning partnership with GEC and UIC Center for Global Health. The courses are offered at Nyakibare and Masaka Hospitals as training sites. Additionally, Makerere University has been accredited by the National Council for Higher Education, in 2018, to implement a three-year EM Master's Program.

In Tanzania, the EM training program is fully integrated into the Muhimbili University of Health and Allied Sciences (MUHAS) and Muhimbili National Hospital (MNH). The MNH Emergency Center serves as the command center for major incidents across the country. The professional degrees on Emergency Medicine and Critical Care offered by MUHAS are the following – Doctor of Medicine (Emergency Medicine Rotation), Master of Medicine in Emergency Medicine, Master of Science in Critical Care, Bachelor of Science in Nursing (Emergency Medicine Rotation).

A key observation of the survey results reflects the reality that SSA countries that implemented an EM postgraduate training in the framework of twinning partnerships developed core curriculum based on the Anglo-American model – hospital-based physicians (Emergency Department) to become emergency medicine specialists (see example from Rwanda in Table 20). This is likely due to the greater propensity of Anglo-American medical schools to participate in such twinning relationships. The fitting and adaptation of the curriculum to local disease profiles, settings and resources was reported in all cases. Additionally, the process of curriculum adaptation enabled universities and responsible authorities to accelerate the implementation of the training program and to make it relevant to the local context (i.e. lectures, examinations, etc.). It should be noted, however, that postgraduate medical education was evolving over time and differed across Anglo-American countries, so that the model a particular country wound up with depended a great deal on the timing of the introduction of the model and the country which participated in the twinning arrangement.

Table 20 - Master of Medicine in Emergency Medicine Curriculum
(Rwanda, HRH Strategic Plan 2011-2016)

| PGD, Y1 | PGD, Y1 | MMed, Y1 | MMed, Y2 | MMed, Y3 |
|---|---|---|---|---|
| EM (4) | EM (2) | EM (6) | EM (6) | EM (6) |
| Gen. Surgery (1) | Obs/Gyn (1) | Pediatric ICU (1) | Neonatal ICU (1) | Teaching (1) |
| Anesthesia (1) | Critical Care (1) | Medical ICU (1) | Pediatric EM (1) | District hospital rotation (2) |
| Annual Leave (1) | Orthopedics/ Pediatric EM (1) | Pediatric EM (1) | Foreign EM rotation (1) | Pediatric EM (2) |
| | Annual Leave (1) | Ultrasound (1) EMS (1) Annual Leave (1) | Annual Leave (1) | Thesis (1) Annual Leave (1) |

At the same time, there did not appear to be an EM curriculum that was comprehensive and adapted to local settings and resources in SSA countries that use the Franco-German model – physician-based pre-hospital care (e.g., Cameroon, Senegal, Madagascar). In Cameroon, the implementation of a training curriculum to strengthen the competence of emergency physicians remains an urgent task for providing reliable emergency care.

Several SSA countries have opted to embed crisis and disaster management as a component of the EM training curriculum, including Botswana, Chad, Madagascar, Niger, Rwanda, Senegal, Sudan, Uganda, and Zambia. In Senegal and Botswana, the program/coursework mainly cover emergency physicians. The minimum competencies include risk profiling, mitigation, response, recovery, categorizing the crisis, alerting the emergency response system, mobilizing the required resources depending on the level of crisis, establishing incident command processes and structures, triage and scene management. In Zambia, the EMS nurse training program addresses crisis and disaster management, though not explicitly. Further, the EMT training

curricula (e.g. Chainama College of Health Sciences) include crisis/disaster thematic, mainly covering rescue and extrication, safe patient transfer, emergency preparedness and response, basic fire search and rescue, and environmental emergencies and infectious diseases.

The majority of SSA countries report the existence of the eligibility requirements for postgraduate EM training. These include general requirements for admissions to any postgraduate degree, EM specific requirements and, additionally, requirements for international applicants. Master of Medicine in Emergency Medicine Programs present similarities across SSA countries with respect to admission requirements. The standards and requirements on classroom hours and didactic practice hours, in both a medical facility setting and onboard an ambulance, varies among postgraduate EM training programs. The authors conclude that many factors are considered to contribute to these differences – from conceptual EMS system model characteristics reproduced by training curriculum to local settings and availability of resources. The specific approach used in Botswana is shown in the box below:

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**Box 18 - EM Application, Curriculum and Examination Processes for Botswana Master of Medicine programs**

In 2011, the Faculty of Medicine at the University of Botswana established a 4-year Emergency Medicine postgraduate training.

· Applicants must hold a first degree in Medicine or equivalent from a recognized University and must have completed at least two years of clinical practice, of which at least 12 months must have been spent in a recognized supervised internship program.
· Three letters of reference from professional contacts must be included with the application submission.
· Preference is given to Botswana citizens; however non-citizens with proof of sponsorship will also be considered.
· Applicants meeting entry requirements are invited for an interview.

· Selection is based on the candidate's competitiveness, with an overall weighted assessment, as follows: 30% for academic qualifications, 30% for relevant experience including supportive references and 40% for the interview.

The Master of Medicine program involves didactic seminar instruction, supervised clinical apprenticeships in the specialty area (clinical rotations) and dissertation. EM residents work full time in the MoH health facilities and undertake training as an integral part of their clinical workload. Trainees complete eight semesters of Level 600 and 700 courses. The training structure is consistent with SADC and other international standards.

| Semester 1 (Credit total 20) | Semester 2 (Credit total 20) |
|---|---|
| GME 601 Communication, Ethics and Professionalism (2) (Prerequisites: MBBS degree) | GME 602 Introduction to Clinical Research (2) |
| GME 603 MMed Part 1 Exam preparation I (2) (Prerequisites: MBBS degree) | GME 604 M. Med Part 1 Exam preparation II (2) |
| GME 641 Principles of Emergency Medicine I (16) (Prerequisites: MBBS degree) | GME 642 Principles of Emergency Medicine II (16) (Prerequisites: GME 641) |
| Semester 3 (Credit total 20) | Semester 4 (Credit total 20) |
| GME 701 Introduction to Medical Literature (2) | GME 702 Public Health Principles & International Health (2) |
| GME 790 Introduction to the Dissertation (2) | GME 791 Dissertation 2 (2) |
| GME 703 M. Med Part 1 Exam preparation III (2) | GME 704 Introduction to Healthcare Management (2) |
| GME 741 Principles of Emergency Medicine III (14) (Prerequisites: GME 642) | GME 742 Principles of Emergency Medicine IV (14) |
| Semester 5 (Credit total 20) | Semester 6 (Credit total 20) |
| GME 792 Dissertation 3 (2) | GME 793 Dissertation 4 (2) |
| GME 705 Principles and Techniques of Medical Education (2) | GME 706 Presentation of dissertation I (2) |
| GME 743 Advanced Emergency Medicine I (16) | GME 744 *Advanced Emergency Medicine II (16) |

| Semester 7 (Credit total 24) | Semester 8 (Credit total 16) |
|---|---|
| GME 794 Presentation of Dissertation II (4) | GME 746 Advanced Emergency Medicine IV (16) (Prerequisites: GME 745) |
| GME 707 M. Med Part 2 Exam preparation III (2) | |
| GME 745 Advanced Emergency Medicine III (18) | |

The examination regulations of the University of Botswana establish general requirements applied to all MMed programs, and specific requirements for MMed in Emergency Medicine. The examinations shall be of similar standard as that of the College of Medicine of South Africa or similar international professional body for the EM specialty. Where possible, desirable and advantageous, the specialty may use the South African College examinations which shall be accepted by the University of Botswana as equivalent to its own examinations and for purposes of meeting the academic requirements of the MMed program. Residents are required to successfully complete rotations evaluations, Part I and Part II examinations and the dissertation prior to receipt of the MMed degree. The format is subject to review by the teaching staff of the Department of Emergency Medicine on an annual basis.

Rotations evaluations are written evaluations completed at least once per rotation. These assess procedural skills, fund of medical knowledge, medical management ability, patient communication and relationship skills, acceptance of supervision, work ethic, patient-centered focus, and medical record completion. The resident's performance is evaluated by the specialist/ lecturer.
· Part I MMed examinations are taken within the first two years of the program. In order to qualify for this examination, the resident should have attended at least 80% of the planned activities, satisfactorily rotated through clinical rotations and have been positively continuously assessed. A critical performance portfolio involving clinical cases, case write ups and logbook of procedures needs to be maintained by the EM resident and examined every six months by the Head of Department. The EM residents sit the Colleges of Emergency Medicine of South Africa Part 1 exam. This examination assesses the resident's knowledge of basic sciences and pathophysiology and their application to Emergency Medicine, fundamental principles of clinical, preventive and public health issues, as well as research fundamentals.
· The Part 2 MMed examination is taken within the final year of the program. In order to qualify for this examination, the resident should have attended at

least 80% of the planned activities, satisfactorily rotated through the appropriate number of clinical rotations and have been positively continuously assessed. The EM resident needs to successfully submit a critical performance portfolio prior to the Part 2 exam, which will include the submission of a research dissertation. The Part 2 MMed examination represents the Fellowship of the College of Emergency Medicine offered under the auspices of the Colleges of Medicine of South Africa. This examination assesses the resident's knowledge of clinical Emergency Medicine, ethics, health policy and common Emergency Medicine problems from other disciplines.

As reported by Tanzanian NRs, physician training in Emergency Medicine conforms to national and institutional regulations. It encompasses integrated and updated practical, clinical, and theoretical instruction, as well as is based on clinical participation and responsibilities in patient care. Thus, the training structure assumes that EM residents spend approximately half their time in the EM department itself, and half on outside rotations in other clinical departments relevant to the practice of emergency medicine, such as surgery, obstetrics–gynecology, cardiology, orthopedics, and pediatrics.

EM program examinations and evaluations of skills to be achieved at the completion of each course are subject to internal regulations of universities. In Tanzania, all exams and performance evaluations are organized by the EM faculty. The competency-based curriculum guides evaluation and permits resident performance to be appraised with reference to context-oriented proficiency. Each semester residents undergo a multidimensional evaluation including a written multiple-choice exam, a written essay exam, an oral case-based exam, and an observed clinical exam (with case presentation) on volunteer patients.

Several SSA countries report the existence of organized centers for medical simulation or medical simulation classrooms for EM trainees used in the framework of postgraduate and/or

undergraduate training, including in Botswana, Congo Brazzaville, Rwanda, Sudan, Tanzania, Uganda, Zambia, Zimbabwe, and Cabo Verde.



Figure 19 - Simulation lab - Muhimbili School for Allied Health Sciences School of Nursing

*Source: http://www.togoassistance.tg/*

In Congo Brazzaville, as reported by NRs, the EM simulation classrooms are organized in the framework of the Faculty of Health Sciences, paramedical and medico-social schools, as well as by the Civil Protection Authority and the Red Cross. Simulation training is mainly based on use of mannequins. In Uganda, additionally to MBBS undergraduate and MMed postgraduate programs offered by Mbarara University of Science and Technology and Makerere University, EM classrooms are established in Lubaga Hospital and Kampala Archdiocese, as small simulation centers. The simulation classrooms organized in Mauritania

are not EM-specific, but this infrastructure could be considered for EM training in the future. In Cabo Verde, the complementary EM nurse training curriculum includes practical classes (25 hours) at University of Cabo Verde (UNICV) simulation laboratories. Classes are dedicated to the training of specific techniques (basic and advanced airways, use of AED, basic life support and trauma techniques) for adults and pediatrics. Subsequently, the scenario resolution method with utilization of low-fidelity human patient simulators (ALS adult manikin, ALS baby manikin, Simulaids, etc.) is used.

# IV. Emergency Medicine Nurse Training

The situation of mid-level medical professionals, such as nurses, is more heterogeneous than that of EM physicians in the absolute majority of SSA countries. The role, competencies and educational requirements of nurses are substantially different across SSA countries. Similar to the EM physician training, these are determined by the EMS system model adopted by the country (i.e. hospital-based Anglo-American model or physician-based Franco-German model).

SSA countries appear to encounter major difficulties in categorizing the curricula for medium-level medical EM professionals (nurses, paramedics, technicians, etc.). Most SSA countries have no standardized training of medium-level medical professionals. For example, the nursing training varies from a very basic secondary school training to advanced diploma, bachelor's degree and master's level education. In many SSA countries, nursing training continues to be content-based, lacking emergency medicine content and formal supra-specialization in emergency medicine, critical care or trauma. Thus, many of these professionals are not properly trained for these additional tasks. By contrast, several SSA countries – Botswana, Rwanda, Tanzania, Uganda, etc. – undergone rapid transformation of nurse training system by implementation of competencies-based programs, transition to higher levels of training (A1 – Advanced Diploma and A0 - Bachelor) and phasing out lower levels of training (A2 – Diploma and A3).

According to the National Council for Nursing and Midwifery in Rwanda, the minimum training level requirement for a registered nurse is now A1 or its equivalent, with license to practice without any supervision from another nurse. In 2006, the Ministry of Health stopped training and deploying A2 training level nurses and midwifes, deeming their skills sets insufficient to provide quality patient care. A1 is obtained on completion of three years of tertiary education after secondary school, A0 – after four years of bachelor's degree program or two years of upgrading program. Specialization in Critical Care and Trauma is obtained in the framework of a two years Master of Science program. The nursing training, after adoption in 2013 of the law establishing the National University of Rwanda (based on merging all public higher education institutions) is provided by the School of Nursing and Midwifery under the University of Rwanda. The School offers advanced diploma in General Nursing, bachelor's degree in Nursing and master's degree in Critical Care and Trauma.

In Botswana, the Critical/Emergency/Trauma Nursing degree represents a sub-stream in

the framework of master's in nursing science program offered by the University of Botswana. The MNSc is a four-semester degree program consisting of coursework, a research essay, a clinical practicum and internship (see Table 21). The degree is offered both as a full-time and a part-time program. The University established the following entrance requirements to the Master of Nursing Science degree program: (a) a bachelor's degree in Nursing of this or any other recognized university, with at least a second class, second division or equivalent (3.0 GPA, on a 5-point scale) in the relevant field; (b) a current and active nursing license in Botswana or transferable in Botswana through the Nursing and Midwifery Council for Botswana; (c) a minimum of 2 years appropriate professional practice following the first degree, which may be acquired concurrently with part-time study. Equivalent degrees from other recognized academic institutions, candidates with a Pass at the undergraduate level in nursing programs, and professional practice for students who have obtained a Pass in their undergraduate programs may be considered on an individual basis.

Table 21 - Course sequencing for MNSc in Emergency/Critical/Trauma at University of Botswana

| Semester 1 | Semester 2 |
|---|---|
| MNS603 Family Health Nursing | MNS601 Theoretical Foundations of Nursing |
| MNS604 Health Assessment | MNS602 Research Methods in Nursing |
| MNS605 Normal Physiology and Pathophysiology | Specialty Courses (6 credits) |
| | Optional Courses (3 credits) |
| MNS606 Health Promotion across the Life Span | |
| STA683 Medical Statistics | |
| **Semester 3** | **Semester 4** |
| MNS707 HIV/AIDS Epidemic and Nursing Management | MNS 702 Research Essay |
| | Optional Courses |
| Sub-Specialty Courses (6 credits, core): MNS706 Disaster and Trauma Nursing MNS709 Advanced Skills in Disaster and Trauma Nursing | Internship |

The training curriculum is divided at a ratio of 60:40 between theory and practice. The rationale is that at a Masters' level, EM Nursing students' practice should be both theory- and evidence-based. The University of Botswana internal regulations establish that each course is assessed by continuous assessment, which may entail tests, assignments, written papers and oral presentations. This assessment is based on the following three components of work: two components of theory consisting of a major assignment and a final term assignment, and a cumulative practicum report. At the same time, a coursework taken in departments other than Nursing Education is

examined in accordance with the Regulations of the Departments in which the work is taken.

The School of Nursing of the MUHAS is the sole public institution that provides MSc Nursing Critical Care and Trauma in East Africa. The length of the nursing training program is established by the Nursing and Midwifery Law. The program is eligible for applicants with a MUHAS BSc Nursing degree and a GPA of 2.7 or from a recognized University who has been admitted to the status of BSc Nursing or Equivalent with a GPA 3.0.

In Uganda, the Mbarara University of Science and Technology implemented, at Masaka Regional Referral Hospital, a two-year diploma program for nurses and clinical officers to become Emergency Care practitioners. In Zambia, the Emergency and Trauma Nursing program was launched in 2018 in the framework of the Chainama College of Health Sciences and Lusaka Schools of Nursing and Midwifery.

In Sudan, emergency medicine knowledge basis and skills are provided both at the undergraduate (four-year Bachelors' degree program) and postgraduate training levels. The programs apply the entry requirements, semester, modular and credit hour plans adopted by the National University and abide by the Academic Regulations. A graduate of the Faculty of Nursing and Midwifery of the Sudan National University should be able to manage emergencies and perform life-saving procedures and critical care and decide and act properly on cases needing consultation with colleagues or referrals to specialized centers or personnel. The six-week Emergency and Critical Care module covers the following: (a) cardiovascular system: angina, acute myocardial infarction heart failure; (b) respiratory system: mechanical ventilation, pulmonary embolism, acute respiratory distress; (c) gastrointestinal system: gastrointestinal bleeding, bowel obstruction, pancreatitis, liver failure; (d) renal system: acute tubular necrosis, hyperosmolar non-ketotic coma, diabetes insipidus, cerebral salt wasting; (e) hematologic system: acute sepsis, thrombocytopenia, disseminated intravascular coagulation; (f) nervous system: seizure, status epilepticus, meningitis, spinal cord injuries; (g) integumentary system: burns, skin breakdown, necrotizing fasciitis; (h) multi-system: multiorgan dysfunction syndrome; (i) perform management of patients with the following emergency medical conditions: pulmonary embolism, seizure disorders, diabetic ketoacidosis, cardiac arrest, cardiac failure, arrhythmias, shock, asthma; (k) perform management of patients with the following emergency surgical conditions: chest trauma, flail chest, hemorrhage/shock, abdominal trauma, back injury, head injuries. Further, a postgraduate qualification could be acquired in the specialty of Nursing in Emergency/Critical Care/Trauma.

The introduction of emergency medicine content into the nursing training (bachelor's degree program) is reported also in University of Cabo Verde. The complementary curricular training (40 hours theoretical classes and 25 hours practical classes) involved integrated system of pre-hospital care with regard to the systematic evaluation in Advanced Life Support in accordance with European Resuscitation Council.

The development of a specific regulatory framework in the field of nursing training, including specialization in Emergency, Critical Care and Trauma, contributed to more progress in nursing training within private schools at different levels. In Rwanda, the nursing training (A1 level – advanced diploma) is provided at Kiboroga Polytechnic (Faculty of Medicine) and Nursing and Midwifery Schools in Rwamagana, Kabgayi and Ruli, although only Kabgayi Nursing and Midwifery School (Government subsidized higher education institution) curriculum includes knowledge and skills to carry out emergency measures.

By contrast, other private schools' curricula (General Nursing advanced diploma) lack in emergency medicine content (see Table 22). Similarly, in Tanzania, most of its School of Nursing (e.g. at St. John's University, Tarime, Newala, Nzega, Tanga, Sengerema, Dareda, offer a degree in General Nursing (Diploma and BSc in Nursing).

Table 22 - General Nursing Training Program Structure at Kiboroga Polytechnic (Faculty of Medicine)

| Code | Module | Credits | Hours |
|------|--------|---------|-------|
| **Level I** | | | |
| H101 | Philosophy, Ethics and Rwandan Culture | 10 | 100 |
| H103 | Psychology Sciences | 10 | 100 |
| H104 | Anatomy and Philosophy | 15 | 150 |
| H105 | Fundamentals of Nursing and Midwifery I | 10 | 100 |
| H106 | Biochemistry and Nutrition | 5 | 50 |
| H107 | Microbiology and Parasitology | 10 | 100 |
| H150 | Clinical Placement I | 25 | 250 |
| H152 | General Pharmacology | 5 | 50 |
| H153 | Fundamentals of Nursing and Midwifery II | 20 | 200 |
| H155 | Community Health Nursing I | 10 | 100 |
| **Level II** | | | |
| H200 | Clinical Placement II | 20 | 200 |
| H201 | Clinical Pharmacology | 10 | 100 |
| H202 | Health Assessment | 5 | 50 |
| H203 | Pathophysiology | 10 | 100 |
| H211 | Medical-Surgical Nursing I | 15 | 150 |
| H250 | Clinical Placement III | 20 | 200 |
| H252 | Research Methods and Evidence Based Practice | 10 | 100 |
| H253 | Community Health II | 5 | 50 |
| H261 | Medical-Surgical Nursing II | 20 | 200 |
| H251 | Tropical and Communicable Diseases | 5 | 50 |
| **Level III** | | | |
| 300 | Clinical Placement IV | 20 | 200 |
| H302 | Reproductive Health and Gynecology | 10 | 100 |
| H300 | Child Health I | 10 | 100 |
| H314 | Child Health II | 10 | 100 |
| H312 | Maternity Nursing | 10 | 100 |
| **Level IV** | | | |
| H400 | Clinical Placement V | 40 | 400 |
| H452 | Mental Health | 10 | 100 |
| H453 | Quality Assurance, Leadership and Management | 10 | 100 |
| H314 | Child Health II | 10 | 100 |

At the same time, responding to emerging needs, the School of Nursing and Midwifery of the Aga Khan University included the Critical Care and Emergency Nursing program (Specialized Diploma degree). Moreover, the School of Nursing and Midwifery operates at regional level in Nairobi, Kenya; Dar es Salaam, Tanzania; and Kampala, Uganda.

As previously discussed in this chapter, in many SSA countries, with both Anglo-American model and physician-based Franco-German model, nursing training continues to be content-based, lacking emergency medicine content and formal supra-specialization in emergency medicine, critical care or trauma (e.g. Burundi, Burkina Faso, Central African Republic, Chad, Togo, Cameroon, Cabo Verde, Sierra Leone, etc.). The role of an Emergency Medicine nurse, as well as the competencies required to be a nurse specialist, are therefore yet to be defined, and the focus of the current training content is seen to be reactive rather than proactive. Thus, EM nurse training is predominantly acquired on the job, and through some courses that were offered to general nurses covering topics identified by EMS providers or in the framework of technical assistance projects, although these courses were not accredited by any educational authority or standardized.

In Congo Brazzaville, as reported by NRs, the initial two-year training of nurses is provided in the framework of paramedical and medico-social schools. Certified nurses and nurse anesthetists acquire specific EM skills and knowledge on the job. Similarly, in Niger, the Faculty of Medicine trains nurse anesthetists subsequently employed at EMCS. In Lesotho, as in many regional countries, nurses are mostly trained to work as general nurses within programs implemented at all six nursing schools accredited by Lesotho Nursing Council – Paray School of Nursing (Certificate in Nursing Assistant and Diploma in Nursing), Scott School of Nursing (Certificate

in Nursing Assistant and Diploma in General Nursing), Maluti School of Nursing (Diploma in General Nursing), Roma College of Nursing and National University of Lesotho (BSc in Nursing). There is no postgraduate specialization in EM Nursing at the National University of Lesotho, as the areas of specialization offered by the admission plans include Advanced in Medical and Surgical Nursing, Community Health Nursing and Primary Care Nursing.

Similarly, nursing education in Liberia is directed towards training general nurses with little subsequent EM specialized training. Emergency medicine programs, both for physicians and nurses, were initiated in the framework of a twinning partnership between JFK Hospital, Liberian Government and US academic medical centers. No standardized curriculum has been implemented in a consistent way to support formal graduate and postgraduate training in emergency medicine.

Nursing education in Sierra Leone is primarily provided by the College of Medicine and Allied Health Science of the University of Sierra Leone, as well as by nursing schools in Bo, Makeni, Kenema and Lunsar. The university offers three degrees for nursing education: BSc. in Nursing (four-year training), Diploma in Nursing (three-year training) and Certificate in Nursing (two and a half-year training). There is no specialized EMS training offered for nurses. However, the King's Sierra Leone Partnership launched (in 2016) specialization training programs for emergency nurses, at Connaught Hospital, based on the African Emergency Nursing Curriculum.

In the majority of SSA countries, continuing professional development of EM nurses is either fragmented and not formalized or almost non-existent. However, Tanzania is the case worth mentioning. CPD is a mandatory requirement for re-licensure under the Nursing and Midwifery Act No.1 of 2010 and the Nursing and Midwifery

Registration, Enrolment and Licensing Regulations of 2010. Thus, nurses are required to obtain not less than 30 points of CPD activity within three-year period for renewal of their practicing license. A wide range of activities, both formal (classroom based) and informal (workplace or community based), are recognized toward meeting the CPD requirement. The type of CPD activity undertaken depends on the level of educational preparation of the practitioner. CPD points are allocated, one hour of active learning for different activities qualifying for 1, 2 or 3 points, depending on the activity undertaken. For example, one hour of active learning attending an in-service at work qualifies for 1 point; twelve hours of active learning attending a two-day conference qualify for 12 points; six hours of active learning while undertaking a face to face short course qualify for 18 points; and one hour acting as a mentor or preceptor

qualifies for 2 points. In Liberia, CPD programs for nurses must be accredited by LBNM.

In Zambia, the Ministry of Health may, at the recommendation of the HPC and/or GNC, develop regulations to provide for continuing professional development and training to be undertaken by EMS professionals. These regulations cover the nature and extent of continuing professional development and training, and the criteria for recognition by the HPC and/or GNZ of continuing professional development, training programs and education institutions. However, the NRs report CPD requirements for EMTs in the context of recertification.

Sierra Leone reports the existence of requirements for EMT Basic staff to complete continuing education to maintain certification.

# V. Other EMS Professionals Training

There is considerable variation in the training of other EMS professionals (i.e. emergency medicine technicians, paramedics, public service access point (PSAP, or dispatch) personnel, ECC personnel, etc.), and this is largely dependent on the formal introduction of such professionals within the EMS systems.

No references were provided regarding the minimum and maximum content of training for each of the above-mentioned categories of EMS professionals. The duration of the training programs is mainly determined by the length of time needed to acquire the necessary competencies.

In Botswana, a one-year course is used for EMT Basic training. It is focused on training year 12 school leavers. The course covers non-

invasive basic life support treatment and patient transportation. An EMT Advanced degree is offered after graduation of a two-year training course and the main competencies are limited to invasive prehospital care and administration of a limited number of drugs. Training of ALS Paramedics is provided by a private training institution not accredited by the Botswana Health Professions Council. However, in order to be registered as a paramedic the applicant shall graduate an accredited training institution.

In Uganda, the training of EMT Basic, designated as emergency care assistants, is realized in the framework of a three-month course. The EMT Advanced Diploma course is offered at Mbarara University of Science and Technology and Lubaga Training Institute. In

Zimbabwe, a five-week Ambulance Technician course is provided by two private training organizations – EMRAS Training Academy and ACE Emergency Medical Training Academy, accredited by the Allied Health Practitioners Council of Zimbabwe. ACE EMTA training curriculum includes real life training scenarios with ALS computerized full-size manikin.

In Zambia, one-year training is applied for Emergency Medical Care Technician (Certificate) and a three-year training for Emergency Medical Care Technologist/Paramedic (Diploma). The NRs report the existence of eligibility requirements for EMT training, namely – (a) five credits or better at Grade 12 or its equivalent in English, Biology, Science, and Mathematics; (b) physical fitness assessment; (c) structured personal interview; (d) medical examination; (e) minimum age of 18 years. EMT certification includes 700 hours of academic training, 500 hours of practical training, 120 hours of hospital training, 200 hours of ambulance training, as well as 450 hours for both internship in hospital and ambulance. After licensure examination, managed by HCP, the professionals have the obligation to undertake internship for six months in an EMS facility which has a resident and a practicing EMT Advanced/Paramedic.

In Sierra Leone, NRs report a two-week training for EMT Basic. In addition, the College of Medicine and Allied Health Sciences of the University of Sierra Leone, with support from the Ministry of Health and the World Bank, started training paramedics in 2016 (five-week course) in emergency response, targeting fire and road accidents. The training covers four regions of Sierra Leone, after the completion of which trained paramedics are certified and granted the right to work in the ambulance service.

Malawi reports development of the in-service EMS training program for doctors, clinical officers, medical assistants and nurses. These are trained at the Malawi College of Health Sciences during a ten-week program, with a specific focus on road accident victims' management and transportation to the nearest health facility.

Most SSA countries report the absence of a training and registration system for PSAP and ECC professionals. Uganda and Zimbabwe cases are worth mentioning. In Uganda, one-month training is provided for ECCs personnel. Zimbabwe reports that PSAP and/or ECC personnel is trained by the private EMS providers who individually define the breadth and depth of the training content and employ their own training standards.

Minimum standards for teaching staff are reported by most SSA countries that have training programs for EMT professionals. Thus, for each category of training program, a minimum number of full-time registered tutors are appointed. The qualifications of a tutor or teacher of a certain course are higher than that of the course he/she is teaching or facilitating.

Most SSA countries report the existence, at local or national level, of EMS training institutions, including non-accredited and EMS providers, that provide pre-service and in-service training; they individually define the breadth and depth of the training content, and employ their own training standards. In many cases, courses are organized by the Red Cross/Red Crescent Movement (Congo Brazzaville, Central African Republic, Rwanda, Senegal, Uganda, etc.) and other non-governmental organization (Educational Center of the Holy Union, Senegal). In Liberia, Médecins sans Frontières provides in-service training for nurse anesthetists at Bardnesville Junction Hospital, a teaching hospital validated by the Liberia Board for Nursing and Midwifery as a site for clinical skills training. However, these cases cannot be regarded as part of formal training programs of EMS professionals.

On the other hand, in several SSA countries, courses are open to employees as refresher courses or in-service specialization – Rwanda (Emergency Medicine Care Service), Senegal (National Fire Brigade), Uganda (St John's Ambulance Kampala), Zimbabwe (EMRAS Training Academy and ACE EMTA), Tanzania (Emergency Medicine Association of Tanzania), etc.

These courses include the following: Basic and Advanced Trauma Training, Advanced Trauma Management for Healthcare Provider, Emergency Room Advanced Training, ACLS, BLS, PALS, ITLS, Pediatric Emergency Care Training, etc.

# VI. EMS First Responders Training

Two separate types of EMS first responders training programs are offered across SSA countries. This differentiation appears to be mainly determined by the category of EMS first responders – public safety workers (police officers, firefighters, etc.) and laypersons (community workers, commercial drivers, passersby, etc.). On the other hand, community health workers and Red Cross and Red Crescent Volunteers who operate as first responders in certain SSA countries (i.e. Cameroon, Rwanda, Uganda, etc.) are not a target group for specific first responder training.

Uganda implemented the WHO Basic Emergency Care (BEC) course in training police officers. The one-week in-service training, organized at the School of Public Health of the Makerere University, prepares frontline providers to address life-threatening conditions within a limited-resource context. In an initial phase, the course was piloted in three SSA countries – Uganda, Tanzania, and Zambia – in collaboration with the Emergency Medicine Association of Tanzania and Emergency Medicine Uganda.

The case of Uganda is worth mentioning in terms of the formal and institutionalized training program for first responders. Its organizational framework appears to be based on the legal responsibility of the Directorates of Police Health Services to provide the Emergency Medical Services, respectively of policy officers to act as first responders. By contrast, all other cases identified across SSA countries are fragmented, with wide variations in curriculum and certification, and are not aligned to the needs of first responder care as a formal tier-one of the EMS system. Moreover, the FRC may not be considered as a formal tier-one of the EMS system due to lack of a policy framework that establishes a large-scale community response integrated both administratively and financially.

Consequently, the development and implementation of training courses for laypersons in SSA countries presents three major challenges: (a) establishing the pre-hospital interventions that had the highest possibility of changing outcomes of injured persons, (b) finding methods in which such interventions would be taught to persons of low educational background in a short period of time, and (c) adapting such training to the specific needs and resources of the local environment.

Accessing of a first responder training course is mainly through self-registration and privately-sponsored. Courses may be organized by Government agencies, universities, EMS providers and private training institutions. At the same time, public initiatives in training first responders are reported (e.g. Madagascar).

The Tanzanian Occupational Safety and Health Authority (under the Ministry of Labor and Employment) has organized first aid training to enable workers to deal with health emergency situations at work, in public places, at home, in the street, etc. The target group is represented by nominated workplace first aiders, or anyone in need of a comprehensive introduction to the first aid. The course curriculum covers the first aid provision, accidents and incidents, medical emergencies (epilepsy, stroke, asthmatic and diabetic shock, utilization of first aid kit, treatment of an unconscious casualty, foreign bodies and eye injuries, poisoning/allergic reaction, burns and scalds). The training methodology includes instructional lectures, plenary sessions and practical demonstrations. The course is offered for three consecutive days at 250.000 TZS (approx. 110 USD) per participant. First Aid Training is also provided by the Emergency Medicine Association of Tanzania. The course is MUHAS accredited and eligible to receive an official certificate from the University.

The EMRAS Training Academy, based on accreditation by the Allied Health Practitioners Council of Zimbabwe, offered a number of courses including Basic Life Support courses for non-healthcare providers (1 day), BLS for healthcare providers (2 days), Basic, Advanced and Industrial First Aid courses (4 days), Mine Specific First Aid, Water Rescue and Drowning (1 day). All training courses are open both to general public and PSMI employees. However, employees need to seek approval from their supervisors and also the Human Resources Centre for Learning Department. An accreditation with regional and international bodies is required to conduct internationally licensed courses (e.g. Advanced Cardiac Life Support, etc.).

The Uganda Red Cross Commercial First Aid training programs have been developed to support different categories of individuals and institutions in line with the requirements of Occupational Safety and Health Act 2006. The curriculum for commercial first aid covers different target groups in workplaces, homes, schools, on the roads, at events and in emergency situations (see Table 23).

Table 23 - Uganda Red Cross Commercial First Aid training programs characteristics

| | | |
|---|---|---|
| First Aid at Work Place | 16 Hours/ 2 Days | 2 Years |
| Basic Fire Fighting | 8 Hours | 3 Years |
| Basic Road Safety Certificate | 24 Hours / 3 Days | 3 Years |
| Childcare First Aid | 16 Hours / 2 Days | 3 Years |
| Automatic External Defibrillators | 2 Hours | 1 Years |
| School First Aid | 4 Hours | 3 Years |
| Intermediate skills first aid | 40 Hours / 5 days | 3 Years |
| Advanced First Aid | 80 Hours/ 10 days | 3 Years |
| First Aid Training of Trainers | 80 Hours/ 10 days | |

Malawi reports a pilot-based approach in training first responders. Under contract from the MOH, the Malawi Red Cross trained close to 500 first responders from communities stretching the M1 highway and ambulance drivers from the involved districts in first aid procedures and techniques. These community first responders were intended to be the first line of response

for a pilot EMS implementation designed to improve post-crash response along the M1 corridor between Lilongwe and Blantyre.

A taxi driver FRC training program in Madagascar was developed in partnership between the Mahajanga University Hospital, Mahajanga municipality, Division of Emergency Medicine of the University of Cape Town and the Emergency Medicine Society of South Africa (EMSSA). The one-day course was attended by twenty-six taxi drivers selected by the municipality, and the program was designed to be locally appropriate and covered the most common aspects of prehospital scene management, bleeding and broken bones, immobilization and patient movement, labor and delivery. On questioning, many of the taxi drivers described women delivering in their vehicle, and,

consequently, it was decided to include aspects of basic birthing care into the training program.

The authors did not find references to institutionalization of first responder training courses of the type implemented in Madagascar. To maintain the quality of skills gained, it is imperative for authorities to provide ongoing training opportunities and for laypersons (e.g. commercial drivers, etc.) to attend periodic refresher trainings. However, certification periods did not appear to be provided for.

Liberia started to design the training program and the regulatory framework for certification of EMS first-responders. Thus, the initial course certification, as well as the eligibility criteria and requirements are in early stages of consultations.

# VII. EMS Professionals Practice Authorization

The lack of uniformity across SSA countries is quite pronounced in the field of the authorization of EM professionals' practice (i.e. certification, accreditation, registration, etc.). Most of SSA countries report the existence of certain requirements and/or regulations on entering or reentering the EMS field.

Certification of EMS professionals is not a common practice across SSA countries and is limited to countries with a developed regulatory and institutional framework in the field of health practitioners' authorities (i.e. boards, councils, etc.) – Botswana, Zimbabwe, Uganda, Rwanda, Tanzania, Zambia, etc. Upon completion of training, EMS professionals should be certified as ready-for-independent-practice through a standardized process. In some countries, the certification is based exclusively on registration of the EM professional through

the validation of records (e.g. Zimbabwe), whilst in others, the certification includes the obligation of passing a standardized exam (e.g. Botswana, Liberia, Tanzania, Zambia, etc.).

In Botswana, all who were awarded a MMed degree in Emergency Medicine from the University of Botswana qualify for specialty registration with the Botswana Health Professions Council. The application for registration made to the BHPC includes the applicant's identity and such proof of the qualifications on which the applicant relies, the applicant's certificate of good character and standing, a sworn declaration of oath, and any other information as the BHPC may require. If all the facts and documents submitted in support of the application are adequate and in accordance with the requirements of the legislation, BHPC shall, upon payment of the prescribed fee, enter the name of the applicant in the EM register and issue the

certificate of registration, entitling the applicant to practice Emergency Medicine in Botswana.

At the same time, BHPC may require the applicant for registration to sit for examination for the purpose of ascertaining whether the applicant possesses a standard of professional knowledge and skill not less than that required by the BHPC for the EM practice in Botswana, has sufficient knowledge of the laws of Botswana relating to the practice of health professions, and is proficient in at least one of the official languages of Botswana. An annual fee must be payable by every registered EM professional who wishes to continue to practice in Botswana.

In Tanzania, the licensing of nurses is mandatory by law and is done in accordance with nursing and midwifery registration, enrollment and licensing regulations. The licensure examinations are conducted to all pre-service and in-service nursing students in certificate and diploma in their final year after their qualifying examinations. Those who qualify from certificate level education program are registered and licensed as Enrolled Nurses, while these who qualify from Diploma up to degree levels (e.g. Critical Care and Trauma Nurse) are registered and licensed as Registered Nurses. TNMC provides two minimal competency examinations – licensure examinations for Enrolled Nurses and licensure examination for Registered Nurses. TNMC developed delegated legislation to regulate the licensing process. This covers the following issues – licensure examination committee; operational panels; eligibility, registration and withdrawal; licensing examination; LE transportation; LE storage; LE invigilation; and marking, recording and release of LE results. Nurses who have qualification recognized by TNMC and passed examination are registered in appropriate part and section. Every registered nurse shall, before 31st of December of the third year, file information to TNMC for the retention of his/her name in the register.

The Liberian Board for Nursing and Midwifery has a mandatory licensing procedure whereby it organizes state board examination for general nurses and nurse anesthetists. The professional nurse license under the provision of the LBNM shall be renewed, it being valid for two-year periods. The license renewal represents a technical validation of the application by LBNM.

In Zimbabwe, in the Specialist Register are included both practitioners who have completed locally postgraduate studies and practitioners with recognized foreign postgraduate qualifications in emergency medicine. In addition to the standard required documentation (completed application form, certified copies of qualifications, etc.), a local EM professional must submit a six-monthly Senior Registrar assessment form endorsed by the Clinical Director, Head of Department, Head of Division and supervisors, whilst a foreign EM professional - two testimonials from practitioners whom the applicant practiced with for the last 6 months. The application fee is established at 220 USD for Zimbabweans and 450 USD for non-Zimbabweans.

In Sudan, trainees qualified with a Bachelor Degree pass through a track decreed by the Health Professions Council, and are accredited as nurses to practice in hospitals or health centers, both public and private, as well as may pursue postgraduate studies to obtain master's degree or PhD in the field of nursing and/or to qualify for university teaching staff. International graduates can follow the same track if they preferred to stay in Sudan but may also start their registration and internship in their own countries.

Most SSA countries authorize by endorsement local or foreign EMS professionals registered for practice in another jurisdiction or country. The procedures and practices are those established by health professionals' authorities or central authorities in the field of healthcare and education (see Table 24).

Table 24 - Authority responsible for EM professionals' authorization by endorsement

| Authority | Countries |
|-----------|-----------|
| Health Professionals Authority | Central African Republic |
| | Madagascar |
| | Rwanda |
| | Sudan |
| | Zimbabwe |
| | Tanzani |
| | Zambia |
| Specialized Agency of the Ministry of Education Ministry of Health | Chad Comoros |
| | Niger |
| Faculty of Medicine | Madagascar |
| Homologation Service | Togo |

In Niger, the authorization by endorsement procedures are based on Economic Community of West African States (ECOWAS) Agreements. In Botswana, the BHPC does not accept for registration qualifications from a university or other institution outside Botswana, unless the qualification entitles the holder thereof to practice the relevant profession in the country in which such university or institution is situated, and it is satisfied that the possession of such qualification indicates a standard of professional education not lower than that required for EM practice in Botswana.

In Zambia, a person trained outside the country and non-holder of a qualification recognized by the HPC, may apply for temporary registration. HPC issues a temporary certificate of registration (for a period not exceeding two years) if the applicant possesses appropriate knowledge and training,

passed the prescribed assessment examination conducted by the relevant education institution in Zambia, and provides a certificate of good standing from the professional authority in the country where the person is currently practicing. Further, the authorized EMS professional has the responsibility to serve in Zambia at the request of the Zambian Government or a licensed health facility.

The utilization of the Register of EMS professionals is reported in several SSA countries (see Table 25). In Uganda, the Register is not yet operational, but according to the legislation in force, this activity is in the responsibility of the Uganda Medical and Dental Practitioners Council and the Allied Health Professionals Council.

Table 25 - Institution responsible for the maintenance of the EMS specialists Register

| Institution | Countries |
| --- | --- |
| Health Professionals Authority | Botswana |
| | Zimbabwe |
| | Uganda |
| | Tanzania |
| | Liberia |
| | Rwanda |
| | Zambia |
| Ministry of Health (HR Service) | Niger |
| | Sudan |
| Central Department of Health of Armed Forces (HR Service) | Niger |

At the same time, the responsibility for the maintenance of the EMS specialists Register appears in most cases to be delegated to the health professionals' authorities. In Zambia, the Health Professions Council registers EMS professionals as EM physician and emergency care officer. However, in the Register the records are categorized by qualifications, namely – (a) Certificate in BLS/Intermediate/ALS or equivalent, (b) Diploma in BLS/Intermediate/ALS or equivalent, and (c) Degree in BLS/Intermediate/ALS or equivalent. In Tanzania, Zambia and Liberia, there is a separate public register for nurses held by the board for nursing and midwifery.

# VIII. Financing of EMS Training

Several SSA countries report state funding for pre-service and in-service EMS training[81]. Many Governments appear to be prepared to offer scholarships[82], grants or tuition assistance to prospective students. Typical tuition fees at the time of this study are presented in Table 26. Additionally, industrial trusts and corporations, as well as technical assistance programs, also offer awards, usually through the appropriate Government agencies. Most EM graduate and in-service training programs in Uganda are privately sponsored. The Ministry of Health covers certain postgraduate training. Therefore, Makerere

[81] Botswana, Burkina Faso, Central African Republic, Congo Brazzaville, Niger, Rwanda, Senegal, Sudan, Uganda, Zambia, Zimbabwe
[82] Information about these scholarships should be obtained from the appropriate authority (MoH, MoE, health professionals' authorities, etc.) in the country concerned.

University applicants seeking sponsorship should have their applications endorsed by their respective sponsors where applicable. Applicants should note that various fees payable to the University for different programs exclude functional fees, accommodation, books, research and other expenses. Tuition fees per annum for MMed program in Emergency Medicine at Makerere University are established at US$1,320 for Ugandan and East African students and at US$4,880 for international students.

The University of Botswana MBBS and MMed trainees on sponsorship from the Government receive compensation packages consistent with state policies and previous experience. Applicants not on Government sponsorship will have to arrange their own sponsorship to cover UB fees (see Table 26), books and related items, travel and living expenses.

Table 26 - Tuition fees for EM training programs

| Country | Institution | Training Program | Tuition fees (US$) | |
|---|---|---|---|---|
| | | | Local | International |
| Uganda | MUST | MMed in EM | 2,230 | 4,460 |
| | MakCHS | MMed in EM | 3,980 | 14,640 |
| Rwanda | | MMed in EM | 6,990 | 8,380 |
| Botswana | UB | MMed in EM | 10,040 | 15,000 |
| Sudan | National University | Postgraduate Diploma | 260 | 3,000 |

# CHAPTER 5

# EMS Communication

# CHAPTER 5: EMS Communications

## I. Introduction

The following chapter aims to address two basic tenants related to EMS communication standards and protocols. It begins with a comprehensive review across SSA on the various telecommunication methods that are being utilized by EMS and other emergency services (i.e. police and fire services), including the existence of short code emergency numbers (e.g. 112 or 911) and requirements for telecommunications providers to support such short codes. Secondly, it examines approaches to standards for (a) communications between emergency dispatchers and emergency teams, (b) between emergency teams of different services while in the field, (c) between emergency teams of the same service while in the field, and (d) between emergency teams and hospitals. It also looks to the existence of dedicated data, voice and/or radio communications systems for the sole or coordinated use among various emergency services as well as any national plans for implementing EMS communication systems.

The chapter provides details on communications regulations and standards as they relate to EMS systems across SSA countries to support the development of policy recommendations. However, the chapter does not consider the advantages and disadvantages for the EMS models adopted by SSA countries, does not take a position on whether regulatory approach should be applied, or measure the degree of EMS communications standards implementation and the success or failure of implementing various EMS communications policies.

The chapter provides an evaluation of regulations and standards in four key areas of EMS communications: public access to EMS service, EMS dispatch and control, interagency communication for EMS and medical control communication. It provides an analysis that is exclusively from the questionnaire data provided by the National Respondents (NRs). No data used in this review were obtained on site. Missing data and discrepancies triggered a detailed review of laws and other regulatory acts, policy and planning documents, charters and statutes, official websites, reports and other materials to which reference has been made.

## II. Public Access to EMS Service

An essential component of any EMS communications system is the assurance that anyone can rapidly summon emergency assistance through public access to a public safety communication method such as phone number. All SSA countries report National Numbering Plans (NNPs) to administer national telecommunications numbering resources. However, NNPs in most cases are determined by market readiness. Likewise, respective

authorities responsible for regulation and coordination of a country's numbering resource is in place in all SSA countries. Except for Mauritania, Niger and Rwanda, where numbering is administered by a regulatory authority with a broad mandate (in energy, transport and other utilities), all other SSA countries surveyed have a dedicated regulatory authority that is responsible exclusively for the field of communications.

Some SSA countries (i.e. Botswana, Comoros, Gabon, Togo, Uganda) designed Numbering Policies to provide a long-term framework within which the National Numbering Plan may continue to be developed to meet future demands, including the provision of reasonable capacity as a contingency for new services, and for ease of future expansion of the scheme, for the benefit of all public telecommunications users. For example, the drafted Botswana Numbering Policy addresses emergency numbers and the associated requirements (e.g. national ECC, etc.) in the context of revising the current Numbering Plan. Thus, the intention is that emergency services be accessed through the toll-free number 112 as this is a requirement of the GSM standard.

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**Box 19 - Standard for numbering emergency services access numbers**

In all SSA countries, the numbering of emergency services access numbers is aligned with the International Telecommunication Union (ITU) Recommendation E.161.1 and represents a non–E.164 number allocated in the National Numbering Plan to enable emergency calls. With few exceptions, all emergency services numbers are attributed to Level 1 of the National Numbering Plan.

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The National Numbering Plan in most SSA countries use the term "special services" when addressing the procedures and conditions attached to number allocation for public safety services (see Figure 19). However, the revised and updated versions of the National Numbering Plans operate with the terms "emergency services" and "emergency numbers".

Figure 20 - Terms used in National Numbering Plan
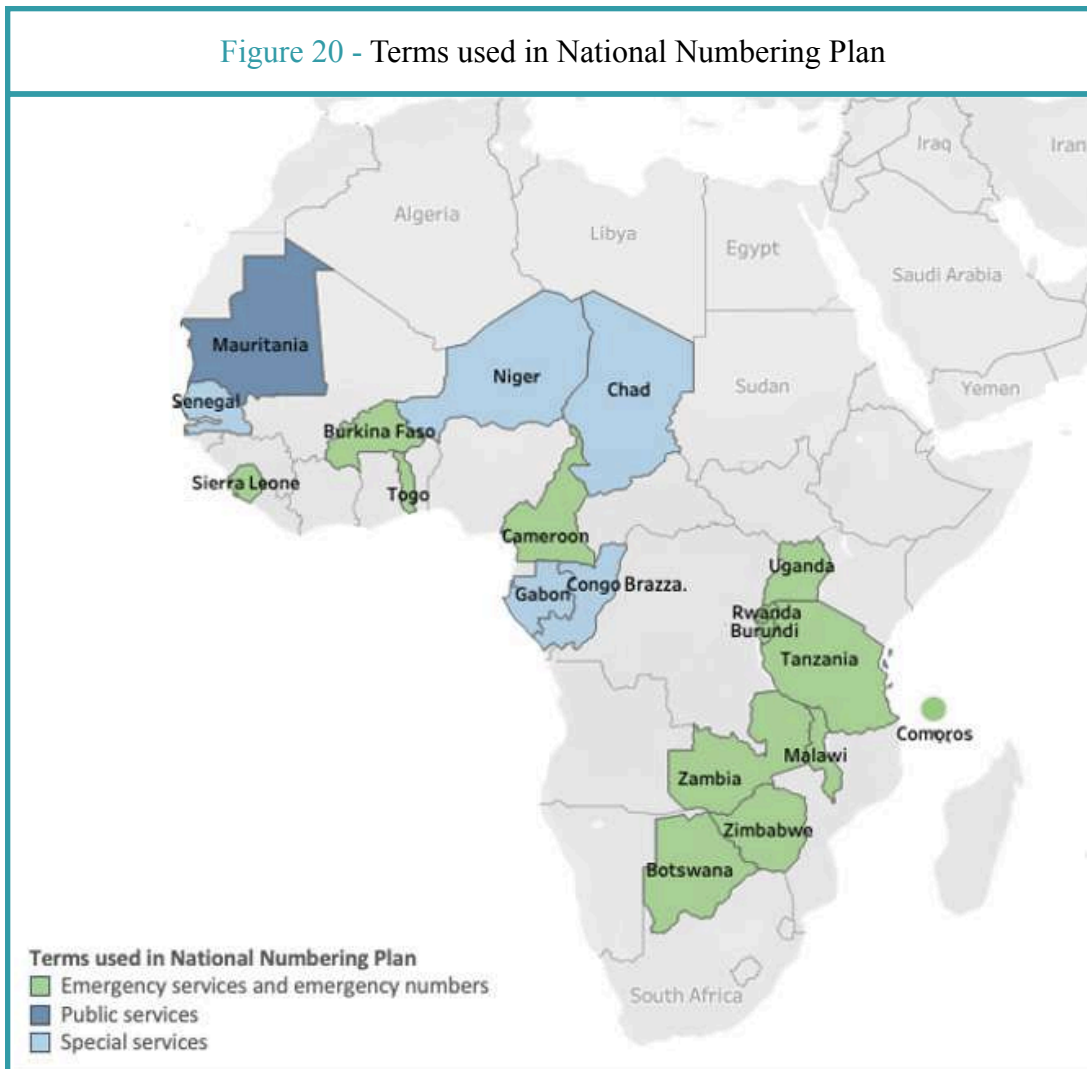
In Cameroon, the legislative framework on electronic communications establishes Universal Service as a minimum set of good quality services that are accessible to the entire population and which particularly covers free access to emergency services and routing of emergency calls. The Comoros Communication Regulatory Authority defines the emergency number as a single national number included in the National Numbering Plan to allow emergency calls. The Uganda National Numbering Plan operates with the term of emergency services codes to define the numbers to be used to access national services associated with emergency and safety service.

International standards require that, in addition to any other national emergency call number specified by the national authorities, all end users of all types of telephones that have access to the public or commercial telecommunication networks have the possibility to call the emergency services free of charge by using the single emergency number. The objective of the requirement is to maximize the probability that a user will be able to make a basic telephone call to the appropriate emergency service whenever necessary without imposing undue constraints on terminals, networks or service providers, and to provide the emergency service with as much

location information as reasonably possible.

At SSA level, a single emergency number is applied in four countries (see Figure 20).



Figure 21 - Single emergency number across SSA countries

Single emergency number across SSA countries
- 112 (Fire, Police, EMS) (allocated but not operational yet)
- 911 (Fire, Police)
- 912 (Fire, Police, EMS) (allocated but not operational yet)
- 999 (Fire, Police, EMS)
- Not in place
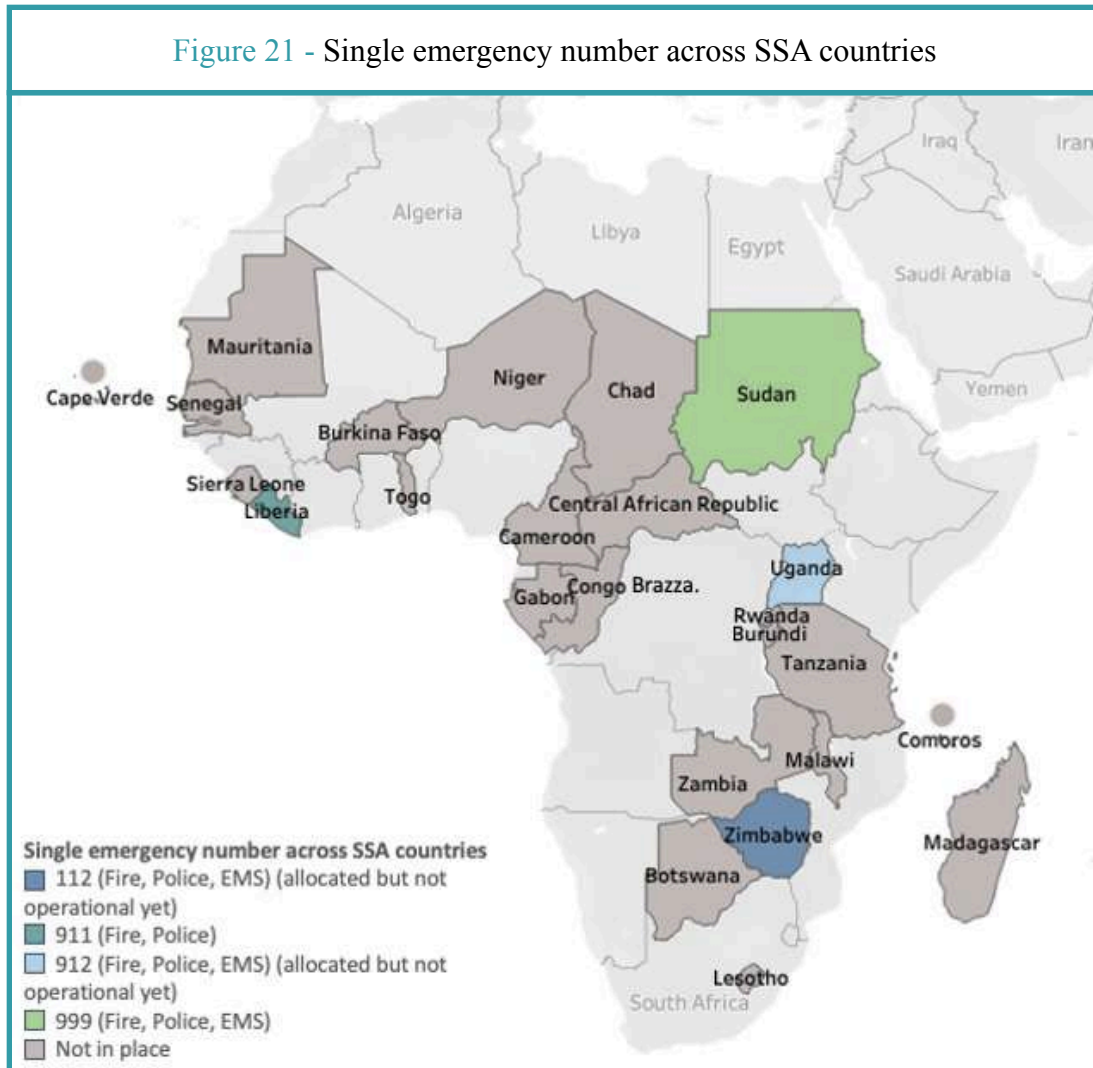
In two countries – Liberia and Zimbabwe, 112 or 911 is the single emergency number to access emergency services as specified in the ITU-T's Recommendation E.161.1. Liberia, however, did not include EMS in the designed single emergency number system. Sudan and Uganda use single numbers to call in the event of an emergency (999 and 912) for which there is no in-built feature to enable emergency calling in GSM/UMTS system.

In the group of SSA countries with a single emergency number system, the authors did not find a secondary emergency response number in addition to the primary number, to which all emergency calls are re-routed. However, certain SSA countries that consider the implementation of the single emergency number choose to continue with the current emergency numbers as secondary emergency numbers.

The apparent uniformity of country emergency services and the allocated emergency numbers across SSA countries is misleading (see Table 27). Currently, Chad, Congo Brazzaville, Mauritania, Niger and Togo did not allocate emergency numbers to call in the event of a medical emergency. EMS has also not been assigned to the existing emergency numbers as a complementary service, as in the case of other safety services. In most SSA countries, there are different emergency communication and response systems in place for EMS, police,

fire or civil protection which are currently accessed through different numbers. Several countries have also notified helpline numbers for assistance to special category of citizens like "Children Helpline". In addition, several public and private EMS providers and hospitals have also set up their separate help lines for medical emergency. At the same time, the authors did not find regulations for situations where multiple emergency agencies need to be contacted, as well as for jurisdictional issues that arise in such cases.

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## Box 20 - Botswana's Numbering Policy

In the context of the 112 integrated service, the drafted Botswana Numbering Policy discusses, as one of the basic options for the future, the promotion of 112 as the single emergency number, retaining 997, 998 and 999 indefinitely, but having them routed to the same points as 112. It was concluded that this option has considerable merit and this view is supported by stakeholders. In fact, continuing to reserve 997 and 998 for this purpose prevents the entire range from 997 XXXXX to 999 XXXXX being used for other purposes, a total of 300,000 numbers. A judgment therefore must be made by the Botswana Communications Regulatory Authority (BOCRA) whether these numbers are likely to be needed in the long term for other purposes. If there is concern that it unnecessarily sterilizes 300.000 numbers, a solution would be to monitor the number of calls to 997, 998 or 999 in about 5 years' time and if no calls are made over a 12-month period then the numbers could be withdrawn. Such a test could be repeated in a further 5 years if there were still calls.

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The allocation of emergency service numbers is realized by the Communication Regulatory Authority or by the authority responsible for

telecommunications field, after fulfilling a set of conditions (see Table 28).

Table 27 - Emergency service numbers in use in SSA countries

| Country | Number | Service | Country | Number | Service |
|---------|--------|---------|---------|--------|---------|
| Botswana | 112 | Emergency | Burundi | 112 | Police |
|  | 997 | EMS |  | 113 | Civil Protection |

| | | | | | |
|---|---|---|---|---|---|
| | 998 | Fire | | 116 | Child Helpline |
| | 999 | Police | | 117 | Hospitals |
| Burkina Faso | 17 | Police | Cabo Verde | 130 | Hospitals |
| | 18 | EMS | | 131 | Fire |
| | 112 | Fire | | 132 | Police |
| Central African Republic | 117 | Police / EMS | Chad | 17 | Police |
| | 118 | Fire | | 18 | Fire |
| | | | | 2020 | Police |
| Cameroon | 113 | Fire | Comoros | 111 | Civil Protection |
| | 117 | Police | | 112 | Fire |
| | 119 | EMS | | 115 | Hospitals |
| | | | | 118 | Police |
| | | | | 119 | Gendarmerie |
| Congo Brazzaville | 112 | Constabulary | Gabon | 18 | Fire |
| | 116 | Child Helpline | | 1300 | EMS |
| | 117 | Police | | 1710 | Gendarmerie |
| | 118 | Fire | | 1722 | Police |
| Lesotho | 121 | EMS | Madagascar | 115 | EMS |
| | 122 | Fire | | 117 | Police |
| | 123 | Police | | 118 | Fire |
| Mauritania | 17 | Fire | Niger | 15 | AIDS Helpline |
| | 18 | Police | | 17 | Police / Emergency |
| | 116 | Gendarmerie | | 18 | Fire |
| Rwanda | 112 | Fire / Police | Senegal | 17 | Police |
| | 116 | Child Helpline | | 18 | Fire |
| | 912 | EMS | | 1515 | EMS |
| Togo | 117 | Police | Uganda | 112 | Police / Fire |
| | 118 | Fire | | 116 | Child Helpline |
| | 171 | Police | | 911 | EMS |
| | 172 | Gendarmerie | | 999 | Police / Fire |
| | 1011 | Child Helpline | | | |
| Zimbabwe | 112 | All Emergencies | Zimbabwe | 993 | Fire |
| | 114 | Police / Emergency | | 994 | EMS |
| | 116 | Child Helpline | | 995 | Police |
| | 119 | EMS | | 999 | General Emergency |
| Tanzania | 112 | Emergency / Police | Zambia | 991 | Police |
| | 114 | Fire | | 992 | Hospital |
| | 115 | EMS | | 993 | Fire |
| | 116 | Child Helpline | | 999 | General Emergency |
| Sierra Leone | 019 | Fire | Malawi | 118 | EMS |
| | 999 | Police / EMS | | | |

Table 28 - Emergency numbers assignment regulations

| Regulation | Countries |
| --- | --- |
| Eligibility to apply for numbering resource (e.g. with a specific focus on emergency services) | Botswana |
| | Comoros |
| | Rwanda |
| | Senegal |
| | Tanzania |
| | Togo |
| | Uganda |
| | Zambia |
| Application process for an allocation of numbering resources | Botswana |
| | Burkina Faso |
| | Burundi |
| | Cameroon |
| | Central African Republic |
| | Chad |
| | Gabon |
| | Lesotho |
| | Rwanda |
| | Tanzania |
| | Togo |
| | Uganda |
| | Zambia |
| Assessment criteria for an allocation of numbering resources | Botswana |
| | Burundi |
| | Cameroon |
| | Central African Republic |
| | Chad |
| | Gabon |
| | Lesotho |
| | Rwanda |
| | Tanzania |
| | Togo |
| | Uganda |
| | Zambia |
| Regulatory fees for managing numbering resources | Botswana |
| | Burkina Faso |
| | Chad |
| | Gabon |
| | Lesotho |
| | Rwanda |
| | Tanzania |

Togo

Uganda

Zambia

Zimbabwe

All SSA countries report that assignment of short codes for emergency services does not impose fees on the caller, although in some cases, fees do get charged to the call center operators, depending on the regulatory regime in place for fixed and mobile phone operators. For example, in Zambia, the Information and Communications Technology Authority established in 2018 exempted agencies and organizations responsible for national emergency and safety of life services (i.e. Police, Disaster Management and Mitigation Unit, Ministry of Health, Zambia Flying Doctors, Fire Services) from class or individual frequency and/or numbering assignment. At the same time, according to the regulation in force, institutions qualified to be exempted from paying for frequency and/or numbering assignment are not exempted from the requirements to apply to the Zambia Information and Communications Technology Authority (ZICTA) for the use of necessary frequency and/or numbering spectrum.

In Comoros, in addition to existing requirements, any organization wishing to use a short emergency number should contact the General Secretariat of the Ministry of Internal Affairs for approval. Similarly, in Senegal and Togo, certain special numbers are assigned exclusively at the request or with authorization of the competent ministerial department.

Network operators (voice and data) licensees are obligated to provide access to emergency services free of charge to callers. At the same time, these cannot be subject to repayment in terms of interconnection. Tanzania, through the Universal Communications Service Access Act (2006), established a legal framework for universal service providers to meet the communication needs of consumers. Thus, the established UCSA Fund had the responsibility to (i) specify the universal service obligation by defining a set of communication services that all users should have access to at an affordable price, and (ii) designate universal service providers with the obligation to provide universal service.

In a group of SSA countries, the EMS providers set up their helplines for emergency medical services (see Table 29). Togo Assistance 8200 represents a special number due to the National Numbering Plan establishes short codes (four digits) for special services all the numbers starting from 82 to 89. In Botswana, all operators provide calls to MedRescue, a private EMS provider, on the emergency number 911. Calls to 911 are required by the operators' licenses to be free of charge to the user. MedRescue's services are generally available only to those who choose to subscribe to them, and it would therefore be inappropriate from a public policy perspective for the costs associated with its operations to be borne by telephone users in general. Thus, while calls to 911 are free to the user, there should be commercial arrangements between the network operators and MedRescue which ensure that the costs are met by the last one. Currently, the license of the network operators defines the emergency organizations to which calls can be made free of charge, including medical and veterinary services "whether such emergency organizations are owned and managed on a private or public basis". It is a matter of public policy for Botswana whether it is appropriate to continue to provide this facility for private medical and veterinary services. At the same time, no provision has been made in the drafted Numbering Plan for the continued use of 9XX for Emergency Services.

Table 29 - Other helplines for emergency medical services across SSA countries

| Country | Number | Service |
| --- | --- | --- |
| Botswana | 911 | MedRescue (private EMS provider) |
| Congo Brazzaville | 1213 | General Hospital Elbo d'Oyo |
| Gabon | 1333 | EMC Service of the National Social Security Fund |
| Gabon | 1334 | EMC Service of the Army Instructions Hospital Omar Bongo Ondimba |
| Gabon | 1466 | EMC Service of the Army Teaching Hospital Omar Ondimba |
| Togo | 8200 | Togo Assistance (private EMS provider) |

Most SSA countries with multiple emergency numbers report the development of plans and policies to introduce the single emergency number taking into consideration the relevant ITU-T Recommendations (see Figure 21).



Figure 22 - SSA countries to implement the single emergency number
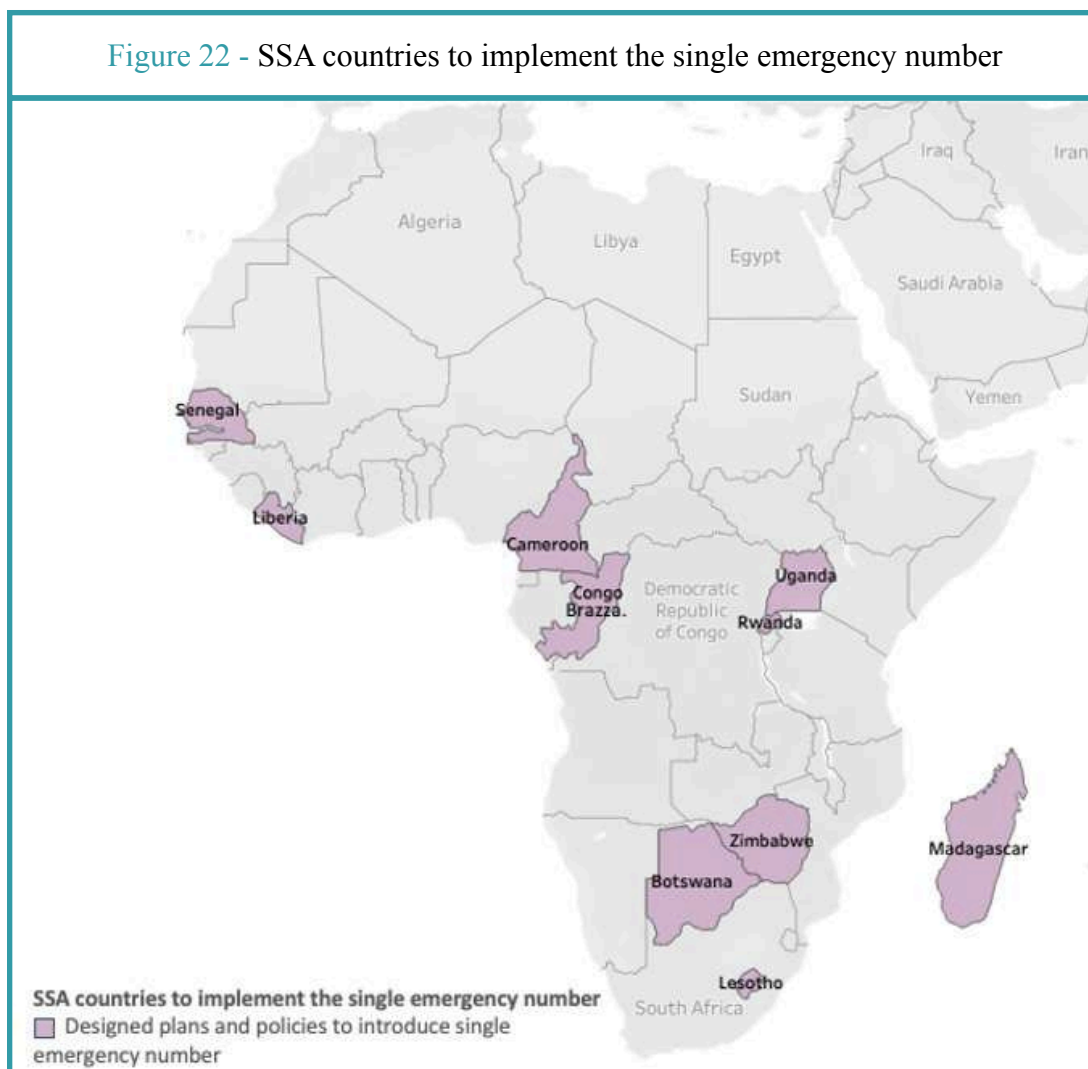
There are a limited number of SSA countries that have deployed SMS or mobile applications as complementary communications that respond to an emergency call. Lesotho, Madagascar and Sudan report initiatives to develop pilot projects that use the above-mentioned communication technologies to alert emergency services. Rwanda reports utilization of RapidSMS for pregnant women to complement the transmission of information in the event of medical emergency (see box below). However, the authors did not find a basis of requirements for the use of SMS taking into consideration the limitations of the SMS service, namely – (i) information is not provided by the network and it is routed via a different path other than the voice service; and (ii) absence of guaranteed real time delivery and bilateral real-time exchange. In Uganda, a project launched with the support of Korean Federation for International Healthcare uses SMS to communicate with emergency services in Masaka and Bukomansimbi districts. Similarly, it appears that the use of SMS is considered for specific situations (e.g. users with special needs) in order to enhance the efficiency of answering services and emergency teams, but not to replace the basic voice communication.

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### Box 21 - Rwanda's RapidSMS

RapidSMS was established by the Rwandan Ministry of Health in 2009 to help support expectant mothers by encouraging them to seek medical attention to reduce maternal mortality. It helps to "track pregnancies, report on danger signs during pregnancy, and subscribe to emergency alerts to ensure that women can access emergency obstetric care if complications occur. It has been known to reduce transit time to health centers during emergencies. Every community health worker (CHW) has a list containing all the women of childbearing age (15 to 49) in their village. If a woman shows pregnancy signs, they recommend visiting a health center. Once a pregnancy is confirmed, the CHW sends an SMS containing the details of the pregnant woman including weight, previous pregnancies and check-up dates to a central database where an individual record is created for all healthcare professionals to share. When check-ups are due, an SMS is sent to the health worker who then informs the expectant mother to attend.

- Ventures Africa, February 2016

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Togo Assistance, a private EMS provider, uses in its service the mobile application "Alerte Sinistre" to contact in the event of a medical emergency. The Botswana Institute of Technology and Research is currently piloting a mobile application for emergency services. The application is compatible with the utilized technologies in emergency communications.

Countries have yet to deploy or integrate Voice over Internet Protocol (VoIP) technologies in EMS dispatch or network communications. However, there are a number of advantages to adopting VoIP as a platform to consolidate the provision of

the emergency calls, including short numbering, adequate origin-dependent routing, charge or cost savings, and transmission of additional digital data and information, as a reference requirement in the planning of future communication systems based on VoIP. For example, the drafted Botswana Numbering Policy mentions that a VoIP operator, categorized as Publicly Available Telecommunications Services, is subject to the same conditions as an established operator, including an obligation to handle emergency calls.

Technical, operational and regulatory requirements for emergency communications is detailed below through a focus on aspects including service provision and end-user related requirements; requisite terminal equipment; the telecommunication network and interconnection protocols, the public safety answering points

(PSAPs) functionality, as well as transit networks and network management requirements.

Botswana, Liberia, Niger, Rwanda, Senegal, Sierra Leone, Sudan, Togo, Zimbabwe report that any telephone users can make a basic call to the appropriate emergency service whenever necessary without imposing undue constraints on terminals, networks or service providers. Additionally, in Liberia, Niger and Sudan, network access points enable the emergency call even when normal Originating Telecommunications Services have been barred (e.g. non-payment of bills, etc.) and/or the individual using a mobile phone for an emergency call is outside the coverage area of home network, provided that the area is covered by another mobile network operator and that the mobile phone is technically compatible with the alternate network (see Table 30).

Table 30 - Conditions for telephony terminal equipment to enable emergency call

| Condition | Countries |
|---|---|
| Normal Originating Telecommunications Services have been barred | Liberia Niger Sudan Zimbabwe |
| Equipment (e.g. USIM) is protected by an authentication procedure, unknown to the user | Botswana Liberia Zimbabwe |
| Mobile phone is outside the coverage area | Liberia Niger Sierra Leone Sudan Togo |
| An inactive SIM | Botswana Liberia Togo Zimbabwe |
| A handset without a SIM | Botswana |

> **Box 22 - Calling Line Identity (CLI) number, Automatic Number Identification and Automatic Location Identification**
>
> Allows identification of the caller and their location, which is critical for emergency services. These systems features are applicable to telecom service providers and the capacity to manage the transferred information relies on equipping of PSAP and/or ECC with the requisite hardware and software.

Recognition and treatment of emergency calls by means of the emergency call number by the originating network is also reported in Botswana, Comoros, Congo Brazzaville, Cameroon (not yet operational), Madagascar (not yet operational), Rwanda, Sierra Leone, Sudan, Uganda. Further, in certain countries from this group, in order to help the operations of the emergency services, each emergency call is accompanied with the Calling Line Identity (CLI) number, Automatic Number Identification and Automatic Location Identification, also known as ANI/ALI When emergency calls are made from mobile phones operated without a USIM card and the CLI cannot be determined by the originating network, as in the case of Botswana, alternative information can be transmitted by the originating network according to national regulatory requirements. In Botswana, the limitations to transfer the emergency call received from the originating network together with the call-related additional information immediately and without modification to the PSAP are due to the lack of hardware and software at the ECC or PSAP. Thus, currently EMS uses a standard wire line to receive emergency calls.

Other SSA countries do not report systems with features of transmission of basic information like location details and subscriber identity by the originating network to the PSAP, thus reducing their effectiveness to a large extent. Further, these systems are primarily focused at responding to emergencies.

Burkina Faso, Cameroon (not yet operational), Chad, Lesotho, Madagascar (not yet operational), Mauritania, Senegal, Sierra Leone, Togo, Uganda, Zimbabwe all require that telecom network operators give priority to emergency calls over all other calls. In case of fixed-line networks, priority is given from the network access point from which the emergency call is made. In case of mobile networks, priority is given from the Mobile Switching Centre (MSC). By contrast, in Botswana, where this systems feature is not adopted by network operators, there are reports of difficulties in accessing emergency lines when they are busy or flooded with other calls.

Further, the network management support functions for delivery of emergency calls to PSAPs were also analyzed. Only four SSA countries (i.e. Cameroon, Chad, Zambia and Lesotho) report existing regulations and/or launched initiatives to develop legal responsibilities for the terminating network and the PSAPs to permanently monitor the functionality and transmission quality of the transmission lines. In Zambia, ZICTA has the responsibility to carry out periodic performance monitoring of a universal service provider in order to ensure that the performance of the universal service provider meets the designated levels of performance, as well as to revoke the designation of that provider as a universal service provider when it has not met the levels of performance required by the authority.

# III. EMS Dispatch and Control

Establishing a minimum regulatory standard according to which all callers requesting emergency medical assistance from any area or jurisdiction within the country have direct access to an authorized emergency medical answering and control provider and to qualified emergency medical dispatch personnel. Different institutional arrangements for operation of the public safety answering points (PSAPs) and emergency control call centers can be distinguished, although the lines between them cannot be sharply drawn.

In some SSA countries (Cameroon, Senegal, Rwanda and Uganda) emergency answering points and control centers are under the same organization. In Senegal, the Emergency Medical Care Service (EMCS) has a national level Call and Emergency Control Center which is interconnected with the PSAPs of the Fire Service, Police and Gendarmerie. According to regulations in force, a call in the event of a medical emergency received by PSAP of the Fire Service is automatically transferred to the Call and Emergency Control Center of the EMCS. At the same, when an emergency event requires the concomitant medical and rescue intervention, the EMCS transmits the information to the Fire Service. Similarly, in Rwanda, a single Emergency Control Center operates at national level. In Cameroon, the Call and Emergency Control Centres of the EMCS are organized at regional level. Thus, each of the ten operational units of the Emergency Medical Care Service shall include a Call and Emergency Control Center. Uganda reports the piloting of a Call and Emergency Control Center in Kampala Metropolitan area. In Botswana, there is no centralized call center for EMS. The eight EMS centers in the country use eight different call answering points that use

telephone landlines. All existing Fire stations have separate call answering points. The Police have its own PSAPs. The National Disaster Management Office does not have a call answering point but plans to establish an emergency operations center. PSAPs and/or ECCs regional and sub-regional coverage level is also reported in Niger and Sudan.

After notification that a call has been received, the next component is the pathway of the emergency call. There are a variety of pathways for the emergency call from EMS caller to emergency team dispatch in SSA countries (see Table 31). In most cases the direct scheme is applied. Thus, the PSAP/ECC answers the phone, acquires all information from the caller, and then directly dispatches the necessary response units. In few cases the following schemes are reported: (i) transfer (PSAP answers the phone, asks pertinent questions and transfers the call directly to the appropriate responding agency); (ii) relay (PSAP answers the phone, acquires all necessary information from the caller and then relays the message to the appropriate agency) and (iii) referral (PSAP answers the phone, asks pertinent questions, such as the nature of the emergency and location, and then advises the calling party of the proper number to call).

Table 31 - Emergency call pathway schemes used by PSAPs

| Emergency call pathway scheme | Countries |
| --- | --- |
| Referral | Burundi |
| | Lesotho |
| | Liberia |
| | Sierra Leone |
| | Togo |
| | Uganda |
| Relay | Burkina Faso |
| | Burundi |
| | Lesotho |
| | Togo |
| Transfer | Congo Brazzaville |
| | Mauritania |
| | Sudan |
| | Togo |
| | Zimbabwe |
| Direct | Botswana |
| | Burundi |
| | Cameroon |
| | Congo Brazzaville |
| | Lesotho |
| | Liberia |
| | Madagascar (not yet operational) |
| | Niger |
| | Rwanda |
| | Senegal |
| | Sudan |
| | Togo |
| | Uganda |

SSA countries that report a state/regional-level or multi-disciplinary organization that works towards overall coordination and control of authorized PSAPs and ECCs include Cameroon's National Coordination Committee of the EMCS, Lesotho's Disaster Control and Relieve Office, and Senegal's National Council for Emergency Medical Care and Medical Transportation.

The PSAP and ECC field is generally governed by a weak legal and policy framework. In Senegal and Cameroon, the legal provisions cover the

establishment of the Call and Emergency Control Centers. In Niger, the regulations cover primarily PSAP/ECC personnel issues, while in Lesotho they cover primarily organizational issues. In Senegal, all personnel and providers having responsibility for emergency call answering and coordination must comply with national SOPs. Moreover, Senegal developed separate procedures for calls in the event of medical emergency and crisis or disasters. By contrast, in Zimbabwe only institutional level SOPs are applicable. The paucity of provisions has been identified regarding SOPs for PSAPs and/or ECCs across SSA countries. Consequently, Lesotho and Togo report utilization of different schemes for the emergency call pathway, depending on the officer on duty and PSAP organization, respectively.

The survey did not include standards or regulations on PSAP and/or ECC telecommunications and recording equipment for communications and dispatch operations. However, landline telephone systems and cellular telephone systems are reported to be the most utilized technologies within PSAP and/or ECC across SSA countries (see Table 32).

Table 32 - Type of communications technologies used at PSAP and ECC level

| Communications technologies | Countries |
| --- | --- |
| Land mobile radio systems | Lesotho |
| | Rwanda |
| | Senegal |
| | Sierra Leone |
| | Sudan |
| | Togo |
| | Uganda |
| Landline Telephone Systems | Botswana |
| | Comoros |
| | Lesotho |
| | Niger |
| | Rwanda |
| | Senegal |
| | Togo |
| | Uganda |
| | Zimbabwe |
| Cellular Telephone Systems | Burundi |
| | Comoros |
| | Congo Brazzaville |
| | Lesotho |
| | Liberia |
| | Mauritania |
| | Niger |

|  |  |
|---|---|
|  | Rwanda |
|  | Senegal |
|  | Togo |
|  | Uganda |
|  | Zimbabwe |
| WIFI Systems | Togo |
|  | Zimbabwe |
| IP Data Networks/Fiber Optic Connections | Togo |
|  | Zimbabwe |
| Land Mobile Satellite Communications | Lesotho |
|  | Togo |
|  | Zimbabwe |

---

### Box 23 - Computer-Aided Dispatch Systems

Computer-Aided Dispatch (CAD) is a method used by dispatchers to alert, track and coordinate emergency response personnel, vehicles and resources, both during and between response operations. CAD systems allow improvement in response times and communication between the public and EMS. CAD systems are comprised of several information and communication technologies (ICT) hardware and software components, and can vary in complexity from basic two-way radio communications to complex software suites that communicate with mobile data terminals (MDT) carried in multiple response fleets and tracked in real-time through GPS. CAD systems are typically comprised of the following components:

· Call input - A method for dispatchers to record and input relevant data obtained from the reporting party
· Call dispatch - A method for dispatchers to prioritize call urgency, alert responders that their assistance is needed, and relay the relevant data obtained from the reporting party to them
· Status monitoring - A method for dispatchers to map and track the status and location of emergencies, responders and response units
· Coordination - A method for dispatchers to communicate and coordinate with and between responders and response units in one or more agencies – for example, between three ambulances from the same EMS provider, or between EMS, fire and/or police
· Documentation – A method for dispatchers to record and document event notes
· Disposition – A method for dispatchers to record and document event outcomes

The composition and sophistication of CAD systems can vary greatly, dictated largely by the local availability of existing ICT solutions, the expected and projected demand for EMS assistance, and budget. In high-income countries, the use of CAD systems to manage EMS first began to proliferate in the 1960s and 1970s. Two principal factors determined the design of CAD systems at the time: The general absence of central government oversight of EMS and the limited and varying availability of ICT solutions at the local levels. The result was the development of hyper-local CAD systems that were focused on dispatching a limited number of ambulances and often lacked inter-operability with neighboring EMS systems and even between emergency response agencies in the same municipality. In other words, these "legacy" CAD systems were not built with mobile phone networks in mind.

In SSA, the rapid emergence and penetration of mobile phone networks, and the general lack of "legacy" CAD systems already in use, creates a unique opportunity to learn from these experiences and use them to innovate new and improved dispatching solutions that are better tailored and more accessible for SSA. Neither of the two primary drivers of legacy CAD system design should be major concerns in SSA: mobile phone networks are widely available and accessible, with Internet access consistently increasing, making it more practical to design CAD solutions that cover larger areas with more efficiency and economy. While there is still much work to be done in this area, several trends in SSA have already begun to emerge that differ greatly from the conditions present when high-income countries began designing CAD solutions:

· Radio networks are not widely available in SSA, while mobile phone and internet networks are nearly ubiquitous
· Landline communications are the exception, not the norm
· The availability and condition of road networks in SSA are considerably different than in high-income countries making ambulance-only response schemes less practical in SSA

# IV. Interagency Communication for EMS

The EMS interoperability framework – that is, interoperability of communications and standards between public safety agencies – was analyzed across SSA countries. Most SSA countries report that EMS communication systems provide a means of communication to enable medical and logistical coordination between EMS field personnel, emergency department and other public safety agencies. For example, in Liberia, these are still in early stages and are non-

standardized. Communication among all public safety agencies and between PSAP and all public safety agencies are the most frequently identified formal communication paths established in the emergency systems (see Table 33). In Cameroon, the technical documentation on EMS system reorganization recommends that regional EMCS units must be interconnected to ensure a permanent medical coordination of the network of the EMS providers within the catchment area. It is reasonable to conclude that there is an almost universal need for interoperability among EMS providers – PSAPs/ ECCs – and hospitals across SSA countries.

Table 33 - Formal communication paths established in EMS systems

| | PSAP – all PSAs | Com. b/w all PSAs | FR team to amb. | FR team to disp. | FR to med. ctrl. | ECC/Med. ctrl to amb. | Amb. to disp. | Amb. to amb. | Amb. to hosp. | Hosp. ED to disp. | Hosp. to hosp. | Helico. to disp. | Amb. to helico. | Helico. to hosp. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BWA | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| BFA | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| BDI | - | - | + | - | + | - | + | - | + | + | + | - | - | - |
| CPV | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CMR | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CAF | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TCD | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| COM | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| COG | - | + | + | - | + | - | - | - | + | - | - | - | - | - |
| GAB | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| LSO | + | + | + | + | + | + | + | + | + | + | + | + | + | - |
| LBR | + | + | + | + | - | - | + | + | + | + | - | - | - | - |
| MDG | + | + | - | + | - | + | + | - | - | + | - | + | - | - |
| MRT | + | + | + | - | - | + | - | + | + | - | - | + | - | + |
| MWI | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| NER | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| RWA | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SEN | - | + | + | - | + | - | - | + | + | - | + | + | + | - |
| SDN | + | + | + | - | + | - | + | + | + | - | + | - | - | - |
| SLE | + | - | + | - | - | - | + | + | + | - | - | - | - | - |
| TGO | + | + | - | - | - | + | - | - | - | + | + | + | + | + |
| TZA | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ZMB | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ZWE | + | + | + | - | - | + | + | + | + | + | + | + | + | + |
| UGA | - | - | - | - | - | - | + | - | + | - | - | - | - | - |

Abbreviations: PSAs. – Public safety agencies; Com. - Communication; FR – First Responder; Amb. – Ambulance; Disp. - Dispatch; Med. ctrl. - Medical control; Hosp. - Hospital; Helico. - Helicopter

Only three SSA countries (Lesotho, Sudan and Senegal) report specific legal provisions regarding interagency coordination for emergency situations (e.g. notification regarding vehicle accidents, fire incidents, apparent hazards brought to the attention of the EMD, response for hazardous material incidents, etc.). All of the above mentioned SSA countries have also developed standards and procedures, both administrative and technical, for communications between emergency teams of different services while in the field and emergency teams of the same service while in the field.

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**Box 24 - Ambulance and Fire Service Communications in Senegal**

In Senegal, the EMCS and Fire Service interagency communication and cooperation is established by Government Decree. A call in the event of a medical emergency received by PSAP of the Fire Service is automatically transferred to the Call and Emergency Control Center of the EMCS. At the same time, when an emergency event requires the concomitant medical and rescue intervention, the EMCS transmits the information to the Fire Service. Further, formal communication paths are reported in the framework of ORSEC Plan realization. Thus, the regulatory framework addresses both day-to-day interoperability (coordination during routine public safety operations), mutual aid interoperability (joint and immediate response to crisis/disasters from numerous groups of public safety personnel) and task force interoperability.

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Senegal and Lesotho developed regulations and standard procedures for simultaneous dispatch to the scene of an incident of different emergency services or of multi-disciplinary teams. Moreover, in Lesotho, the procedures differ according to the type of emergency. In the case of a road traffic accident, the police should be notified first, then the paramedics intervene to bring the patients to hospital. In case of an obstetrical emergency, the passerby notifies the community health worker; in turn the community health worker notifies the health centers, which in turn notifies the hospital.

There are policy implications that should be considered to ensure interoperability experiences of public safety agencies and EMS providers across SSA countries, such as the need for improved coordination among all levels of government and the development of standards. Interoperability is not sufficiently addressed through regulations at all governance levels, both for current emergency communications and emerging communications systems. No SSA countries reports regulations in force regarding the utilization of frequencies specified as reserved for "Emergency Medical", suggesting that interoperability does not represent an essential communications requirement for EMS systems.

In all SSA countries, the Communication Regulatory Authority is responsible for the designation of radio frequencies. However, state

authorization for an EMS provider does not include the mandatory requirement to obtain a CRA license for radio frequencies (VHF and UHF channels) for EMS communications. Moreover, the survey did not indicate national or regional level EMS Communications Plans to establish standards of functional performance (i.e. standard EMS channels, etc.) and the inter-relationship with other types of communication systems that are used by non-EMS agencies and providers among SSA countries.

None of the authorities with responsibilities in the field of EMS and/or telecommunications also oversee or have responsibility for progress on the issue of interoperability, including how communications occur on a regional and statewide basis to avoid conflicts and allow for interagency communications.

Only Sudan reports the development of minimum technical standards for EMS to hospital communications and a reserved frequency for use only for communication between EMS providers and hospitals regarding provision of patient care. However, the surveys did not mention any technical standards for communications equipment (e.g. use of equipment that is capable of "scanning" or manually selecting other receiver channels, transmitter wattage or power output requirements, etc.) nor any relationship with the area's geographic specificity and performance metrics (e.g. communication shall be provided to at least 90% of the catchment area, 90% of the time).

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## Box 25 - Radio Communications Regulation in Tanzania

The Tanzania Communications Regulatory Authority (TCRA) have developed minimum technical specifications for Base Stations and Repeater equipment to be used in the public mobile radio communication and is in the process of setting requirements on EMS vehicle communications equipment for all stakeholder agencies involved in EMS delivery (i.e. ECCs, PSAPs, hospitals, etc.). This covers safety and health, technical, radio interfaces, electromagnetic compatibility and electrical safety requirements. The utilization of a base station or repeater equipment by an EMS provider or agency must comply with the International Commission on Non-Ionizing Radiation Protection guidelines for limiting exposure to time varying electric, magnetic, and electromagnetic fields (up to 300 GHz). Compliance with the above radiation safety standards does not by itself confer immunity from legal obligations and requirements imposed by national health or safety authorities. TCRA may invalidate the equipment registration if this is requested by the relevant authority for reasons of safety or hazards that would likely be caused to users. The base station and repeater equipment must operate within the frequency bands stipulated in the Table 32. These requirements are applied to demonstrate that that radio equipment effectively uses and supports the efficient use of radio spectrum in order to avoid harmful interference.

| Transmit Frequency | Receive Frequency |
|---|---|
| 925 MHz - 960 MHz | 880 MHz - 915 MHz |
| 791 MHz – 821 MHz | 832 MHz – 862 MHz |
| 1 805 MHz - 1 880 MHz | 1710 MHz - 1785 MHz |
| 2110 MHz - 2170 MHz | 1920 MHz - 1980 MHz |
| 2300 MHz – 2400 MHz | 2300 MHz – 2400 MHz |
| 2570 MHz – 2620 MHz | 2570 MHz – 2620 MHz |
| 2620 MHz – 2690 MHz | 2500 MHz – 2570 MHz |
| 3400 MHz – 3600 MHz | 3400 MHz – 3600 MHz |

A sizeable group of SSA countries (Botswana, Cameroon, Central African Republic, Lesotho, Madagascar, Niger, Rwanda, Senegal, Sierra Leone, Uganda, Zimbabwe, Zambia, etc.) indicate having stated requirements on communications equipment on EMS vehicles. These are not differentiated by type of EMS vehicle and do not include minimum technical standards regarding the primary and back-up equipment to be used. Botswana's MoH established requirements that authorized EMS vehicles shall be equipped with a two-way voice communication system (radio) or cellular phone for dispatch activities. In Uganda, the EMS vehicle communications requirements stipulate the equipping of ambulances with two-way radio (VHF channel) and cellular phones for communication between ambulances, dispatch and the receiving hospital. Similarly, in the case of Lesotho, Sierra Leone and Sudan, the EMS vehicles are required to have the technical capability to communicate with ECCs and/or receiving hospitals. At the same time, Lesotho reports that cellular phones represent the equipment for reliable voice communication from outside of the vehicle ("patient side") to hospital. In 2011, Zambia codified regulations on registration of electronic communication equipment for EMS vehicles. However, the survey did not show any references across SSA countries regarding EMS vehicle communications equipment performance targets – i.e. provision of reliable coverage to at least 90% of the geographic catchment area, 90% of the time, or similar policy or national target.

## Box 26 - International Telecommunication Union

The international standards established for the telecommunications industry and equipment should be understood as part of the technical requirements that are inherent to EMS Communication systems. As an example, base stations and repeater equipment must conform to any or a combination of the following:
-- Radio Interfaces standards and all applicable standards, namely – ETSI EN 301 502, ETSI EN 300 609-4, ETSI EN 301 908-01, ETSI EN 301 908-03, ETSI EN 301 908-11, ETSI EN 301 908-14, ETSI EN 301 908-15, ETSI EN 301 908-18, ITU-R M.1457-13, ITU-R M.2012-3
-- Electromagnetic Compatibility standards as specified in the IMT-2000 Third-Generation Cellular System specifications, namely - ETSI EN 301 489-1, ETSI EN 301 489-23
-- Electrical Safety standards – IEC 60950/EN 60950, IEC 60215/ EN 60215

In Zambia, the Information and Communications Technology Authority, under mandate of the ICT Act No. 15 of 2009, approved the regulations of (i) the utilization of radio spectrum, including the Industrial, Scientific and Medical bands, and (ii) operational and technical requirements for radio communication equipment or radio communication networks operating in the ISM bands. The Regulatory Guidelines establishes that ISM bands are reserved for use in industrial, scientific and medical applications, as well as are license-exempt bands or unlicensed bands because operation in these bands does not require a radio license. The Zambia National Frequency Band Plan which ranges from 8.3 KHz to 100GHz has allotted the ISM bands as shown in the Table 34.

Table 34 - ISM bands in Zambia

| ISM Bands | Centre Frequency | Available Spectrum |
|---|---|---|
| 6 765-6 795 KHz | 6 780 KHz | 30 KHz |
| 13 553-13 567 KHz | 13 560 KHz | 14 KHz |
| 26 957-27 283 KHz | 27 120 KHz | 326 KHz |
| 40.66-40.70 MHz | 40.68 MHz | 40 KHz |
| 433.05-434.79 MHz | 433.92 MHz | 1.74 MHz |
| 2 400-2 500 MHz | 2 450 MHz | 100 MHz |
| 5 725-5 875 MHz | 5 800 MHz | 150 MHz |
| 24-24.25 GHz | 24.125 GHz | 250 MHz |
| 61-61.5 GHz | 61.25 GHz | 500 MHz |

Sierra Leone reports a reserved frequency for use only for communication between EMS providers and hospitals regarding the provision of patient care. In addition, the National Telecommunication Authority has the right to establish technical standards applicable to telecommunications equipment to ensure against damage to telecommunications network or services or to public health, safety or the environment.

It appears that land mobile radio systems in the ECC context, which include the traditional VHF and UHF dispatch-to-vehicle (mobile and portable radios), vehicle-to-vehicle and vehicle-to-hospital communications, have a reduced utilization. It is not clear whether the movement towards more advanced technologies is due to proliferation of newer technologies to enhance EMS interoperability or to solving the existing public safety analog spectrum obstacles and limitations.

Four SSA countries (Comoros, Lesotho, Niger and Senegal) report the development of regulations on utilization by EMS vehicles of dispatch radio systems other than public-safety owned and operated equipment in a channel-sharing environment (i.e. cell phones, trunking systems, etc.). However, there are not any references, with few exceptions (i.e. Niger and Senegal), regarding the legal responsibility for EMS provider to maintain evidence of priority system access or to demonstrate system access on at least 99% of all transmission attempts. Trunked systems allow more efficient use of frequencies because a computer automatically searches for an open frequency when a call is made. Thus, the caller is not required to select a frequency manually each time, helping to prevent radio

frequency congestion and interference. It also allows less user intervention for its operation. However, the authors did not find designated public safety radio frequencies to be used in EMS trunked radio systems across SSA countries.
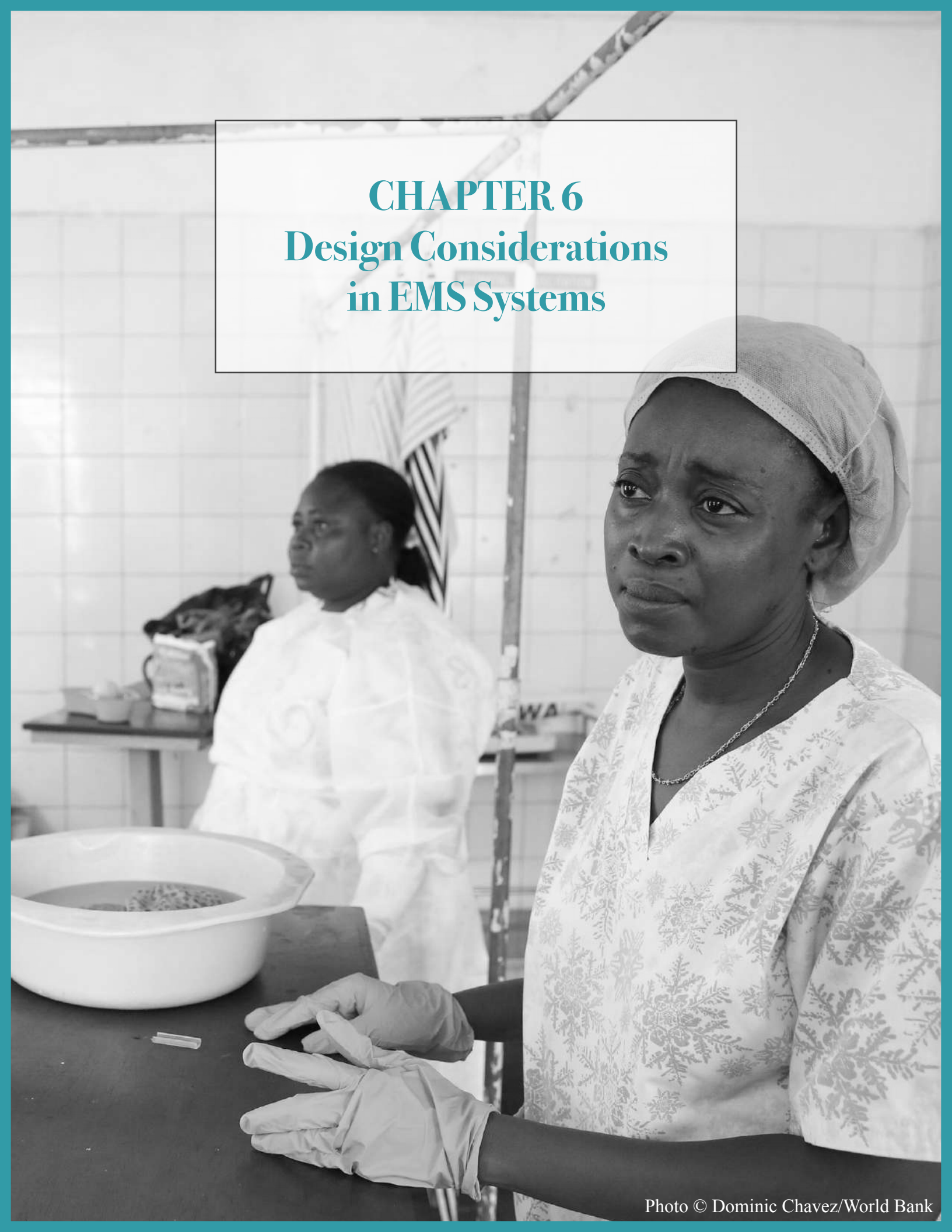
# V. Medical Control Communication

Four SSA countries - Lesotho, Senegal, Sudan and Uganda - report Medical Control, which consists of directions for pre-hospital treatment and care by a physician and carried out by first responders, including online and off-line supervision, as a component of the EMS pathway. Under current regulations, medical control has a limited role in designation and dispatch management for EMS vehicles to the scene, as well as patient transport to the receiving hospital. This suggests a need to strengthen the institutional framework for medical control operations. Consequently, it is difficult to establish accountabilities for medical control – the ECC or the receiving medical facility.

Lesotho and Sudan report the development of requirements on contacting Medical Control. However, these are not consistent in terms of establishing the (clinical) conditions and procedures when contact with medical control is needed or required.

Communication channels that permit the exchange of vital medical information between EMS responders and medical control is assured mainly through cellular phones (Lesotho and Uganda) and VHF radio frequencies (Uganda) and is also dependent on country needs and resources. However, the surveys did not indicate any requirements on voice communications between EMS responders and medical control related to patient care – i.e. all voice communications shall be electronically recorded and maintained for not less than 60 days. At the same time, Senegal and Uganda report the availability of other sources for medical control to query patient related information (i.e. Digital Health or eHealth systems).

# CHAPTER 6
## Design Considerations in EMS Systems

# CHAPTER 6: Design Considerations in EMS System

# I. Introduction

A fundamental challenge uncovered through this analysis is that a universal template for EMS communications system design does not appear to exist in any of the strategic approaches taken by SSA countries to date. To be truly effective, the establishment of a functional EMS system must address all key elements in a coordinated, wholistic manner, including: (a) first responder and rescue services; (b) pre-hospital ambulance services; (c) hospital-based emergency care, and, (d) the underlying communications, dispatch and information systems. It is important to acknowledge that, while pre-hospital EMS aspects are integral to post-crash and ambulatory care, there is little point in delivering a seriously injured or ill patient successfully to the hospital if emergency room facilities are not equipped to manage trauma cases. Conversely, well stocked hospitals with the most advanced trauma surgeons may still risk time, money and resources towards trauma patient outcomes that were compromised by improper handling or care after having been transported to hospital in the absence of ambulance services. Many trauma injuries often result from what happens to the patient after a road crash rather than from the incident itself, emphasizing the need to ensure greater continuity in the level of care. Moreover, this does not mean that every trauma facility receiving road crash victims needs to be equipped and staffed as a level 1 trauma center. Hospitals and clinics with even basic trauma care capability can contribute positively to saving lives and improving patient outcomes through modest, yet targeted investments in basic prehospital trauma care capabilities.

Since there are many ways of configuring EMS system elements, it is useful to first consider the relevant design parameters, such as:

- Scope of operations – service coverage and types of calls to be performed

- Size and locations of teams – how many teams are needed and where to place them

- Key functions and organizational options – legislation/regulations; organization and management, including clinical oversight, dispatch, fleet management, etc.

- Composition, organization and training of teams – number of team members, level of training (e.g., BLS/ALS), role of drivers (medically trained or not)

- Scope of public-private partnership – e.g., contracting out entire service or parts of it, contracting in management, etc.

- Implementation – "big bang" approach, gradual geographic coverage, etc.

In contrast to service delivery models (Anglo-American vs Franco-German), the models for organization, management and governance are numerous, and many different models have been shown to work

well if they are implemented with appropriate attention to incentives and accountability structures. Some common models include:

a.  Department within a state/province or national Ministry of Health;

b.  Department within the Ministry of Interior (often with the fire service);

c.  Operated by municipalities as a separate service;

d.  Operated by municipalities as part of the fire department;

e.  Operated by a non-profit or philanthropic society (e.g., Red Crescent Society in the Middle East and the Eidhi Foundation in Pakistan);

f.  Private operator

For model (a) and (c) some or all functions may be contracted out as part of a public-private partnership (PPP), either to for-profit or not-for-profit providers. Where services are contracted out, performance-based contracts are common, often with specific response-time and other metrics to meet contractual obligations, demonstrating its level of service capabilities as a preferred provider. Many government-run services also set their own performance expectations and report achievement relative to these standards[83].

The chapter presents two case studies that are intended to provide insights into how countries are approaching EMS system development. The first case study is a look at a pilot project that is currently underway in Malawi, with the support of a World Bank financed transport project. The second case study looks at an ambitious national effort to establish an EMS service in one of Africa's poorest nations, again with technical and financial support of the World Bank.

# II. Case Study 1

## Malawi "118" Emergency Medical Services – Post-Crash Response and Trauma Registry Pilots

The World Health Organization recently estimated that the mortality rate from road traffic injuries in Malawi was 31 persons per 100,000 population[84]. Nationally, road traffic related injuries contribute to six percent of all fatalities. Around half of all road traffic deaths occur at the scene of the crash,

but the outcome for the remaining 50 percent that survive are often affected by the quality and speed in delivering urgent care. A large proportion of these deaths and injuries could potentially be prevented through adequate medical care such as basic life support and rapid transport to a

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[83] See for example: http://www.londonambulance.nhs.uk/about_us/how_we_are_doing/meeting_our_targets/latest_response_times.aspx
https://www.ambulance.qld.gov.au/docs/QAS_PPI_3rd_Quarter.pdf
http://www.kingcounty.gov/depts/health/emergency-medical-services/~/media/depts/health/emergency-medical-services/documents/reports/2016-Annual-Report.ashx
[84] Global Status Report on Road Safety, World Health Organization. 2018

medical facility. Like much of SSA, Malawi has struggled to institute adequate post-crash systems confronting the all too familiar challenges of scarce human resources, unavailability of timely transport to hospitals, basic and necessary equipment and lack of training in trauma care.

The Health Sector Strategic Plan II (HSSP II) 2017-2022 outlines several objectives that focus on elements for "the effective, efficient and quality provision of health care interventions, namely human resources, infrastructure, medical equipment, medicines and medical supplies, information systems, governance and leadership and financing" that presents a medium term series of interventions. According to HSSPII, it acknowledges the following status for EMS:

"[…] referral services are weak and not well streamlined. There are limited resources and logistics for referral of emergencies. Almost all DHOs and Central Hospitals face critical shortages of standardized ambulances for emergency referrals. There is a serious lack of capacity to deal with any pre-hospital care in terms of available paramedics and ambulances. Training for paramedics in EMS is currently not available. A dedicated emergency response phone number and a coordinated call center to respond to emergency calls do not exist."

Yet it still aspires to a goal of reducing incidence and impact of trauma and related disabilities[85] in Malawi, one which is driven by effective policy action, targeted primary prevention interventions, effective emergency and rehabilitative services, strengthened research capacity, and effective advocacy.

The Government of Malawi, through the Ministry of Health and Population (MOHP), has therefore initiated a pilot program for the development of a "118" EMS Response Center. The overall objective is to initiate health and emergency systems that will respond to road traffic accidents (RTAs), with specific attention to communications, first responders, pre-hospital emergency medical services and in-hospital trauma care. The Pilot focuses on the M1 Road Corridor between Lilongwe and Blantyre[86] which records the highest rates of road trauma injuries and fatalities in Malawi. The pilot coverage area is served by a 118[87] call center, housed at the College of Health Sciences next to Kamuzu Central Hospital (KCH) in Lilongwe. The expectation is that all 118 ambulance responses are to be dispatched through the 118-emergency call centre[88].



Figure 23 - Malawi's Pilot Program

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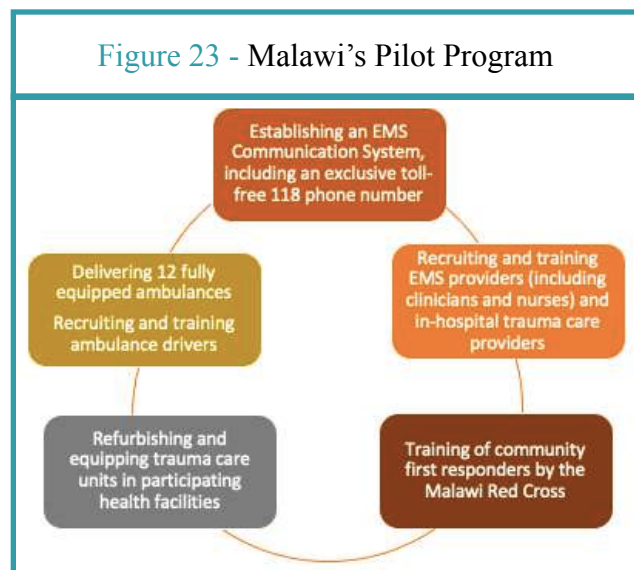
[85] While the monitoring and evaluation framework for HSSPII identifies reductions in road traffic fatalities as a key performance measures, targets were not identified at the time of publication.

[86] The pilot target area targets the following districts, Lilongwe, Dedza, Ntcheu, Balaka, Neno and Blantyre.

[87] 118 being the established toll-free Emergency number.

[88] 118 ambulance responses are restricted to the M1 highway with a 5-km buffer on both sides, so long as these roads are paved. 118 ambulances are not allowed to leave paved roads and/or travel more than 5 km away from the M1 in either direction, unless specifically directed by the call center manager. If patients call 118 requesting a response on unpaved roads and/or beyond the 5-km buffer zone, 118 dispatchers are instructed to coordinate an interception point along the M1 with the caller and communicate that location to the nearest appropriate ambulance crews.

**EMS Communication System.** Publicly accessible radio networks within the pilot program coverage area are limited to the Lilongwe and Blantyre vicinity; all other areas along the M1 highway involved in the pilot program are dependent upon mobile and landline telephonic infrastructure. Based on the limited distribution, accessibility, and reliability of radio vs. mobile networks in Malawi, the 118 call center was established through a cloud-based Computer-Aided Dispatch (CAD) System that relies primarily on the existing mobile phone networks to ensure the optimal coverage and accessibility.

The CAD system receives incoming calls made to the 1-1-8 short code emergency number via landline or cellular routes, which are then converted to Voice Over Internet Protocol (VoIP) communications. Once converted to VoIP, each call is then routed to, managed and prioritized via a call center management platform. The CAD system integrates a cloud-based call management platform (Twilio Flex, for the pilot program) which is integrated with a cloud-based ambulance dispatching software (Beacon Emergency Dispatch) that allows 118 dispatchers to alert, coordinate, dispatch and track prehospital providers via mobile phone communication, through both SMS text messages and push notifications. The Beacon dispatch platform caters to:

1. The determination of a dispatch priority
2. The dispatching of first responders, fire services (where available) and ambulance crews
3. Ongoing monitoring of calls as they evolve
4. Management of all available resources
5. Contact with health facilities
6. The dispatching of multiple responders and various types/categories of responders

The EMS communications system requires the availability of high-speed internet for the dispatch center (preferred at 100mbps, though functional as low as 10mbps), a local SMS gateway to ensure communications accessibility for responders using SMS, phone data plans for the 25 smartphones provisioned for the ambulances, as well as for 500 feature phones to communicate with community-level first responders.



Figure 24 - Balaka Ambulance -- Beacon Emergency Dispatch Mobile Application
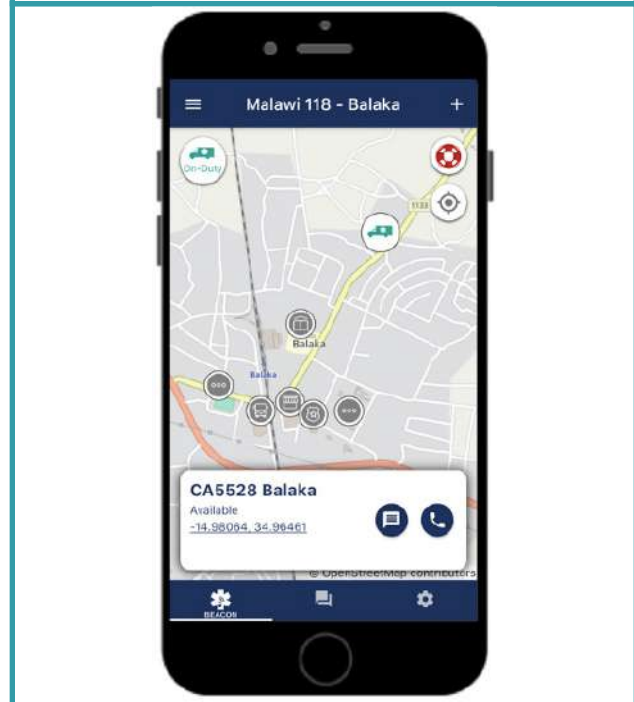
*Source: Trek Medics International*

**Fully Equipped BLS Ambulances.** For the Malawi ambulance dispatch pilot, twelve (12) ambulances were procured through UNOPS and subsequently branded. Additional equipment

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[89] Head stabilizers, Short stabilizing spinal board, spinal board strapping, oxygen resuscitator, portable automatic resuscitator, pulse oximeter, mattress for stretcher, oxygen resuscitator demand type, trauma kit, portable suction, emergency blanket, stethoscope

and medical kits were also supplied[89]. All emergency vehicles have been equipped with GPS tracking capabilities that supports dispatch and monitoring of ambulance movements.

**Trauma Care Centers.** Public health facilities are to be upgraded to provide incoming triage space and medical equipment at six locations, including the two central hospitals (Kamuzu Central Hospital in Lilongwe and Queen Elizabeth Central Hospital in Blantyre), three district hospitals (Dedza, Ntcheu, and Balaka) and one community hospital (Lisungwi). The upgrades to existing fixed medical facilities will include adequate theatre space for emergency care and requisite trauma equipment and supplies that are vitally important for the treatment of life-threatening injuries. In addition, staff were to be trained in Advanced Trauma Life Support procedures and in the use of new equipment.

**Training of Community First Responders**. All first responders are members of the local communities through which the M1 road runs and included as part of the pilot EMS corridor. With the support of the Malawi Red Cross Society all first responders were provided basic EMS training that would allow them to be certified by the Malawi Red Cross. First responders are also provided a simple phone capable of SMS text messaging to communicate with EMS Dispatch Center during incident management and ambulance movement.

**Training of EMS Providers.** Initial training of xx EMS providers was done by the Malawi College of Health Sciences. The training included not only trauma care but also the management of medical and obstetrical emergencies as well. Both in order to speed up the training and to deal with the fact that Malawi did not have paramedics as a recognized cadre of health providers, existing clinical staff were selected for the training. Communications training for responders was provided at various stages, and in differing capacities. An initial

introduction to the communications software was provided to ambulance personnel at the end of the formal dispatcher training course. Subsequent trainings were carried out on-site by call center management for ambulance personnel and community responders. For ambulance personnel, it was made evident that communications training was required for drivers only – if the ambulance had four staff, three of which were medical professionals, it was only necessary for the driver to manage and operate the communications system on the ambulance-issued smartphones via the Beacon mobile app and SMS for when internet connectivity was not available. For community first responders who effectively operate as independent response units, it was necessary for each of them to learn how to receive and reply to emergency alerts and other communications via SMS on their personal feature phones.

**Training of Dispatchers.** Dispatcher training consisted of an initial week of lecture and computer-based simulation training, followed by ongoing in-service training. The topics included in the initial training covered five modules:

1. Introduction to Emergency Medical Services and Emergency Medical Dispatching
   a. Purpose and makeup of Emergency Medical Services
   b. Roles and responsibilities of Emergency Medical Dispatchers

2. Call Intake
   a. Call Interrogation
   b. Triage

3. Resource Allocation
   a. Priority Dispatch
   b. Response Levels
   c. Local Resources
   d. Field Operations
   e. Network Coordination

4. Emergency Care Instructions
   a. Provide pre-arrival instructions
   b. Chief complaint-based management
   c. Special Circumstances

4. Record Keeping
   a. Documentation and Reporting
   b. Quality Assurance / Quality Improvement
   c. Backup Systems

During the practical training portions of the training program, dispatchers were first tasked with using physical maps of the target catchment areas to identify, mark up, and memorize all major landmarks, intersections, feeder roads, zones and other points of interest in order to familiarize themselves thoroughly with the area of responsibility and be able to quickly identify specific locations that would likely be reported to them by reporting parties. Given the relative lack of physical street addresses in Malawi, particularly in rural areas, dispatchers were trained to be able to elicit and identify likely incident locations. The trainees leveraged each other's personal knowledge of each district's most recognized points of interest in order to mark up the physical maps, which were subsequently hung on the walls above the call center's computers for easy reference. After the physical maps were completed, the dispatchers were then tasked with populating Beacon's computer-based maps using the graphical user interface and map editing tools.

Figure 25 - Beacon Emergency Dispatch Platform
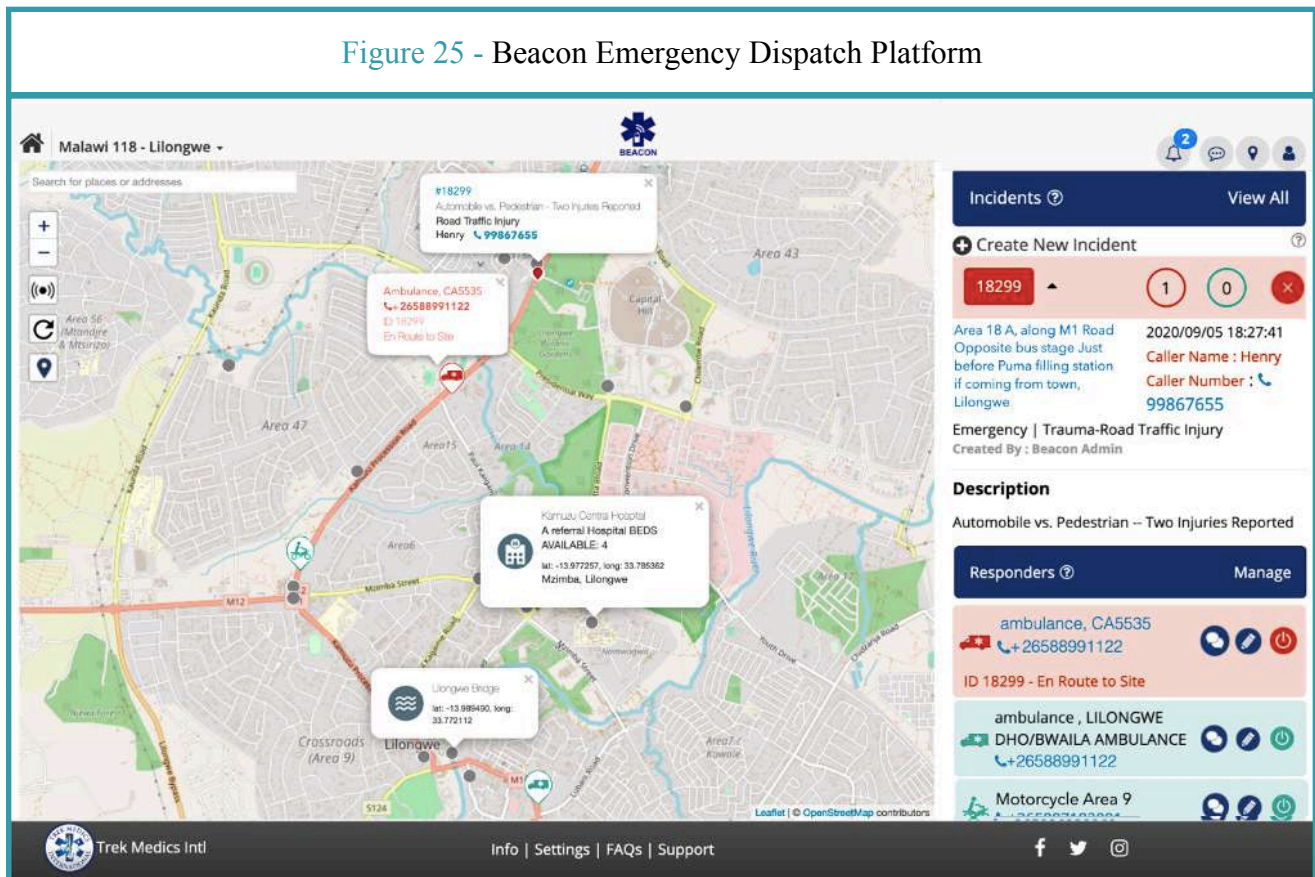


*Source: Trek Medics International 2020*

Practical training then moved on to live simulations, which included timed exercises of simulated calls: One trainee would be designated as the "Reporting Party" and would make a call to 1-1-8, which would be answered by a trainee playing the role of dispatcher. The dispatcher would follow their prompts and dispatch cards to complete the basic sequence of tasks, specifically:

- Obtain the caller's location
- Obtain the caller's name and number
- Obtain the chief complaint
- Determine the call priority (i.e., Red, Yellow, Green)
- Allocate and dispatch the proper emergency response resources
- Determine the need for additional resources (e.g., Fire
- Provide pre-arrival instructions where relevant
- Track and monitor resources

The live simulation training was carried out in successive levels of difficulty, where reporting parties became increasingly difficult on the phone, in order to replicate the real-life distress that reporting parties are often under when calling emergency assistance. Each simulation was also timed in order to emphasize the necessity of rapid call interrogation and dispatch, with an objective of determining the call priority and begin dispatching within 30 seconds. Additional emphasis was put on providing dispatchers with the skills necessary to maintain control of the conversation and remain detached from, and impartial to, the emotional state of the reporting party.

**EMS Operations Manual.** Governance and administrative procedures for managing the EMS services were set out in an Operations Manual. By defining the institutional mandates and roles among various actors, the Operations Manual is intended as a living document that can provide guidance and information for decision making on functional aspects of the entire EMS system. Further, it provides the templates and checklists that conform to international good practice and local standards, such as personnel skills and training requirements, fleet management protocols (for monitoring ambulance usage and maintenance), and medical equipment and supply inventory management, among other aspects.

**Trauma Registries.** The MOH also seeks to improve the quality of collected data on trauma. Malawi utilizes a national Health Management Information System (HMIS) that registers every admitted patient in the hospital. However, the HMIS registry does not include details about trauma such as the cause of trauma, condition of the patient and subsequent treatment provided to the patient. It was therefore important to develop a more comprehensive trauma registry as a primary data collection tool for analyzing the root causes associated with incoming trauma patients. A complimentary initiative is being conducted by the World Bank's Development Impact Evaluation (DIME) team, whereby a large-scale pilot trauma registry is being implemented alongside the EMS Systems Management pilot in Malawi. The expectation is that both pilots can demonstrate that high-quality, real-time data systems are both feasible to implement and can aid in the collection of useful diagnostic data to inform the EMS policy dialogue and systems development for the sector[90].

In February 2018, MOH and DIME set out to establish protocols for using an agreed Trauma Registry at 10 of the largest district and central hospital facilities along the M1 EMS Pilot Corridor (with the hospital care units along the M1 between Lilongwe and

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[90] Croke et al. "Implementation of a multicenter digital trauma registry: Experience in district and central hospitals in Malawi" , International Journal of Health Planning and Management, July 2020

Mzuzu as the study's control sample). Data is being collected on all trauma cases that present at the hospitals, not just road crash victims delivered by the pilot EMS ambulance services.

Trained clerks and clinicians at each facility record data using a Computer Assisted Personal Interview software, referred to as SurveyCTO. The information collected includes:

- Demographic details - patient age, sex, education, occupation, residence location
- Injury information - cause of trauma, type of injury sustained, injury location, number of serious injuries, injury severity scores such as Glasgow Coma Score (GCS), "alert, verbal, pain, unresponsive" (AVPU), Kampala Trauma Score (KTS) and vital signs
- Hospital care information during and before the trauma - time patient suffered from trauma, time the patient arrived at the hospital, time when patient was treated by health care professional, treatment given to the patient, whether patient was referred or no).

Initial data collection at these 10 sites began in June 2018 and was subsequently scaled up and rolled out beginning in September 2018. Through July 2020, over 90,000 cases have been recorded, with data points indicating that 36 percent of serious trauma cases are due to RTAs and that non-motorized vehicle road users (pedestrians and cyclists) make up most road traffic crash victims in Malawi.

Both pilots are designed as a data-driven analytical approach to efficiency and efficacy of responding to trauma and specifically road crash incidents. Performance metrics for the EMS Systems include both operational and financial management data, including:

- **Twilio Flex call data.** Statistics on calls to the EMS call center. This data can, for example, be used to understand the volume of incoming and answered calls, trends in call load and average length of calls. Data from the Twilio Flex platform call also help assess the performance of the dispatchers that are working at the call center, in terms of number of answered calls and efficiency in handling them.

| Active Dispatchers | Number of agents who took part in handling the conversations. Includes agents that had at least one conversation with a customer. |
|---|---|
| Active Dispatcher Hours | Number of hours dispatchers were logged in and marked as "Active" - i.e., available to receive calls |
| Total Conversations | Conversation to which this segment belongs. A conversation is a set of segments related to handling one customer. (Rounded) |
| Abandoned Conversations | Abandoned conversations are those conversations where customers and agents have not communicated together. Customers gave up waiting for agents or agents stopped trying to reach a customer. (Rounded) |
| Handled Conversations | Number of handled conversations by your agents. |

| | |
|---|---|
| Total Handling Time (hours:minutes) | Time customer spent talking with an agent. This includes all silences and can be thought of as the time between picking the phone and hanging up. (Shown in hours:minutes) |
| PSTN Connectivity (hours:minutes) | The amount of time spent connecting the carrier network to Twilio Flex number |
| Abandoned Rate | Number of conversations in which customers and agents have not been connected and communicated with each other. (Percentage of the total conversations. |
| Median Abandon Time (minutes:seconds) | The time after which the call was abandoned without the parties connecting to each other. |
| Avg. Talk Time (minutes:seconds) | Time customer spent talking with an agent. This includes all silences and can be thought of as the time between picking up the phone until hanging up. |
| Avg. Ring Time (minutes:seconds) | Time in seconds the customer or agents spend on ring tone before reaching the other party. |

- **Type of call data.** In order to further understand the call load all incoming calls are code according to reason for calling, being for example, a real emergency call, a prank call, a dropped call or a call to request for information about EMS. Some additional data is also collected on how the caller learnt about the EMS services and from what district

they are calling. This data can assist call center operations in deciding how to staff the call center. Further the data can also inform the communication campaign aiming at increasing awareness about the EMS services in the general public, about the availability of the services, the toll-free emergency number and appropriate use of the same.

- **Beacon Dispatch incident management data.** The Beacon Emergency Dispatch software includes three levels of data on the communications between the call center and the EMS responders, community first responders and ambulances

  - Incident Reports – Data regarding the response itself (e.g., date, time, location, nature of incident et al.) as well as the efficiency and effectiveness of the responders assigned to the incident. Response Intervals are available from call intake to patient's arrival at the hospital, including:

    - Assignment Interval -- Length of time needed to assign at least 1 responder to the incident
    - Arrival Interval - Length of time before the first assigned responder confirms arrival on scene
    - Total Scene Interval – Length of time responder were at the incident scene
    - Transport Interval – Length of time needed to transport patients from the incident scene to a destination facility
    - Total Incident Interval - Length of entire incident, from alert to completion
    - Data Compliance – Rate at which responders reply to messages correctly

  - Summary Reports – An aggregate summary of Incident Reports over a

period of time

- Responder Performance Reports – Data regarding the participation of individual responders

- **Ambulances GPS data.** Data is showing the distance travelled by each ambulance connected to the EMS system, can validate response times, and allow for monitoring of patient movements in real-time.
- **Trauma Registry data.** Systematic collection of trauma data on trauma causes, treatment provided, timing of accident and care, and patient outcomes is crucial information that can meaningfully contribute to a well-functioning trauma care system in any country. The valuable datasets from the trauma registry, currently with over 90,000 cases, will also be used for an impact evaluation aimed at assessing the degree to which pre-hospital emergency care can contribute to improving on the health outcomes of trauma patients.

- **Monthly Operational reports.** These reports combine the data from the above sources to track key operational indicators such as incoming (real) emergency calls, number of dispatched ambulances, number of intrahospital transfers and the attended types of trauma (i.e. RTA, medical or obstetric.

- **Staffing and overheads.** Internet for the call center, voice and data packages for ambulance drivers and first responders, fuel and vehicle maintenance, all to gauge to the total average monthly running costs to determine affordability and fiscal requirements should the pilot or coverage areas be expanded for 118.

The expectation is that the data will enable policy makers to calculate the cost effectiveness of an EMS system, and the evidence can contribute to the decision of national expansion, or, alternatively, if other strategies might be more effective to reduce the burden of road traffic injuries. The goal of the process evaluation of the implementation of the EMS pilot is to document the learning from the process of the project implementation and highlight contextual factors that helped or challenged intervention effectiveness.

# II. Case Study 2

## Establishment of Sierra Leone's National EMS (nEMS) System

Sierra Leone offers a unique example in its approach to establishing a national EMS system in one of Africa's poorest countries. During the Ebola epidemic from July 2014 through March 2016, the Government of Sierra Leone had received several hundred ambulances to provide transport for suspected or actual Ebola patients and had established an emergency contact line (117) for health facilities or the general public to call "to facilitate prompt identification, investigation, isolation and testing of potential Ebola cases and deaths."[91] While there was initially a great deal of resistance to the service due to the fear that an ambulance trip would eventually result in death in

[91] Alpren C, Jalloh MF, Kaiser R, et al. The 117 call alert system in Sierra Leone: from rapid Ebola notification to routine death reporting. BMJ Glob Health 2017;2:e000392. doi:10.1136/ bmjgh-2017-000392

an Ebola treatment center or holding unit, it was gradually accepted by both the general public and the government as an important element of Sierra Leone's overall Ebola response. Even before the crisis was completely over (June 2015), the Minister of Health approached the World Bank to finance the development of a national ambulance service (key design parameters in Annex 3), including the necessary technical assistance for this process. Part of the rationale was to effectively utilize a sizeable ambulance fleet (approximately 200 or more at that time) that had been provided during the Ebola response.

Establishing a blueprint was the first step in the process. A series of design parameters were discussed with the respective government stakeholders that served as the basis for conceptualizing a National Emergency Medical Services (nEMS) system. The first and most important of these parameters was the proposed scope of operations. Options included: pre-hospital emergency care; urgent inter-facility transport; non-urgent inter-facility transport;

and aeromedical transport. It was decided that the system would initially focus on the first two priorities – pre-hospital emergency care and urgent inter-facility transport (with a focus on emergency obstetric care) – and then expand to include non-urgent inter-facility transport. Aeromedical transport was not considered to be affordable at this time. In practice, urgent inter-facility transport became the initial focus of the system, with pre-hospital care being included only in April 2020 during the COVID-19 crisis.

A second determination as to the scope of operations was to agree on the types of calls to be covered by nEMS, since this would determine both the focus of medical and staff training, as well as equipment requirements. Options included trauma (e.g., road traffic accidents); emergency obstetrics; other emergency referrals; and medical calls (stroke, heart attack, etc.). It was decided that all type sets should be included in the scope of services. A similar process was used for each design parameter and the result of these discussions is outlined in the Box below.

## Box 27 - nEMS Design Decisions

**Scope of service –** the primary focus of the EMS system will be pre-hospital emergency care and the inter-facility transport of urgent cases that may require medical attention en-route. Non-urgent inter-facility transport is also being considered, perhaps using scheduled services and/or vehicles (e.g., ambulatory patient vans), according to clearly defined conditions of use. The EMS system would cover all types of calls, including trauma, medical emergencies, emergency obstetrics and other emergency referrals, as well as inter-facility transfers.

**Size and location of teams –** the EMS system would provide full geographic coverage across the territory of Sierra Leone, sufficient to meet established response time (10 minutes urban and 30 minutes rural – tentative and subject to change through further analysis by consultant), population coverage and efficiency targets (to be established, although efficiency targets in urban catchments are expected

to be higher than in rural areas). The primary determinant for the number of teams should be based on population density in urban zones and by distance in less populated/rural areas. The pace for implementing EMS should be based on achieving national coverage from the start, with growing density of teams as time, resources and demand permit/require, rather than implementing on one region initially and then expanding to other regions over time. Current plans call for ambulances to be stationed at regional hospitals and National Fire Force stations.

**Organizational approach –** the EMS system is liberal and allows for both the public provision of emergency services as well as the private/non-Governmental provision of emergency services. It will be governed through a commission established by Parliament and managed by a small executive unit within the Ministry of Health and Sanitation. The commission will be responsible for overall direction of the EMS system, policy guidance, standards setting (including clinical and operational) and licensing of emergency services operators (public/private, fully private and NGO-managed), while the executive unit will focus on medical and operational oversight and contract management. In deploying any private operators, the services will be provided by one or more contractors using a public-private partnership (PPP) model, although a consortium with a primary contractor and sub-contractors (possibly including local service providers) is preferred. A centralized dispatch approach is preferred, although one or more back-up centers may be needed in case the central dispatch is not available.

**Composition, organization and training of teams –** the standard level of training will be equivalent to that of Basic Life Support (BLS) paramedics, with an expected 4- to 6-week training program using a standard curriculum. Teams will consist of three persons, including a driver and two paramedics. All teams should be available 24 hours per day, seven days per week, with a workweek of 40-48 hours per person (including holidays and sick time). The basic ambulance would be the B-type (European standard EN1789 type B, or US type II), although in more remote areas, motorcycle sidecar ambulances may be considered.

An important aspect of the initial design was an openness to the use of private operators under a PPP model. Various PPP approaches were explored, and it was ultimately decided to contract services for operations and management (O&M) while the government would maintain ownership of all resources and staff. It was also decided to use a single procurement process to recruit the management firm, whereby

the concessionaire would be responsible for finalizing the design and coordinate the initial system roll-out during implementation. Important aspects or requirements that were part of the concessionaires scope of service include:

• **Detailed design** – providing significant input into the design of a nEMS system, considering the design elements as determined by the

MOHS and in consultation with the World Bank as project financier. A tour of the interior of the country and visits to proposed building sites would inform the final designs, including detailed cost estimates of the nEMS.

- **Overall EMS system management** – Crucially, the development of an organizational framework for system management to run all operational components of the nEMS

- **Fleet management** – manage the fleet of vehicles (ambulances and others).

- **Operational management** – provide overall supervision services for the smooth functioning and running of the nEMS and all related facilities.

- **Knowledge transfer** – the firm was required to propose a mechanism to transfer knowledge on the management and operations of the EMS among the responsible cadre of government and ministry staff. The proposed mechanism, along with the detailed approach (i.e. training, coaching, mentoring etc.) was to be approved by the Ministry prior to implementation. Hiring of local "shadow" managers for the key management positions, who were trained and capable of taking over once the international consultants were finished their assignments offered the means for ensuring continuity in managing the service at the conclusion of the contract. As of August 2020, most international consultants had departed, and the service is now largely being run by these local staff.

- **Technology transfer** – any software developed during the contract period, including improvements to existing software and programs, needed to be handed over to the

Ministry of Health and Sanitation (MOHS). Software to manage patient flow from pick up points to the point of care were maintained and linked to the National Health Information System. All Operations and Procedures Manuals (log in sheets, fleet management tools etc.) were also handed over to the MOHS at the conclusion of the contract.

- **Training** – an initial training program was developed and delivered by MOHS to 619 Paramedics and 485 ambulance drivers, thus creating a pool of trained paramedics from which the firm could initially recruit. Further in-service training (in case the firm determined a need for additional skills among MOHS-trained paramedics and drivers), as well as a contribution to the additional refinement of the national paramedics training program, was also expected from service provider.

- **Performance targets** – Most importantly, a set of performance targets were designed to be met as a means to trigger incentive payments.

In October 2017, a joint venture consisting of the non-governmental organization "Doctors with Africa CUAMM" and the Veneto Region of Italy "Research Centre in Emergency and Disaster Medicine" was awarded an O&M contract. The detailed nEMS design and corresponding Standard Operating Procedures would take one year to properly develop. nEMS began operations in the Pujehun district on Sierra Leone's southern border with Liberia in October 2018. The coverage of districts was gradually expanded, so that national coverage was achieved in May 2019 with 80 ambulances, 439 paramedics and 433 drivers. As noted, the service initially focused on inter-facility transfers with the result that obstetrical cases predominated, followed by pediatric cases and other types of cases. Aside from the capital urban

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[92] Source: NEMS Operational Activities Monthly Report, May 2020.

area, the average distance covered by missions ranged from 55 to 104 kilometers, while average mission times were almost two hours. By May 2020[92], nEMS had managed 43,546 emergency calls, 41,619 missions, and 36,450 referrals, and had travelled over 3 million kilometers.

A total of 81 ambulances were deployed, or about 10 ambulances per million population.  It was originally intended not to employ the same 117 emergency number due to its association with its previous use during the Ebola crisis, and to use a common 112 emergency number with the police, but there were significant technical issues in linking the dispatch and communications systems that remain an unresolved challenge (as of May 2020).

During the COVID-19 pandemic one vehicle in each region were reserved for COVID-19 patients, with two allocated in the capital region. While the number of missions had averaged around 2,500 per month since national coverage was achieved, this surged to almost 3,500 in May 2020.  About 12 percent of the total missions were due to COVID-19, but otherwise obstetrical missions still dominated, followed by pediatric missions. Pre-hospital missions represented about 21.5 percent of the total missions (744), and 40

percent of those (302) were related to COVID-19. The original timeframe for the PPP arrangement called upon the concessionaire to finalize the system configuration and manage it for a set contract duration, with an expectation of handing back the management functions to the Ministry of Health as part of contract completion.  To this end, the contract called for the recruitment of local staff to fill key roles, provide "on the job training" from international experts, such that they would be able to continue to perform these roles once the contract was finished. The original contract was extended, and as of May 2020, no firm decision had been made on the future implementation arrangements.

Initial funding for nEMS was provided for two years on a declining scale through the Ebola emergency project financed by the World Bank, with the expectation that the Government of Sierra Leone would mobilize an increasing proportion of the resources needed.  As there was some delay in the ability of the government to mobilize necessary fiscal resources, additional funding was sourced through a separate World Bank-financed project for a limited period, until provision of adequate government budget is allocated for sustaining nEMS.

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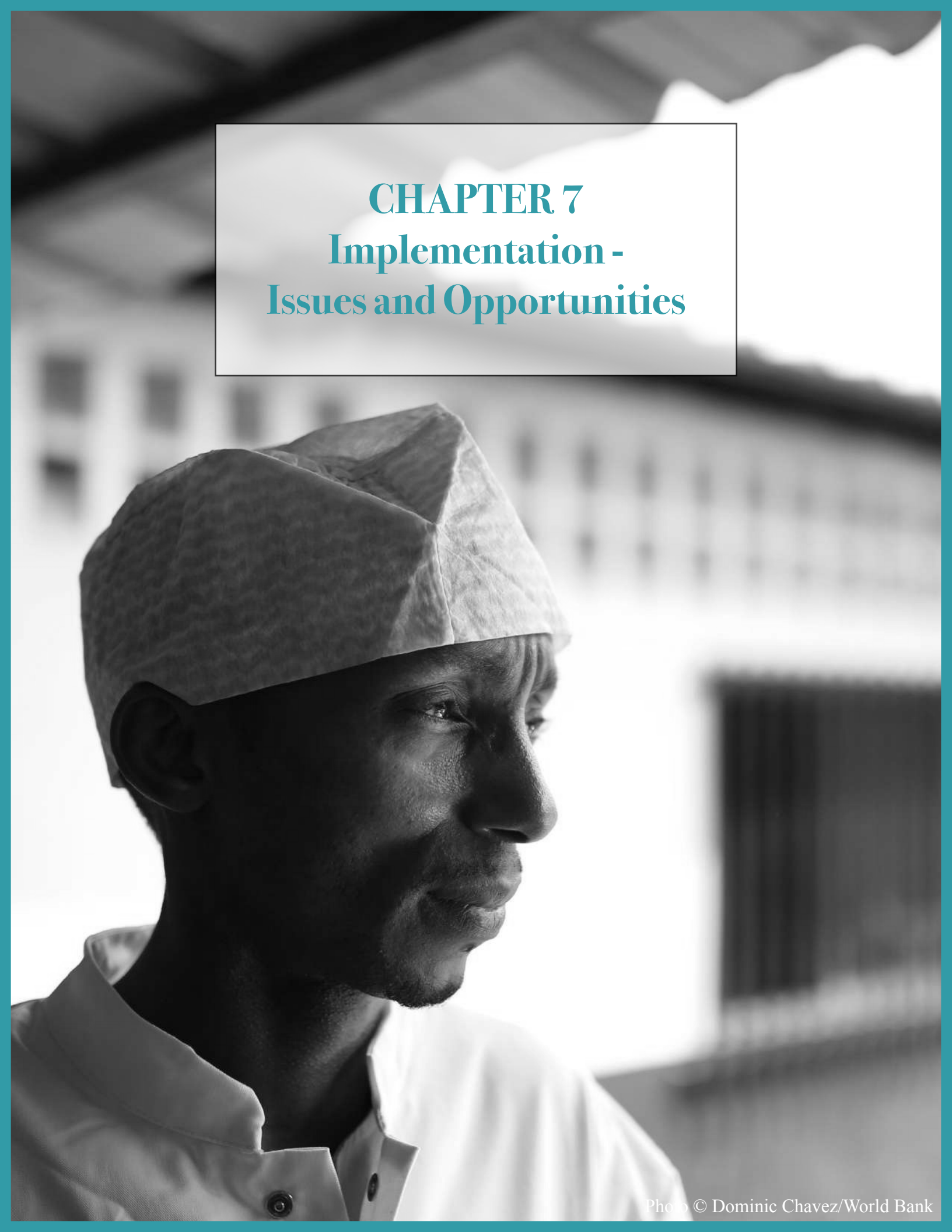
**Box 28 - Scaling-Up: India's National Rural Health Mission approach to ambulance services**

When the National Rural Health Mission (NRHM) was launched in 2005, India did not have a functional model of either an emergency response systems or assured transport for pregnant women in any state or region. Seven years later, there were about 4,500 publicly financed ambulances in 22 states covering about 450 million people and firm plans to scale up to another 6 states to bring total population coverage to over 710 million people or 60 percent of India's population.  The extensive use of public-private partnership (PPP) and various models of service delivery to meet specific state requirements, together with both financial and

policy support from the central government, all contributed to rapid this expansion.

Given the size of some of the states involved (several are over 100 million population, and 10 are over 60 million), it is clear that a well-planned implementation strategy, together with appropriate levels of financial support, should allow the establishment of scaled up national systems within a relatively short period of time (3-5 years).  However, further study of the strategies used to achieve the level of scale-up in India may be beneficial for other countries.

# CHAPTER 7
# Implementation -
# Issues and Opportunities

# CHAPTER 7: Implementation - Issues and Opportunities

## I. Summary

All available evidence confirms that well-functioning EMS systems clearly aid in reducing the morbidity associated with road traffic injuries, as well as with medical and obstetrical emergencies. In fact, it has been suggested that it is more expensive to do nothing than to make even the most basic improvements in prehospital system. This report takes a comprehensive overview of what broadly constitutes a functional EMS system with an aim to gauge the potential for expansion or improvement in post-crash response capabilities in Sub-Saharan Africa (SSA). Specifically, the chapter aims to provide guidance to sector development specialists seeking to support African states set a strong foundation for provision of EMS services by focusing on a set of strategically important determinants in the design, establishment, funding, and coordination necessary in EMS management, including broad recommendations on the opportunities for harmonization and collaboration.

Importantly, it's a misconception to view EMS as simply a matter of the size of ambulance fleets. Many of the hospitals, health centers and other clinic facilities across SSA have ambulances. Rather it relates more to the organizational structures, financing plans, skills mix and functional control of EMS operations. Stories abound of idle vehicles due to a lack of qualified drivers, insufficient fuel, or maintenance and repair problems that leave patients without access to services. Effective organization and management of the EMS system across a geographic area must ensure that even when drivers and paramedics have been trained and employed, they are available to respond to calls immediately and not performing other duties that would impact their ability to respond to emergency calls. While each part of an EMS system's individual components is crucial, how they are organized and governed can ultimately determine the level of quality and commitment to providing timely and effective patient care.

Based on the information collected in surveys completed by National Respondents, there remains a significant need for developing more robust and effective EMS systems, whether through enhanced regulatory standards and monitoring frameworks, by increasing skills and expertise aligned with service expectations or through telecommunication, data and information exchanges. Notably, while all countries appear to touch upon the core elements of EMS systems in some form, there is no clear demonstration of a highly or fully functional EMS system that exhibits all core traits – institutional, technical, fiduciary and human capital – that is essential to EMS delivery and management. Overall, the survey findings reveal that very few countries have developed a systematic and financially sustainable approach to delivering EMS services at scale, defined by proper governance arrangements, staffed by knowledgeable personnel and coordinated through clear data management and communications channels that are crucial for an efficient and effective EMS system.

Primary observations have been grouped around the four main themes of the survey, followed by general recommendations that can be considered for deeper analysis within the countries' respective contexts.

# I.1 EMS Governance and Standards

◊   There are wide variations in the state of EMS systems from country to country, especially as pertains to formalizing establishment and funding modalities, availability and expectations of educational and training programs, and development of necessary EMS communication protocols. EMS systems across SSA countries are widely diverse as to their basic models (Anglo-American versus Franco-German model), institutional mandates, organizational roles and functional dynamics. Consequently, this diversity implies that harmonization of standards and regulatory approaches should be distinct, both in the overall EMS governance framework and the provision of requisite tools and instruments for meeting EMS objectives and measuring care outcomes.

**There is a clear need for institutional reforms that focus on elevating national regulatory requirements – in accordance with international standards – as fundamental to the efficiency, effectiveness and sustainability of EMS systems.** The absence of legislation and legal provisions in many SSA countries can confuse institutional mandates or hamper coordination among various agencies, leave service quality and sanitation standards undefined, and limit or hinder the functionality of dispatch systems and communication protocols. The following opportunities are foreseen as areas for potential harmonization of EMS Organizational Standards:

1. Establish the institutional, communications and response protocols between the EMS system and all relevant public safety services and first responders (Police, Fire Service, Civil Protection Authority, etc.) through an appropriate legal framework.

2. Define the appropriate legal status of emergency medical services (pre-hospital) as part of the provision of healthcare, including the institutional mandates and operational requirements for EMS, together with the management procedures, financing arrangements and oversight responsibilities.

3. Institutionalize and integrate the first responder care within EMS system.

4. Codify regulations on EMS provider authorization for:
   • EMS provider authorization classifications
   • Application for EMS provider authorization
   • Issuance of an EMS provider authorization
   • EMS provider authorization renewal
   • Denial of an EMS provider authorization
   • Modification of an EMS provider authorization
   • Termination of EMS provider authorization
   • EMS provider inspection

5. Establish emergency medicine package of services to be delivered by type of provider

(first responder, EMS vehicles).

6. Establish the EMS patient pathway and referrals to manage transitions of the patient across settings of care.

In most cases, the harmonization of standards and regulatory approaches should be realized through a legally binding requirement, such as a law, decree or regulation that is mandated and enforced, if necessary, with the use of legal sanctions. The regulatory authority is then responsible for formally referencing a general set of requirements (rules, guidelines, minimal standards, technical regulations, criteria, etc.) that are legally binding decisions, permissions, or other formal authorization adapted to country's specific health care needs (distinctly for hospital-based Anglo-American model or physician-based Franco-German model), to social, geographic, political and EMS infrastructure.

**Well-functioning EMS systems provide a critical component to effective emergency preparedness and response capability within a broader disaster risk reduction strategy.** Countries should look to put in place legal provision for interagency coordination and communication in emergency situations. Further development in EMS interagency communications and EMS dispatch are essential to improving response capabilities necessary for pre-hospital care outcomes. This appears to be occurring in very few SSA countries and for isolated components. The full integration of the communications, dispatch and information systems is crucial to incident management, reporting and performance monitoring. A type of expansion and role-modeling registered in certain SSA countries (e.g. Senegal, Cameroon, Rwanda, Uganda, etc.) may be used to improve harmonization of EMS communications systems at country level.

◊ All SSA countries report national policies relating to universal service and the content of universal service adopted as part of action plans within CEMAC, ECOWAS, SADC and UEMOA initiatives. These regional organizations have prompted agreements by Member States to make available to their respective population, regardless of their geographic location, EMS call services that are offered toll free or at minimal price, while ensuring service continuity. They all include access to emergency services. The differences between SSA countries in terms of universal access concerns the implementation of such service, as national regulators are obliged to comply with their respective civil codes.

**The universal access/service fund offers the premier mechanism to promote universal access/ service development at a national level across SSA countries in a manner that indemnifies the universal access/service providers.**

1. All telephone terminal equipment should have the ability to enable a user to make an emergency call once the device has access to a public telecom network (of a compatible design). It should be possible to easily place an emergency call without any limitation, from any type or model of telephone that has access through any available public network (public telephones, dedicated call post with voice application, private coin and card payphones).

2. Network operators must make every reasonable effort to ensure the answering, inter-network forwarding and termination of emergency calls. All networks should transmit their network identification to the emergency control center in a standardized way. Each originating network should be able to recognize emergency calls by means of the emergency call number in addition to the local national emergency numbers valid in the originating network.

3. To further support emergency service operations each emergency call should be accompanied with information related to caller identity, location and mobile terminal equipment. Any network to which a PSAP is directly connected should deliver the emergency call to the PSAP together with any related data, without undue delay or modification. This information may either arrive at the PSAP at the same time as the emergency call or be available for retrieval on demand from the PSAP during the call. The generation and transmission of the information should not significantly delay the answering of the emergency call. Transit networks over which an emergency call is routed to a PSAP should forward this information in a transparent mode. If the appropriate PSAP is not reachable, the call should be forwarded to the alternative PSAP.

◊ There are no SSA countries in the responding group that could serve as a benchmark for harmonization of standards and legislative approaches of EMS system. As might reasonably have been expected, the EMS governance provisions surrounding both human and financial resources revealed material differences in the substance of EMS standards and requirements between SSA countries.

**Concentrated efforts in formalizing or improving EMS systems as a crucial component of the overall health system strengthening process is vital to post-crash response outcomes.** It is strongly recommended that any discussions regarding the harmonization of standards and regulatory approaches should keep a health system strengthening perspective as a guiding principle through synchronization of EMS provision, governance, financing and human resources requirements. Organizing the EMS system as a formal service within the

health system, including all core administrative elements (leading authority, organizational structure/chart, tiers of EMS system, agencies and providers responsibilities, jurisdiction and catchment areas for public and private EMS providers, etc.), will ultimately set the foundation for continuity in the provision of health services.

Through their respective Ministry of Health, EMS leading agency and/or authority with responsibilities on authorization in the EMS field, SSA countries should look to amend and repeal, as appropriate, requirements for the provision of emergency medical services, as follows:

1. Rules and Procedures on EMS provider authorization
   • Provision of EMS within jurisdiction
   • EMS provider availability
   • EMS provider place of operations (station)
   • EMS provider equipment (including vehicles) and supplies
   • EMS provider storage and security of drugs and related supplies
   • EMS provider personnel records
   • EMS vehicle records
   • Patient care records
   • EMS provider staffing

2. Minimal Standards on EMS vehicle
   • EMS vehicle classification
   • EMS vehicle safety
   • EMS vehicle occupant safety
   • EMS vehicle sanitation
   • EMS vehicle inspection
   • EMS vehicle warning lights and devices
   • EMS vehicle communications
   • EMS vehicle markings
   • EMS vehicle letter restrictions and specifications
   • EMS vehicle specification by class/ category
   • EMS vehicle staffing

3. Rules and procedures on EMS dispatch
   - EMS dispatch facility
   - EMS dispatch equipment
   - EMS dispatch staffing
   - EMD operational procedures
   - EMD response determinant
   - Selection and dispatch of the response
   - Post-dispatch response and pre-arrival instructions
   - Specific resource response
   - Cancellation requests
   - Multi-casualty incident dispatch

4. Quality Standards of emergency medical services

5. Clinical guidelines and protocols on EMS delivery

6. EMS vehicles requirements (by class/category) per population

7. EMS personnel standards (including PSAP and ECC) per population.

Once the system has gained experience and maturation in prehospital response, care, and transportation for patients, the standards should be extended and fully transposed.

# I.2 EMS Financing Arrangements

◊ Although most SSA countries report free EMS for households and individuals, budgetary resources or cost recovery mechanisms for EMS are limited and, in many cases, no funding formulas are in place to ensure financial sustainability of the respective EMS system. Insurance schemes for EMS vary greatly across countries. Payment mechanisms for EMS providers are generally weak.

**Funding options need to be carefully evaluated to confirm an appropriate mix of financing sources that provide stable revenue streams for system management, both in terms of upfront capital costs as well as ongoing operational expenses.** This includes mobilizing enough domestic resources of various types towards EMS delivery and embedding EMS/PECS as a core component of the health system strengthening model. This is especially true when the initial capital outlays are provided through external or donor financing, whereby the approach is likely to acquire all necessary equipment and supplies within a short period of time. Direct funding by the government through the Ministry of Health or other departmental budgets is quite common in developed countries, as is funding/contracting through social health insurance funds. Where the services are municipally based, local revenue sources are also tapped. Even where the services are run by higher levels of government, some financial contribution from the lower levels may be required; conversely, services run by lower levels of government may receive subsidies from higher levels. This approach has been used in India to help support a rapid scale-up of EMS.

Other potential sources and the rationale for using them are shown below.

- Special levy on auto insurance premiums or automobile licensing fees. The rationale for this source is that since road traffic accidents are a major generator of the demand for emergency services, those using the road should help to

cover the cost. Even a small levy, which would not be noticed by the average motorist, could generate substantial amounts of revenue.

- Allocate part of fuel taxes. An example is the Namibia or Botswana Motor Vehicle Accident Funds: parastatal insurers funded by fuel taxes, which reimburse cost of pre-hospital care and health care costs for RTA's. They also pay outpatient disability benefits related to RTA's.

- Special levy on mobile or fixed-line phone subscriptions or top-ups. Such levies are used in the United States and Canada to help maintain the single calling number system (911).

- User fees. While many systems charge user fees, often to help deter frivolous use of PECS, such fees may represent a significant barrier to accessing the service in the case of real emergencies, so they should be used cautiously, especially in LMICs.

- Subscriptions. Privately run services may operate on a subscription basis.

- Donations and grants.

- Tourism and industry.

**In developing a financing strategy, careful**

**attention needs to be given to downstream financing needs for fleet management as a core tenant of the EMS system.** When such assets are not properly cared for or scheduled to be replaced, operating costs are likely to increase due to the need for extensive maintenance, or service levels are likely to decline as vehicles and equipment become unusable, either intermittently due to maintenance requirements, or permanently, or perform below acceptable standards. Hence, a crucial element for ensuring EMS program sustainability is effective life cycle and asset replacement planning. This can include fleet management strategies that opt for a rotation of vehicles and equipment from those areas that have a high call volume, or a high average-distance-travelled per call, to those coverage areas where the "wear and tear" is less, as a means to extending or preserving asset conditions. For example, in Sierra Leone, the variation in the number of kilometers travelled each month is typically a ratio of between 3:1 and 5:1 when comparing the district with the highest number of kilometers to the one with the lowest. An effective fleet management program can help to maximize vehicle life so that those that are used in the high-kilometer districts don't prematurely fall into a state of disrepair. A robust and well-funded replacement program for vehicles and other resources is essential to ensure the continuous smooth functioning of EMS.

# I.3 EMS Training

◊ EMS terminology varies across the sub-region, lack standardized definitions, leading to nomenclature that is used interchangeably.

Recognized international and regional institutes for medical standards development include the International Federation for Emergency Medicine, the European Society for Emergency Medicine, the African Federation of Emergency Medicine,

the College of Medicine of South Africa, among others, which must be contextualized according to the EMS system model in place.

◊ Standardized accreditation of EMS training programs across SSA are non-existent. However, post-graduate EM training has improved with training programs in development and twinning partnerships on

the rise in the sub-region.

**Countries must consider how to elevate one entity or authority responsible for regulating the EMS education system.** With few exceptions, no standardized accreditation of training programs or education institutions for Emergency Medicine or accreditation of qualifications attained in individual SSA countries is present across SSA countries. Individual recognition of training and qualifications is decided at the national level according to each national authority's rules. Based on the findings of the surveys, harmonization of EMS training aspects may be best tackled at the sub-regional level (e.g., anglophone versus francophone countries), recognizing the different EMS models and approaches within these countries respective health systems. Crisis and disaster management should invariably be part of any EMS training curriculum.

The specific context on human resources for health services in SSA countries emphasize the need for a more wholistic approach towards harmonization in EMS training across SSA countries. Harmonizing a training program for the specialty of Emergency Medicine is more difficult than for other health specialties. EMS certification requirements vary greatly across the sub-region where some countries require EMS physicians to have a specialty in one or more medical area. This is due to the role and the responsibilities of the emergency physician and other EM professionals, and the structure of emergency care being highly variable across SSA countries. The situation is more heterogeneous in the case of other EM professionals (such as EMTs) in the majority of SSA countries. The national training programs are likely to reflect these differences.

To succeed with harmonization interventions, there is a need for ensuring that national authorities acknowledge the core competencies in EMS delivery when

approving EM training programs, namely:

1. Establish, at the appropriate legal level, that competencies in the field of authorization/accreditation are fully defined and attributed to a national level authority (i.e. national training authority, national qualifications authority, health professionals' board, etc.).

2. Establish, at the appropriate legal level, the specialization of emergency medicine, including recognition of EM professionals as per entire EMS provision chain.

Further, there are several mandatory components of EM training programs that need to be addressed in any harmonization processes. This should be extended to all EM specializations, including:

- Admission requirements specific to the EM training program

- Length of the EM training program (minimum requirement of training to be recognized)

- Content of training and learning outcome

- Assessment of trainee performance (formative and summative examinations)

- Award of Credits

- Trainers' required qualifications and experience

- Training institutions requirements regarding staff and clinical activities

- Training institutions requirements regarding equipment, accommodation and facilities

- Evaluation and review (evaluation of training centers, training programs, trainers)

Thus, the process must cover:

1.  Harmonization of national standards with relevant international and regional standards and practices.

2.  Promotion of mutual recognition of professional competences and qualifications (i.e. training programs, diplomas, etc.) among SSA countries.

3.  Cooperation among national accreditation authorities to facilitate the implementation of mutual recognition arrangements of professional qualifications to facilitate and improve the movement of all EMS professionals throughout the region.

4.  Reflection of scientific and medical progress in Emergency Medicine.

# I.4 EMS Communication Standards

◊  EMS Communications has improved in SSA with all countries reporting National Numbering Plans, an authority responsible for regulation and coordination of the numbering resource of the country, emergency services numbering alignment with the International Telecommunication Union Recommendation E.161.1 and the numbers are free of charge.

**The most salient recommendation related to public access is the allocation of a single emergency number to call in the event of a medical emergency.** For those countries that operate multiple emergency numbers, the opportunity of shifting to a single emergency call number must be critically assessed, including an examination of the implementation timeframe, technology implications/readiness, market (population) readiness, public safety services availability and awareness, regulatory implications and financial human resources requirements, among other considerations. An EMS system that has adopted the single emergency number or specific number for medical emergency provides the public the basic means to more readily access prehospital emergency care system.

In situations where multiple emergency numbers are utilized, such that PSAPs work independently from each other, their association must not be subject to special needs. In cases where calls may arrive at PSAP that are not within their respective jurisdiction (e.g. coverage area or emergency categorization), there may be a need for call transfer, together with additional location or event information. SSA countries are encouraged to establish regulations on interagency coordination, whereby: (i) the incoming call is first handled by the receiving PSAP; and (ii) the call is immediately transferred to the responsible PSAP for incident response/service or the receiving PSAP may transfer the call directly to the relevant ECC, which are transferred together with requisite location details and other pertinent data for incident management. Senegal again represents a good practice example of regulatory approaches to such coordination, – i.e. laws that stipulate the Fire Service obligation to transfer a medical emergency call to EMS system.

◊  Though organization of PSAPs and ECCs tend to be structured based on the uniqueness of each country context, call

center and dispatch systems for EMS services remain in a nascent stage in SSA.

**The utilization of dispatch or data management systems is SSA needs to be considered as an essential element of the development of any EMS/PECS system.** First and foremost, this includes a well-developed priority dispatch management system that allows the processing and monitoring of all calls and collects information on their progress and disposition[93]. Systems to receive a call requesting assistance for an emergency victim represents an initial step but must be followed by a coordinated response effort to be truly effective. The ability to dispatch a wide range of emergency resources and personnel is also recommended, given the wide availability of mobile phone technologies and the comparative lack of emergency response vehicles.

System design processes must focus on two distinct phases in EMS communications implementation: (i) overall EMS system planning and identification of local resources and needs and describing how these needs can be met; and (ii) the detailed information and telecommunication (ICT) architecture and network configurations supported by technical expertise alongside of EMS provision. The harmonization process must include (a) alignment with international standards (technical requirements at regulatory level), (b) know-how at the county level (implementation knowledge), and (c) effective coverage of all key components of the EMS system – public access, dispatch and interagency communication. A certain degree of flexibility must be allowed in local implementation of minimum standards. Finally, there is a need for operational and administrative arrangements (finance, human resources, fleet management,

asset management, etc.) that – together with the first two parts of the system – can facilitate operational control and performance monitoring.

With advances in EMS communications mainly driven by the telecommunication industry, implementing an EMS communications system must necessarily consider both the current status of a country's EMS provision, as well as existing telecommunications infrastructure and regulations. This includes accepted standards for functional performance, as well as local market readiness, geographic and socioeconomic conditions.

The analysis highlights the following main considerations in regulating communication protocols between ECCs and the ambulance teams:

1. Specialized functionality in group communications and dispatching, with instant connection to radio frequency and including appropriate channel security, dynamic management of talk groups, prioritization of communications.

2. Performance metrics on call establishment times, with typical requirements for voice call set-up time in the range 0.3 seconds to 1 second.

3. Seamless radio or network coverage across the area affected by the incident itself and the areas of operational activities associated to the incident (EMS provider, hospitals, etc.), including necessary redundancies to maintain communication during network outage.

4. Access to the network controlled by using functions such as assigning priority to potential users, thereby limiting access to the network

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[93] Call center dispatch systems should be capable of recording incident details, location verification, unit and incident display, incident dispatch, integration with mobile data terminals and unit recommendation, time stamping and mapping, and systematic categorization and prioritization of calls according to the clinical urgency of patient's condition.

for some under certain circumstances.

International good practice would entail that the relevant Communication Regulatory Authority and MoH/Leading agency for EMS in SSA countries strengthen the regulatory environments and technical specifications in the following areas:

• Communications equipment in PSAPs/ECCs

• Communications equipment in EMS vehicle

• Communications equipment in inpatient facility

• Frequencies and tones for EMS communications (primary method)

• Non-radio public safety communications channels (secondary method)

The telecommunications regulations related to license requirements for telecom operators (e.g., the need for operators to provide free access to emergency short codes), radio communications and so on, are major factors influencing what can be done in this space; thus a useful parallel discussion may involve the potential of harmonizing telecommunications services more generally. Ministries and agencies responsible for designing EMS system architecture must be prepared to modify the governance frameworks and regulatory specifications as the EMS system matures. These areas must rely mainly on the organizational structure of the EMS system they are supporting, including designed jurisdictions and/or catchment areas.

◊ Some countries have looked to pilot specialized Trauma Registries that provide longitudinal data on trauma patients in order to develop a better understanding different types of trauma patients and what can be done to improve overall outcomes.

**A critical impediment to EMS development across the region is a lack of emphasis on data driven decision making that is informed by robust information eco-systems.** Appropriate patient call records (preferably electronic) that collects and records patient level clinical, demographic and temporal data from the time a call is received until the patient is delivered to the emergency department is also crucial. Ideally, this should link to a hospital-based electronic health record to allow the development of a complete longitudinal record for each patient[94]. In addition to basic demographic information, such registries also include information on the mode of arrival (ambulance, private vehicle, etc.), the mechanism of injury, the state of the patient upon arrival, vital signs at various times during a patient's stay in the facility, treatments provided, and eventual outcomes. In more established trauma registries, this includes follow-up at 30 days beyond hospital discharge to determine longer-term outcomes. Once such data ecosystems are developed, and appropriate patient privacy and confidentiality measures are in place, they can also contribute to improved research on the impact of PECS/EMS on the health and well-being of the population, including providing region-specific evidence, including outcomes on post-crash response.

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[94] Specialized Trauma Registries (TR) can provide longitudinal data on trauma patients (especially where electronic systems are not fully developed) in order to develop a better understanding different types of trauma patients and what can be done to improve overall outcomes. In addition to basic demographic information, such registries also include information on the mode of arrival (ambulance, private vehicle, etc.), the mechanism of injury, the state of the patient upon arrival, vital signs at various times during a patient's stay in the facility, treatments provided, and eventual outcomes. In more established trauma registries, this includes follow-up at 30 days beyond hospital discharge to determine longer-term outcomes.

## I.5 Conclusion

Across SAA, continual enhancement and improvements in emergency care have been observed over recent years. Though several elements of EMS system development remain paramount, few countries have been able to develop a fully functional and comprehensive EMS system. Multiple barriers to enhancing and expanding EMS in SSA still exist both at the regional and country levels. Three of the major barriers are (i) lack of prioritization of EMS (and PECS more generally) by key decision makers, especially in the ministries of health and finance, (ii) inadequate funding sources, and (iii) a lack of standardization and coordination for EMS services across stakeholders. This becomes even more pressing during and post-COVID-19 pandemic, both due to the lack of resources in many countries to improve prehospital care, and the increasing need to transport seriously ill COVID-19 patients to higher levels of care.

# II. Prospects for Aligning and Harmonizing EMS Enabling Environment

Importantly, the report aims to evaluate the degree to which harmonization can offer potential benefits beyond individual countries or groups of countries. The existence of regional harmonized standards and regulatory frameworks can promote integration of health service systems more broadly, as well as specifically in the area of EMS, through the easier movement of qualified staff (labor mobility), standardized communications approaches (for improved coordination in the case of natural disasters or cross-border mass casualty emergency response incidents), increased private sector participation, including public-private partnership (PPP) or potential cost savings opportunities by strengthening purchasing power through coordinating acquisition of ambulances, equipment and supply stocks.

At the regional level, there are opportunities to harmonize activities and policies between SSA countries. Greater emphasis placed on the establishment or convening of pan-African (e.g., AU, Africa CDC) or sub-regional forums (e.g., ECOWAS, SADC, EAC) would encourage States to explore and identify possible synergies for strengthening EMS systems. For instance, a dedicated regional or sub-regional forum could lead on defining institutional mandates, EMS terminology and standardizations that support common ecosystems for rationalizing EMS service expectations that embed practices to integrate EMS as part of universal health coverage across the sub-region. Regional institutions could lead on shaping or harmonizing approaches to medical or auto industry insurance policies that enable or facilitate cost recovery of EMS service provision. EMS education, training and certification programs can be uniformly designed at a regional level or across SSA, while also organizing twinning programs and other partnerships that can be optimized.

At a country level, governments should elevate the priority of EMS systems within Ministries of Health (as well as coordination between other ministerial stakeholders more generally) to facilitate more effective prehospital care. In many instances, this includes mobilizing enough domestic resources of various types towards EMS delivery and embedding EMS/PECS as a core component of the health system strengthening model. Legal provisions and regulatory frameworks that adopt regional and international guidelines should be introduced or revised to align service and quality standards. Countries must also acknowledge the importance of access to prehospital emergency care in underserved and remote communities. Increased and targeted funding or financing modalities toward training, knowledge and management of EMS personnel is also crucial to effective and reliable information systems.

Researchers, professional associations and regional entities (e.g., African Federation of Emergency Medicine, Africa Regional Road Safety Observatory) should continue to deepen their discussions, research, and knowledge exchanges on the relative impacts that functional PECS/EMS systems can achieve in reducing road trauma fatalities. A continental or regional research agenda should be developed as a top priority to ensure data is collected and analyzed to inform future directions. More emphasis on developing a larger cadre of EMS practitioners, and researchers through partially and fully financed fellowship programs. Centers of excellence should be established to facilitate research on technical and managerial aspects of PECS/EMS services.

SSA countries are experiencing a double burden of disease; increasing mortality rates from non-communicable diseases – with road trauma fatalities sadly a leading indicator – coupled with the prevalence of communicable diseases in Africa. While road accident and fatalities rates across the regional may be attributable to a combination of poor vehicle standards, road infrastructure, and safety behaviors, the absence or shortage of post-crash response (whether in the form of trained emergency personnel, available ambulatory services, or emergency call centers) will ultimately compromise a patient's recovery, potentially incur preventable physical disabilities and may well witness a continued rise in mortality rates from road trauma. Hard-won gains in human capital development can be quickly lost. Together with development partners, countries should look towards investments that prioritize EMS/PECS as an essential element of health system strengthening and access to universal healthcare.

# ANNEXES

# Annex 1: EMS Questionnaire (English version)

**QUESTIONNAIRE**

**EMERGENCY MEDICAL SERVICES (EMS) STANDARDS, FINANCING OPTIONS, TRAINING AND COMMUNICATIONS**

**Introduction**

The Global Road Safety Facility (GRSF) has provided funding to the World Bank through the Southern Africa Trade Transport Facilitation Program to contribute to the development of scalability and sustainability plans (including financing and economic justification) and enhance the capacity of Tanzania and Malawi for adopting and expanding the EMS and post-trauma care pilots; and to explore options for the broader introduction of post-crash response services across SSA, including the identification of opportunities for regional collaboration.

The Questionnaire can be answered by a staff member with a good knowledge of EMS in the Ministry of Health and/or another public central authority (i.e. Ministry of Transport, National Agency of Telecommunications Regulations, Ministry of Education, etc.).

If EMS in your country is also operated by the private sector we would appreciate a staff member from this organization also completing and returning the Questionnaire to us.

Thank you in advance, we are appreciative of the time you have taken to complete this Questionnaire on how emergency medical services are organized, function and are financed in your country.

**Instructions for Completing the Questionnaire**

= All your individual responses will remain confidential to the World Bank Project Team and Project stakeholders to whom the findings from the Questionnaire will be presented, although they may be aggregated, summarized and analyzed to develop a more comprehensive picture of the state of EMS in SSA.

= Please respond to each question as requested and where you want to provide supportive information and/or documents can you ensure the additional information is in soft (electronic) format to be emailed back with your completed Questionnaire.

= Write or type your answers directly on the Questionnaire, below each question.

= Provide narrative answers, which shall be based exclusively on legislation in force. Please restrict the answer to legal provisions and their synthesis and avoid their interpretation/analysis.

= Some questions allow the selection of more than one option. Please make tick mark in check boxes for selection of options.

= Answer the questions only as they apply to the normative framework in force.

= In case any question is not applicable to your agency/organization, please specify "Not Applicable" or "NA" (to the inserted Comment) or transfer the questionnaire to another Respondent to answer the question.

= If you have any additional comments on any of the questions or on the questionnaire in general, please feel free to include them at the end of the questionnaire, or as a separate document.

**Respondent(s) Information**

Please enter your contact information:

| | |
|---|---|
| = First Name | |
| = Last Name | |
| = Title | |
| = Position | |
| = Agency / Organization | |
| = Address | |
| = E-mail | |
| = Phone Number | |
| = Fax Number | |

For any additional respondent, please enter contact information.

**PART I**
**EMERGENCY MEDICAL SERVICES STANDARDS**

**Section: EMS Governance**

A.1: Are there different definitions for terms (terminology and semantics) or is there a common definition for Out-of-Hospital Emergency Care (OHEC), Emergency Medical Services (EMS) and Emergency Departments (ED)? If NOT, please go to Question A.3

A.2: Please indicate how these terms are defined – by law or other normative acts/regulations, licensing and/or accreditation standards, clinical guidelines/protocols, pre-service or in-serve training curriculum, job description, etc. Please provide references to support the answer you have given.

A.3: Please indicate the model/approaches to organize and regulate pre-hospital emergency care system(s)
□   National system (designed, developed and controlled by a country's central governmental authority – e.g. Ministry of Health, Center for Pre-Hospital Emergency Care, etc.)
□   Local or regional systems (in line with other public agencies, district or municipal prehospital emergency care systems are administered by local or regional governments, and they may use existing infrastructure - e.g.  Police, fire or public health systems, or a separate non-profit infrastructure to deliver prehospital emergency care.)
□   Private systems (private EMS companies, operating either as non-profit or for-profit organizations contract with authorities to provide prehospital emergency services throughout a defined catchment area)
□   Hospital-based systems (a referral hospital personnel, resources and infrastructure ensures the emergency care system functioning)
□   Public Service integrated with Department of Exceptional Situations, Fire Service and/or Police (e.g. with or without legal personality)
□   Volunteer systems (organized around prehospital providers who donate their time and services to their community)
□   Hybrid systems (combination of different components of the models described above to provide prehospital care for a particular community according to political, financial and administrative considerations)
□   Other, please describe.

A.4: Which central public authority (e.g. Ministry, Government Agency or National Center, etc.) has the authority to design and implement EMS policies on an ongoing basis and shall be held accountable for EMS system? Please describe its responsibilities and duties.

A.5: Are there other EMS governing bodies at national and/or regional/local level? Please provide their duties in the field of EMS as established by the normative framework in force.

A.6: Is the EMS system integrated in health system and other appropriate sectors of the Government? If NOT, please go to Question A.11.

A.7: Please describe governance interventions on integrating EMS system with health system and other appropriate Government sectors (e.g. Transportation, Internal Affairs, public safety, etc.).

A.8: Is there a law stipulating the role of EMS system in the national plan in case of crisis/disasters? If YES, please provide a copy of the legislation.

A.9: Which authority holds the leadership in crisis/disaster management? Is any EMS system representative part of the national crisis management team?

A.10: Is EMS system legally required to have a crisis preparedness plan? If YES, please describe the areas covered by this Plan.

A.11: Does the pre-hospital emergency care system include the level of First Responder Care? If NOT, please go to Question A.15.

A.12: Does the First Responder Care level integrate the community response with existing structures – e.g. community healthcare worker, midwife programmes, taxi-driver or police officer trauma programmes, Emergency First Aid Responder (EFAR) System, etc.?

A.13: Do the medical personnel, regardless the specialization, have the legal responsibility to provide care in emergency cases within the limits of their competence?

A.14: Are the First Responder Care programmes/interventions primarily led by the community or by the Government?

A.15: Are there in force well-defined EMS jurisdictions and/or catchment areas? If NOT, please go to Question A.17

A.16: Please list the established EMS jurisdictions/catchment areas and designation criteria.

A.17: Does the Constitution and/or organic laws in the field of healthcare establish the right to receive emergency care for every citizen and/or person in the territory of the country?

A.18: Does the National Health Act (Law on Healthcare) and/or specific EMS law provide regulations on organization of EMS system, provision of emergency medical care and legal form of provision of emergency medical care? If YES, please describe in detail the regulations with appropriate references.

A.19: How are EMS providers required to be legally organized? By the current law who can set up an EMS provider?

A.20: Is there a legal requirement for licensing/accreditation by the designated authority to operate as an EMS provider, including Emergency Control Centers (dispatchers) and Public Safety Answering Points? If NOT, please go to Question A.22.

A.21: Please describe the process of EMS provider licensure/accreditation. Provide appropriate references. The following issues shall be mandatorily covered:
= EMS Licensure/Accreditation requirements. Considerations of application for license
= Application for EMS license/accreditation. EMS provider licensure/accreditation classification
= Processing of application
= Issuance of EMS license/accreditation
= Denial of EMS license/accreditation
= Renewal of EMS license/accreditation
= Suspension of EMS license/accreditation. Correction order
= Revocation of EMS license/accreditation, practices and procedures and severability
= Reinstatement of EMS license/accreditation and lifting of suspension
= Modification/amendment of EMS license/accreditation
= Termination of EMS license/accreditation
= Fees for EMS licensure/accreditation
= Specific requirements regarding the financial capacity – general liability, including limits per case and aggregate; automobile liability, including limits per case and aggregate; professional liability, per claim/case and aggregate.

A.22: Are there current operation standards and requirements for an EMS provider to comply with? If NOT, please go to Question A.24.

A.23: Please describe the operational standards and requirements an EMS provider shall comply with. Provide appropriate references. The following issues shall be mandatorily covered:
= Place of operations
= Availability twenty-four (24) hour basis, seven (7) days a week, year-round
= Equipment and supplies
= Storage and security of drugs and related supplies
= Preparation and maintenance of records and reports
= Personnel records
= EMS vehicle records
= Patient care records
= EMS agency/provider Status Report
= EMS agency/provider's availability of internal standard operation procedures (SOPs)
= Operational Medical Director requirement
= Quality management reporting
= Designated emergency response agency standards
= Designated emergency response agency mutual aid.

A.24: Please describe the standards and requirements an EMS vehicle shall meet. Provide appropriate references. Please address the following issues, if possible:
= Classification of EMS vehicles
= EMS vehicles equipment requirements
= EMS vehicle permit requirement
= EMS vehicle safety

= EMS vehicle occupant safety
= EMS vehicle sanitation
= EMS vehicle warning lights and devices
= EMS vehicle communications
= EMS vehicle markings
= EMS vehicle letter restrictions and specifications
= Non-transport response vehicle specifications.

A.25: Does EMS system include specialized emergency medical services vehicle (SEMSV) – e.g. neonatal ambulance, trauma ambulance, mobile intensive care unit, etc.? If YES, please provide a copy of the specifications for each type of vehicle.

A.26: Do the EMS standards state that an inspection to be regularly carried out to determine whether the EMS provider (i) complies with the minimum standards and (ii) is suitable and adequate for the purpose of providing for which it is applying or has applied?

If YES, please describe:
= Inspection for new applications - practices and procedures. Attach the appropriate regulations.
= Inspection of registered EMS providers - practices and procedures. Attach the appropriate regulations

**Section: EMS Financing Stewardship**

A.27: Which authority is responsible for the development of EMS financing policy? Please indicate the areas which are covered by these regulations:
□ Healthcare funds allocation
□ Coverage schemes
□ Exemption policies
□ Tariffs
□ Fees for non-covered
□ Contracting health services
□ Reimbursement
□ Stewardship and oversight of payer organization
□ Incentivize providers for efficiency and quality care
□ Provider control and audit.

A.28: Under current legislation which authority/organization is responsible for financing EMS in each of the following areas:
• service provision
• infrastructure (facilities)
• capital expenditures (equipment)

A.29. Are there legal provisions regarding the mechanisms for allocating funds for EMS? If NOT, please go to Question A.32.

> A.30: Does the legislation in force establish a target-budget/budget ceiling or a share from budget to be allocated for EMS? Is this amount linked to the revenue or to expenditure?
>
> A.31: Does the legislation in force set out a specific target expenditure target per EMS funding source? Do different sources of funding cover specific expenditures categories of the EMS provider (e.g. expenditures connected with care provision, etc.)?

A.32: Please describe the process of how the annual budget for EMS is allocated for EMS?

A.33: Are legal provisions in place to determine which the EMS system shall receive funds for crisis and disaster preparedness? If YES, please specify the budget ceiling and allocation procedures.

A.34: Is EMS included in the state guaranteed package? If NOT, please provide the categories which are covered or subsidized by the Government.

A.35: Are emergency medical services provided to households and individuals free of charge? If NOT, please describe what complementary or supplementary (out-of-pocket) payments are required for EMS.

A.36: Does the normative framework establish a purchaser-provider relationship in emergency medical services delivery? If NOT, please go to Question A.39. If YES, please answer the Questions A.37 – A.38 and then go to Question 40.

> A.37: Describe the purchaser(s) legal responsibilities and duties. Please refer to appropriate standards in the acts and or regulations.
>
> A.38: Are purchases for EMS subject to public procurement legislation? Are there any legal provisions regarding selection of EMS providers?

A.39: Describe the existing EMS procurement schemes and modalities. Please refer to appropriate standards in the acts and regulations.

A.40: Does the normative framework in force stipulate methodologies for establishing tariffs, insurance premiums, etc.? Are these tariffs common for both public and private EMS providers?

A.41: Are there any legal provisions regarding EMS provider oversight, control and penalties to account EMS providers poor performance and non-standard care. IF YES, please describe the practices and procedures.

**Section: Emergency Medical Services Delivery**

A.42: Are there national level operational policies and protocols applicable to all authorized EMS providers that support execution of EMS process? If NOT, does each EMS agency/provider have its own policies?

A.43: Which EMS vehicle dispatch policy is applied in the EMS system:
□ Closest ambulance to the scene
□ Ambulance with the longest idle time
□ Dynamic ambulance relocation
□ Other, please describe.

A.44: Which triage policy in transporting patients is applied in the EMS system (e.g. Resource-Based START, non-conveyance, etc.)?

A.45: Which is the current policy regarding which hospital a patient will be transported to for emergency care:
□ Normative judgments – designated hospital catchment area
□ Nearest emergency department with available beds
□ Complex method - candidate Emergency Departments' available capacities
□ Waiting times, and distances from the incident scene
□ No policy in place.

A.46: Are there national level operational policies and protocols applicable to all authorized EM Dispatcher providers that support execution of dispatch process? If NOT, does each EMS agency/ provider have its own policies?

A.47: Describe the applied procedures in multi-casualty or mass casualty incident dispatch and response. Please refer to the current Disaster Medical Dispatch Protocol.

A.48: Do out-of-hospital triage protocols follow national standards or does each EMS provider have its own triage protocols?

A.49: Do the triage assessment influence the pathway of the patient?

A.50: Are response times used as a measurement in a system quality assurance process? If YES, which are the response-time indicators for specific categories of emergencies - first responder and patient transport (EMS system targets and registered values according to official statistics and/or operational researches)?

A.51: How are patient records produced, registered and stored by the EMS providers?

A.52: Are there requirements to leave a formal copy of the EMS patient care report with the patient's receiving healthcare provider at the time of transfer?

A.53: Is there a national (or regional) system for quality assurance of EMS? If YES, please describe the practices and procedures. Refer to the appropriate regulations.

A. 54: Are there initiatives to measure and/or monitor patient satisfaction and/or patient experience? If YES, please describe practices and procedures.

**Sub-chapter: EMS System Human and Other Resources**

A.55: Please provide minimum staffing requirements per EMS vehicle class/category, including the type of personnel (driver, paramedic, nurse, etc.).

A.56: Please provide EMS personnel standards per population. Please refer also to public safety answering points (PSAP) and Emergency Control Center (ECC) personnel.

A.57: Are there approved methodologies/regulations at national and/or regional level regarding planning and forecasting EMS personnel needs? Please refer also to PSAP and ECC personnel.

A.58: Please provide EMS vehicles requirements (by class/category) per population

A.59: Are there approved methodologies/regulations at national and/or regional level regarding planning and forecasting EMS vehicle needs?

A.60: Do the current standards regulate the following issues? Please describe briefly the regulations content and provide references to standards in the acts and regulations.
= EMS personnel liability
= Misrepresentation of qualifications
= Extraordinary care outside of protocols
= Inability to carry out medical control orders
= Consent and informed consent. Consent in pre-hospital environment
= Provider disagreement over patient's needs
= Restraining patients outside of hospital
= Do Not Resuscitate (DNR) orders in the pre-hospital environment
= Patient abandonment
= Declaration of Death (DOD). Requirements of a DOD document.

## PART II
## EMS FINANCING

B.1: How EMS is funded:
- □  A. MoH budget
- □  B. Separate government budget from MOH
- □  C. Private sector sources only
- □  D. User pays
- □  E. Combination A, B, C, D.

B.2: Please provide estimations of donor funding for each budget source mentioned at Question B.1.

| Source | Amount (currency: _____) |
|---|---|
| A. MoH budget | |
| B. Separate government budget from MOH | |
| C. Private sector sources only | |
| D. User pays | |

B.3: What is the estimated cost of EMS in your country? Please denote the currency used.

B.4: How sustainable is funding for EMS.
- □  A. Committed funding up to 3 years
- □  B. Annual funding required to requested budget
- □  C. Ad-hoc funding based on needs of EMS.

B.5: List the private organizations that give funding for the EMS, and an estimate of the funding provided (including currency used).

B.6: Are insurance schemes used for EMS?  Yes / No If YES, please stipulate who provides the insurance schemes:
- □  A. Government and/or MoH
- □  B. Private organization
- □  C. Combination A & B
- □  D. Employers

B.7: Are the insurance schemes:
- □  A. Compulsory
- □  B. Voluntary
- □  C. Supplementary
- □  D. Combination A, B & C

B.8: Who pays for the insurance premiums:

□   A. MoH / Government
□   B. Individuals
□   C. Private organizations / employers
□   D. Combination A, B & C

B.9: Please indicate how each of the following EMS component parts are financed:

| Component | Source |
|---|---|
| □   Communications | |
| □   Dispatch | |
| □   Medical first responders | |
| □   Fire and rescue responders | |
| □   Pre-hospital emergency care providers | |
| □   Purchase of EMS vehicles | |
| □   Maintenance and operational costs of EMS vehicles | |

**PART III**
**EMERGENCY MEDICAL SERVICE TRAINING**

C.1: Is emergency medicine (for physicians) a recognized/accredited medical specialty? If YES, please provide the list and references to the appropriate normative acts.

C.2: Are there other non-specialized or specialized professionals (registered/accredited specialties and/or professions) working in EMS system?  Please provide a description of the training program for each group ticked.
□   First-responders
□   Emergency Medical Technicians (EMT) Basic
□   EMT-Intermediate
□   EMT-Advanced or Paramedic
□   Emergency Nurse
□   Emergency First Responder
□   Public safety answering points (PSAPs) personnel
□   Emergency control center (ECC) personnel
□   EMS manager
□   Other, please indicate:

C.3:  Is there a state (national or sub-national) authority responsible for the regulation of the EMS education system (course authorization, curricula review, licensing of instructors, specialty accreditation, etc.)? If NOT, please go to Question C.10.

C.4: Describe the authority's responsibilities in the field of EMS training as established by the current regulations. Please refer to appropriate regulations. Does the authority establish admission plans for EMS education institutions?

C.5: Describe the authorization/accreditation practices and procedures for the different education/ training programs and for EMS education institutions. Refer to appropriate regulations. Please refer to the entire training chain – i.e. development of training materials, lecturer qualification, etc.

C.6: Are there established national minimum guidelines and competencies for EMS training curricula? If YES, please provide the requirements for each EMT certification level and emergency medicine.

C.7: Describe the practices and procedures for EMS training curricula review. Please refer to the appropriate regulations.

C.8: Which are the certification periods for EMS specialties/professions mentioned at Question C.2.

C.9: Does the current legislation establish fees for EMS specialty certification? If YES, please indicate the fees for each EMT certification level and emergency nurse, emergency physician.

C.10: Are there regulations in force requiring individuals entering or reentering the EMS field,

mentioned at Question C.2, that require them to complete an accredited training program and to pass regional and/or national certification exams? If NOT, please go to Question C.17.

C.11: Describe the eligibility requirements, in the current the legislation, for EMT education, according to certification levels, and emergency medicine (nurse and physician).

C.12: Please indicate curricula topic categories for each EMT certification level and emergency medicine. Attach the list of appropriate documents.

C.13: What are the minimum classroom hours and didactic practice hours (in both a medical facility setting and onboard an ambulance) for each EMT certification level and emergency medicine? In case of emergency medicine, please indicate how long is the residency training?

C.14: Describe the minimum skills to be demonstrated at the completion of each training course/ program to be eligible for each EMT certification level and emergency medicine.

C.15: Describe the recertification (continuing education) requirements for each EMT certification level and emergency medicine (e.g. credits and didactic practice). Please refer to minimum skill required for course/program graduation.

C.16: Describe the procedures of written and practical certification and re-certification examination for each EMT certification level and emergency medicine.

C.17: Which institutions ensure pre-service EMS education for specialties/professions mentioned at Question C.2? For each selected category, please provide the list of education institutions (Note: the list must include name and address of the institution).
□   First-responders degree programs
□   Technical schools and community colleges
□   Medical colleges / Nurse Schools (medium education institutions)
□   Medical Universities
□   Public Health Schools
□   Other institutions, please indicate:

C.18: Are there any type of requirements, for specialties/professions mentioned at Question C.2, on EMS continuing education to maintain certification? If YES, please provide the list of education institutions which offer in-service training (Note: the list must include name and address of the institution).

C.19: Are there local or national level EMS training institutions (e.g. non-accredited, etc.) or EMS providers that provide pre-service and in-service training and individually define the breadth and depth of training content, and employ their own training standards? If YES, please provide the list (Note: the list must include name and address of the institution).

C.20: Are there organized centers for medical simulation or medical simulation classrooms for EMS

students? If NOT, please describe how the EMS didactic practice is organized in the framework of the education program.

C.21: Is the EMS education for specialties mentioned at Question C.2 (pre-service and in-service) state financed? If NOT, please indicate the fees for each EMS specialty.

C.22: Is there a Register of EMS specialist mentioned at Question C.2 at a local or national level? If NOT, please go to Question C.25.

C.23: Name the institution(s) responsible for the maintenance of the EMS specialists Register. Describe practices and procedures for EMS specialists register maintenance. Attach the appropriate regulations.

C.24: Provide the register structure or the categories of data in the Register.

C.25: Can a resident or citizen of your country who is currently licensed as an EMT, emergency nurse or emergency physician in another jurisdiction or country be certified by endorsement? If NOT, please go to Question C30.

C.26: Which is the authority responsible for EMS certification endorsement?

C.27: Describe the procedures and practices for EMS certification through reciprocity. Provide the list and references to the appropriate normative acts or regulations.

C.28: Describe the procedures and practices for EMS certification through legal recognition. Provide the list and references to the appropriate normative acts or regulations.

C.29: Does the current legislation establish fees for EMS certification endorsement? If YES, please indicate the fees for each EMT certification level and emergency nurse, emergency physician.

C.30: Please describe the training and certification process of EMS first-responders. Attach the appropriate standards and/or regulations. The following issues shall be mandatorily covered:
= Initial course certification
= Re-certification eligibility and requirements
= Evaluation for re-certification
= Certification by endorsement.

C.31: Please describe the training and certification process of PSAPs and ECC personnel. Attach the appropriate standards and/or regulations. The following issues shall be mandatorily covered:
= Initial course certification
= Re-certification eligibility and requirements
= Evaluation for re-certification
= Certification by endorsement.

C.32: Does the education curricula for EMT, emergency nurse or emergency physician mandatorily include training programs for crisis and disaster management? If YES, please describe the minimum guidelines and course competencies.

**PART IV**
**EMS COMMUNICATIONS STANDARDS**

**Section: Public access to EMS Service**

D.1: Is there a National Numbering Plan in force? If NOT, please go to Question D.5.

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D.2: Is the National Numbering Plan aligned with international standards in the field (i.e. ITU-T Recommendation E.164, etc.).

D.3: Which is the authority responsible for regulation and coordination of the numbering resource of the country?

D.4: In which category/level of the National Numbering Plan are included the Emergency Services (including EMS as commercial services, if applicable)?

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D.5: Please specify which policy document acts as a National Numbering Plan.

D.6: What are the definitions for "emergency services" and "emergency number" established by the regulations in the field of telecommunications?

D.7: Is there a single emergency number to access all emergency services (police, fire and ambulance)? If NOT, please go to Question D.13.

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D.8: Is 112 or 911 one of the single emergency number to access emergency services? If NOT, please provide the country specific single emergency number.

D.9: Please list the emergency services included through the single emergency number.

D.10: In addition to a primary emergency number, is there a secondary emergency number? If YES, are the calls to this number re-routed to the primary emergency number?

D.11: Is calling the single emergency number or other emergency numbers free of charge?

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D.13: Which are the recognized country emergency services and the allocated emergency numbers for these? *Please refer to all Level 1 emergency services/helplines – police, fire, ambulance, disaster management, etc., as well as other country specific emergency services – women and child helpline, highway and railway accident helplines, blood bank, etc. Please also indicate which numbers are free of charge from the point of view of the caller, and/or which are free to the organization being called (e.g., toll-free vs short-code).*

D.14: Have EMS providers set up their helplines for medical emergencies? If NOT, please go to Question D.16.

D.15: Please briefly describe/reproduce the current regulations for (i) eligibility to apply for numbering resource (e.g. with a specific focus on emergency services); (ii) application process for an allocation of numbering resources; (iii) assessment criteria for an allocation of numbering resources; (iv) regulatory fees for managing numbering resources.

D16: Can emergency services be contacted through SMS, mobile applications or VoIP, etc.? Are there any pilot projects developed by public and private sector companies and individuals that can send an alert to emergency services? If YES, please provide details about the applied interoperability standards and if the deployed apps are compatible with the utilized technologies?

D.17: Are there designed plans and policies to introduce single emergency number taking into consideration the relevant ITU-T Recommendations?

D.18: Are users able to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network (public telephones, dedicated call post with voice application, private coin and card payphones)? If NO, please got to Question D.20.

D.19: Do all telephony terminal equipment enable the emergency call when:
- □ Normal Originating Telecommunications Services have been barred;
- □ Equipment (e.g. USIM) is protected by an authentication procedure, unknown to the user in advance;
- □ Using a mobile phone for an emergency call is outside the coverage area;
- □ An inactive SIM;
- □ A handset without a SIM allowed.

D.20: Is the originating network able to recognize emergency calls by means of the emergency call number (i.e. single emergency number – 112 or 911 and local national emergency numbers)? If NOT, please go to Question D.24.

D.21: Does the originating telecom network generate call-related information – automatic number identification (ANI), automatic location identification (ALI), Calling Line Identity (CLI) and transmit this information to public safety answering points (PSAPs)?

D.22: Is the PSAP/Emergency Control Center (ECC) able to return a call to the number in the CLI?

D.23: If the originating network is not connected directly to the PSAP is a transit network used between the two? If YES, does the transit network forward/transfer the emergency call received from the originating network together with the call-related additional information immediately and without modification to the PSAP?

D.24: Do all network operators (both fixed-line and mobile) give priority to emergency calls over all other calls?

D.25: Are there any legal responsibilities for the terminating network and the PSAPs to permanently

monitor the functionality and transmission quality of the transmission lines? If NOT, please go to Question D.27.

D.26: Briefly describe the procedures established by the regulations in force in case of (i) technical modifications and maintenance; (ii) transmission quality below minimum standard; (iii) network deactivation or out of order; (iv) standard capacity is fully utilized; etc.

**Section: EMS Dispatch and Control**

D.27: Please describe the pathway/architecture of the emergency call from EMS caller to emergency team dispatch.

D.28: Please indicate to which category the PSAP can be attributed?
□   Referral - Personnel at the PSAPs answer the phone, ask pertinent questions, such as the nature of the emergency and location, and then advise the calling party of the proper number to call;
□   Relay - The PSAP answers the phone, acquires all necessary information from the caller and then relays the message to the appropriate agency. The caller does not interact or speak directly with the responding or dispatching agency and is not always available to answer further questions, in case they develop during a response;
□   Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call directly to the appropriate responding agency;
□   Direct - The PSAP answers the phone, acquires all information from the caller, and then directly dispatches the necessary response units.

D.29: Please describe the following issues related to PSAPs and ECCs:
(i) Total number of PSAPs and ECCs?
(ii) Are they covering national level, regional level and/or sub-regional level?
(iii) Based on which criteria the number of PSAPs and ECCs is established?

D.30: In your country, is there a legal framework to regulate the activity of PSAPs and ECCs? If NOT, please go to Question D.36.

D.31: Briefly describe the regulated areas.

D.32: Is there a state/regional-level or multi-disciplinary organization that works towards overall coordination and control of authorized PSAPs and ECCs?

D.33: Do Standard Operating Procedures of the PSAPs and ECCs follow national standards/protocols or does each PSAP and ECC have its own SOPs?

D.34: Are there in force standardized PSAP and ECC facility requirements? If YES, please describe.

D.35: Are there in force requirements regarding minimum technical standards for telecommunications equipment in cases of PSAP and ECC? If YES, please describe.

D.36: What type of communications technologies are used at PSAP and ECC level?
- □ Land mobile radio systems (LMRS), including VHF Radio Systems, UHF Radio Systems, public safety radio frequencies;
- □ Landline Telephone Systems;
- □ Cellular Telephone Systems;
- □ WIFI Systems;
- □ IP Data Networks/Fiber Optic Connections;
- □ Land Mobile Satellite Communications;
- □ Other, please specify.

D.37: Are all PSAPs and ECCs equipped with a computer aided dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)? If YES, answer the Question D.38 and then go to Question D.40. If NOT, please go to Question D.39.

D.38: Is the CAD or AMPDS capable of recording incident information, location verification, incident display, unit display, incident dispatch, integration with mobile data terminals and unit recommendation, time stamping and mapping, systematic categorization and prioritization of calls according to the clinical urgency of patient's condition? If YES, please provide the call prioritization categories (i.e. categories of emergencies and criteria for response time).

D.39: Please describe the SOPs for manual dispatch. Please refer to call prioritization and re-prioritization, management of the resource logs, assignment of vehicles and crews to duty, resource ambulances to calls, call log record, call closing, and SELCALL information capture?

Section: Interagency Communication for EMS

D.40:  Do EMS communication systems provide a means of communication to enable medical and logistical coordination between EMS field personnel, emergency department and other public safety agencies?
List the formal communication paths established in the emergency system:
- □ PSAP – all public safety agencies (fire, police, EMS, etc.)
- □ Communication between all public safety agencies
- □ First Responder team to ambulance
- □ First Responder team to dispatch
- □ First Responder to medical control
- □ ECC/Medical control to Ambulance
- □ Telemetry from Ambulance
- □ Ambulance to dispatch
- □ Ambulance to ambulance
- □ Ambulance to hospital
- □ Hospital ED to dispatch
- □ Hospital to hospital
- □ Helicopter to dispatch
- □ Ambulance to helicopter

□   Helicopter to hospital.

If NOT, please go to Question D.44.

D.41: Are there specific legal provisions regarding interagency coordination for emergency situations (e.g. notification regarding vehicle accidents and potential or actual crime related incidents, apparent hazards brought to the attention of the EMD, response for hazardous material incidents, etc.)? Please refer to normative acts in force.

D.42: Are there regulations in force, including SOPs, for simultaneous dispatch to the scene of an incident of different emergency services or of multi-disciplinary teams? If YES please describe the procedures.

D.43: Are there standards and procedures (both administrative and technical) for communications between (i) emergency teams of different services while in the field and (ii) emergency teams of the same service while in the field? If YES, please describe.

D.44: Are there any regulations in force regarding the utilization of frequencies specified as reserved for "Emergency Medical" If NOT, please go to Question D.47.

D.45: Name the authority responsible for designation of radio frequencies for use by emergency services?

D.46: What are the regulations for radio frequencies to be licensed and used according to the approved standards (please refer mandatorily to VHF channels for dispatch of EMS resources - base and mobile use; UHF channels and CTCSS codes)?

D.47: Are there minimum technical standards for EMS to hospital communication? If NOT, please go to Question D.50.

D.48: Is there, at national or regional level, a reserved frequency for use only for communication between EMS providers and hospitals regarding provision of patient care?

D.49: Please describe the minimum technical standards, including the requirements regarding the equipment to be used.

D.50: Are there regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)? If NOT, please go to Question D.54.

D.51: Please describe the regulated areas.

D.52: Are all the licensed EMS vehicles required to have the capability to communicate with ECCs and receiving hospitals or all hospitals from the region/state?

D.53: Which categories of EMS vehicles shall provide equipment for reliable voice communication

from outside of the vehicle ("patient side") to hospital?

D.54: Do the current regulations permit licensed EMS vehicles use of dispatch radio systems other than public-safety owned and operated equipment in a channel-sharing environment (i.e. cell phones, trunking systems, etc.)? If YES, is there any legal responsibility for EMS provider to maintain evidence of priority system access or to demonstrate system access on at least 99% of all transmission attempts?

Section: Medical Control Communication

D.55 Does the EMS pathway include Medical Control? If YES, please answer Questions D.56 – D.60.

D.56: Is the Medical Control integrated part of ECCs or of the receiving medical facility?

D.57: Are there approved regulations when to contact Medical Control? Are First Responders empowered to communicate with Medical Control or this is a specific function for ambulance service (Advance and Basic Life Support, etc.)?

D.58: Describe methods for contact with Medical Control.

D.59: Are there other methods for data transmission besides voice in order to increase the effectiveness of the whole rescue process? If YES, please describe the used technologies that complement the basic voice call.

D.60: Do Medical Control query patient related information from other sources (e.g. eHealth systems – HER, HIE, etc.)?

# Annex 2: Technical Annex – Calculation of Costs and Benefits of PECS

This annex provides further details on the calculations used in Chapter 1 of the report, specifically with respect to Section V.

**Estimated per Capita Costs – Tanzania and Malawi**

These costs were estimated based on a crew of three persons per ambulance (two paramedics plus one driver), with all ambulances staffed around the clock (24/7/365). Considering leave (sick leave, annual leave, statutory holidays, etc.) and time off for training and other non-work activities, it was assumed that 4.5 full-time equivalent staff would be required to fully staff one position. The number of ambulances required were calculated based on the current population estimates for each country, and the assumed service intensity in terms of ambulances per million population. Staff salaries reflect the estimated cost, including benefits in both Tanzania and Malawi. Non-staffing costs per call were based on the detailed costing done in Bulgaria, on the assumption that these would likely not differ materially from country to country. It was assumed that each ambulance would do an average of 3,500 calls per year, keeping in the mid-range of overall productivity. Capital costs (vehicles, equipment, training) were based on recent estimates of such costs in both Tanzania and Malawi, amortized over a 5-year period.

**Burden of Disease – Malawi and Tanzania**

The population data was taken from the UN Population Division, and both the estimated numbers of deaths and years of life lost (YLL) were taken from the 2015 WHO Global Health Estimates.

**Potential Gains from PECS in Malawi and Tanzania**

Recognizing that the overall state of the health systems in Tanzania and Malawi are generally less developed than those of the comparison countries, it was assumed that it would not be possible to achieve the same level of morality reduction as these countries. Without an objective indication of how different the impact might be, the analysis used quite conservative assumptions, with a low estimate of just 10 percent of the comparison country impact in terms of deaths avoided, a medium estimate of 20 percent and a high estimate of 30 percent. The only deviation from this approach is in the area of maternal and neonatal conditions where the high estimate was set at the level estimated in India and the medium and low estimates were scaled accordingly. The table below shows the estimates used.

|  | | Percent avoided | | |
|---|---|---|---|---|
|  | | Low est. | Med. est. | High est. |
| Estimated Deaths avoided | IHD | 1.1% | 2.2% | 3.3% |
| | CVD | 2.2% | 4.4% | 6.6% |
| | Mat | 2.1% | 2.6% | 3.1% |
| | Neo | 2.1% | 2.6% | 3.1% |
| | RTI | 5.0% | 10.0% | 15.0% |

The "estimated deaths avoided" simply multiplies the actual current number of deaths in each category/country by the estimated percent of deaths avoided for each scenario. Then the "YLL (Years of Life Lost) Avoided" is then calculated based on the average number of YLL per death in each category/country. Similar calculations were done to obtain an estimate for the impact on SSA as a whole. The total YLL avoided for each country were then calculated and divided by the estimated cost for each country to get an average cost per YLL avoided. This was then compared to the average GDP per capita to determine how the intervention fared against the WHO guideline.

# Annex 3: Key Design Parameters - Establishment of a National Ambulance Service (NAS) in Sierra Leone

**Scope of NAS Operations**

| Service Coverage | Key Considerations |
|---|---|
| Pre-hospital emergency care | Need 24/7 coverage; team location based on (a) projected call volume and, (b) response time targets |
| Urgent inter-facility transport | Need 24/7 coverage; teams should be close to facilities (either sending or receiving) |
| Non-urgent inter-facility transport | Mainly day-time coverage needed; lower level of staff training OK |
| Aeromedical transport | Very expensive to establish and maintain – not recommended at this time |

| Types of calls | Key Considerations |
|---|---|
| Trauma (e.g., MVA) | Need to look at road networks and traffic patterns |
| Emergency obstetrics | Need teams close to sending facilities |
| Other emergency referrals | Type and nature of expected calls would determine optimal team location |
| Medical calls (stroke, heart attack, etc.) | This would likely constitute the majority of NAS calls if included |

**Size and Locations of Teams**
Most systems use a "triangulation" process of a variety of approaches.

| Approach | Potential calculation | Implication on # teams |
|---|---|---|
| Total population | 8-12 calls per 100 people annually | 400,000 to 600,000 calls nationwide, # teams depend on efficiency considerations (see below *) |
| Burden of disease | Need more details on BoD | |
| Standards | e.g., Bulgaria: 1 team/35,000 people if density > 76.6 per sq. km., and 1 team per 700 sq. km. if density < 76.6 persons per sq. km. | If applied at the district level, results in a need for 160 teams |

| Distance (radius) | To achieve 30 min. rural response time radius of 10-15 km might be used | 10 km => 228 teams<br>12 km => 158 teams<br>15 km => 101 teams |
|---|---|---|
| Efficiency | Potential target "unit hour utilization" (UHU) of 0.30 to 0.40 (7.2 to 9.6 calls per 24 hours per crew) | Based on Total pop. # (*)<br>0.30 => 152-228 teams<br>0.40 => 117-171 teams |

## Key Functions and Organizational Options

| Function | Key Considerations |
|---|---|
| PECS system management | If PPP is utilized to run the NAS, will likely need a small unit in the MOHS for executive oversight and contract management |
| Corporate services | Need to determine who will do what (see PPP section), including role of MOHS |
| Information systems | Extent of linkage to MOHS systems needs to be determined |
| Dispatch centers | Location and management of centers need to be determined |
| Fleet and facilities | (a) Need to decide on facilities for teams/vehicles,<br>(b) Need to decide on types of vehicles (long run)<br>(c) Need to decide on vehicle replacement policy |
| Clinical oversight | Need to determine role of MOHS/GoSL in:<br>(a) medical advisory committee<br>(b) protocol development and/or approval<br>(c) quality assurance<br>(d) training and continuing professional development<br>(e) licensing and scope of practice |
| Legislation/regulation | Determine necessary legal/regulatory changes needed to operationalize NAS, and to protect/ incentivize community engagement |

## Composition, Organization and Training of Teams

| Aspect | Options | Implications |
|---|---|---|
| Role of drivers | (a) dedicated drivers with minimal or no training,<br>(b) paramedics who also drive, both of whom have equal levels of training | (a) increased numbers of staff (3 per car/shift)<br>(b) also need to train paramedics to drive |

| Staff per team | (a) 3-person team (2 paramedics plus driver<br>(b) 2-person team (2 paramedics) | (a) need 13.5 staff for each 24-hour team<br>(b) need 9 staff/team |
| --- | --- | --- |
| Level of training | (a) Basic life support (BLS), minimum level of training<br>(b) BLS supplemented by advanced life support (ALS) in selected areas<br>(c) Intermediate level emergency medical technicians (EMT-I) only<br>(d) EMT-I plus ALS<br>(e) ALS only<br>(f) Use of volunteers/first responders | (a) limited types calls can be handled, basic vehicles and equipment needed<br>(b) higher expense for ALS, limited coverage, different ALS vehicles<br>(c) increased level of training throughout system<br>(d) higher expense, need specialized ALS vehicles<br>(e) highest cost option, need specialized vehicles<br>(f) need volunteer culture in country |
| Length of training | (a) BLS – 4 to 6 weeks (US), 16 wks. (UK)<br>(b) EMT-I – 1 to 2 years (US, CA, UK)<br>(c) ALS – 2 to 3 years (US, CA, UK)<br>(d) First responders – 1 to 3 weeks | (a) limited scope/skills<br>(b) working level in many PECS services<br>(c) expensive, need to maintain specialized skills<br>(d) can aid response |
| Shift patterns | Need further analysis to determine what shift patterns are appropriate | |

## Scope of Public-Private Partnership

| Area of Coverage | Key Considerations |
| --- | --- |
| Contracting out of all aspects of NAS | Need qualified bidders available and interested in providing the service (and all aspects thereof)<br>More than likely consortia would need to be formed |
| Facilities development and management | Would attract different types of bidders with specific expertise in facilities management/ financing |
| Fleet management | Would attract different types of bidders with specific expertise in fleet management |

| Training | Would attract different types of bidders with specific expertise in medical training, but would still need linkages with NAS for on-car field-based training |
| | Can training requirements/arrangements be linked to the proposed Medical College PPP project? |
| Hybrid approach with different contracts for different aspects | Would need to be explored further |
| Role of local service providers in the PPP | Determine the role of international operators versus local providers, including how this would work (separate contract, sub-contracting, etc.) |

**Implementation**

| Options | Key Questions |
| --- | --- |
| Set up entire network from day one | Can sufficient staff be trained to launch a full NAS in one go? Requirements for infrastructure and support systems? |
| Phased approach: geographic or by type of service | Geographic or type of service phasing? If geographic, which districts/regions go first? If by service, which type of service should go first, second, etc.? Non-urgent patient transport, Urgent inter-facility transport, Pre-hospital emergency care (depends on selected scope of services – see above) How long should a phased approach need? |

# Annex 4: SSA Country Profiles – State of EMS Systems

The SSA country profiles aggregate data collected with the questionnaire available in Annex 1, to provide an analysis of the state of EMS systems in every SSA country that participated in the survey.

The country profiles are arranged alphabetically as follows:

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇧🇮 Burundi

**Survey completion[1]: 33% - Medium**

## EMS Standards

✅ **Right to care enshrined by Constitution or organic laws**

**Model/approaches to organize and regulate pre-hospital emergency care:**
- ☑ National system
- ☐ Local or regional systems
- ☑ Private systems
- ☐ Hospital-based systems
- ☑ Public service integrated with Civil Protection Authority
- ☑ Fire service and/or police
- ☑ Volunteer systems
- ☐ Hybrid systems

**Authority responsible for development of EMS policies and accountable for EMS system:**
Ministry of Health

**Leading authority in crisis/disaster response:**
Ministry of Public Safety

**Legal requirement for EMS providers[2]**
- ☑ Accreditation
- ☐ Licensing
- ☐ Other types of authorization

NA/NR **EMS standards state that an inspection to be regularly carried out***

*(Governance)*

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NA/NR **National level operational policies and protocols applicable to all authorized EMS providers[2], or**

NA/NR **Each EMS agency/provider have its own policies[2]**

NA/NR **Requirement to submit a copy of EMS patient report to patient at the time of transfer**

✅ **Mechanisms in place to measure and/or monitor patient satisfaction and/or patient experience**

**Out-of-hospital triage protocols followed:**
NA/NR

**Triage policy in transporting patients applied**
- ☐ Resource-Based START
- ☐ Non-conveyance
- ☑ Other (i.e. severity of patient's clinical condition)

**Policy regarding which hospital the patient will be transported to for emergency care**
- ☐ Normative judgments: designated hospital catchment area
- ☐ Nearest emergency department with available beds
- ☑ Complex method: candidate Emergency Departments' available capacities
- ☑ Waiting times, and distances from the incident scene
- ☐ No policy in place

*(Service Delivery)*

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NA/NR **Approved methodologies/regulations for planning and forecasting EMS personnel needs[2]**

NA/NR **Approved methodologies/regulations for planning and forecasting EMS vehicle needs[2]**

✅ **EMS vehicle staff requirements**
- ☑ Driver + 1 (1 EMT or Nurse)
- ☐ Driver + 2 (1 Basic EMT and 1 Advanced EMT)
- ☐ Driver + 2 (1 Physician and 1 Nurse or Paramedic)
- ☐ Driver + 3 (1 Physician, 1 Nurse, 1 Patient Transport Assistant)

*(Resources)*

## EMS Financing

**EMS financing areas covered by regulations[2]**
- ☑ Healthcare funds allocation
- ☑ Coverage schemes
- ☑ Exemption policies
- ☑ Tariffs
- ☑ Fees for non-covered
- ☑ Contracting health services
- ☑ Reimbursement
- ☐ Stewardship and oversight of payer organization
- ☑ Incentivize providers for efficiency and quality care
- ☐ Provider control and audit

**Legal provisions regarding the mechanisms for allocating funds for EMS[2]**
- ☐ Ad-hoc based on current needs
- ☑ EMS budget (without specifications) for Ministries with responsibilities in the field of crisis
- ☐ Share from MoH budget

NA/NR **Emergency medical services provided to households and individuals free of charge**

✅ **Insurance schemes used for EMS**
Who provides the insurance schemes:
- ☑ Government and/or MoH
- ☑ Private organizations
- ☑ Employers

**How the EMS is funded**
- ☑ MoH budget
- ☐ Separate government budget from MoH
- ☐ Private sector sources only
- ☑ User pays

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%
[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇧🇮 **Burundi**

**Survey completion[1]: 33% - Medium**

## EMS Training

❌ **Accreditation of emergency medicine as a medical specialty**

NA/NR **Regulations requiring to complete an accredited EMS training program**

NA/NR **Existing register of EMS professionals at a local or national level**

NA/NR **Training in crisis and disaster management included in EM curriculum[2]**

NA/NR **Institutions ensuring pre-service EMS education for specialties/professions**
- ☐ First-responders degree programs
- ☐ Technical schools and community colleges
- ☐ Medical colleges / Nurse Schools (medium education institutions)
- ☐ Medical Universities
- ☐ Public Health Schools
- ☐ Other institutions

## EMS Communications

### Public Access

✅ **National Numbering Plan in force**

NA/NR **Single emergency number to access all emergency services**

✅ **Single emergency number or other emergency numbers free of charge**

✅ **Ability to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network**

**Other communication technologies used to contact EMS:**
Mobile Applications

### Dispatch and Control

**Category the PSAP can be attributed to**
- ☐ Referral - The PSAPs answer the phone, ask pertinent questions and then advise the calling party of the proper number to call
- ☐ Relay - The PSAP answers the phone, gets all necessary information and then relays the message to the appropriate agency
- ☐ Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call to the appropriate responding agency
- ☑ Direct - The PSAP answers the phone, gets all information from the caller, and then directly dispatches the necessary response units

**Type of communications technologies used at PSAP and ECC levels[2]**
- ☐ Land mobile radio systems (LMRS)
- ☑ Landline Telephone Systems
- ☐ Cellular Telephone Systems
- ☐ WIFI Systems
- ☐ IP Data Networks/Fiber Optic Connections
- ☐ Land Mobile Satellite Communications
- ☐ Other

NA/NR **Legal framework to regulate the activity of PSAPs and ECCs[2]**

✅ **PSAPs and ECCs equipped with a Computer Aided Dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)**

### Interagency Communication

NA/NR **EMS financing areas covered by regulations:**
- ☐ PSAP – all public safety agencies (fire, police, EMS, etc.)
- ☐ Communication between all public safety agencies
- ☐ First Responder team to ambulance
- ☐ First Responder team to dispatch
- ☐ First Responder to medical control
- ☐ ECC/Medical control to ambulance
- ☐ Telemetry from ambulance
- ☐ Ambulance to dispatch        ☐ Hospital to hospital
- ☐ Ambulance to ambulance      ☐ Helicopter to dispatch
- ☐ Ambulance to hospital        ☐ Ambulance to helicopter
- ☐ Hospital ED to dispatch      ☐ Helicopter to hospital

NA/NR **Regulations in force regarding the utilization of frequencies reserved for "Emergency Medical"**

NA/NR **Minimum technical standards for EMS to hospital communication[2]**

✅ **Regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)[2]**

NA/NR **The EMS pathway include Medical Control**

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[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%

[2] Quality and comprehensiveness of regulations are not included

[3] NA/NR: Data not available or no response given

## References

World Bank, The State of Emergency Medical Services (EMS) in Sub-Saharan Africa, 2021

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇧🇫 Burkina Faso

**Survey completion[1]: 27% - Low**

## EMS Standards

**Governance**

✅ **Right to care enshrined by Constitution or organic laws**

**Model/approaches to organize and regulate pre-hospital emergency care:**
- ☑ National system
- ☐ Local or regional systems
- ☐ Private systems
- ☐ Hospital-based systems
- ☐ Public service integrated with Civil Protection Authority
- ☐ Fire service and/or police
- ☐ Volunteer systems
- ☐ Hybrid systems

**Authority responsible for development of EMS policies and accountable for EMS system:**
Ministry of Health

**Leading authority in crisis/disaster response:**
NA/NR

NA/NR **Legal requirement for EMS providers[2]**
- ☐ Accreditation
- ☐ Licensing
- ☐ Other types of authorization

NA/NR **EMS standards state that an inspection to be regularly carried out***

**Service Delivery**

✅ **National level operational policies and protocols applicable to all authorized EMS providers[2], or**

❌ **Each EMS agency/provider have its own policies[2]**

✅ **Requirement to submit a copy of EMS patient report to patient at the time of transfer**

NA/NR **Mechanisms in place to measure and/or monitor patient satisfaction and/or patient experience**

**Out-of-hospital triage protocols followed:**
NA/NR

NA/NR **Triage policy in transporting patients applied**
- ☐ Resource-Based START
- ☐ Non-conveyance
- ☐ Other (i.e. severity of patient's clinical condition)

NA/NR **Policy regarding which hospital the patient will be transported to for emergency care**
- ☐ Normative judgments: designated hospital catchment area
- ☐ Nearest emergency department with available beds
- ☐ Complex method: candidate Emergency Departments' available capacities
- ☐ Waiting times, and distances from the incident scene
- ☐ No policy in place

**Resources**

NA/NR **Approved methodologies/regulations for planning and forecasting EMS personnel needs[2]**

NA/NR **Approved methodologies/regulations for planning and forecasting EMS vehicle needs[2]**

❌ **EMS vehicle staff requirements**
- ☐ Driver + 1 (1 EMT or Nurse)
- ☐ Driver + 2 (1 Basic EMT and 1 Advanced EMT)
- ☐ Driver + 2 (1 Physician and 1 Nurse or Paramedic)
- ☐ Driver + 3 (1 Physician, 1 Nurse, 1 Patient Transport Assistant)

## EMS Financing

**EMS financing areas covered by regulations[2]**
- ☑ Healthcare funds allocation
- ☐ Coverage schemes
- ☐ Exemption policies
- ☐ Tariffs
- ☐ Fees for non-covered
- ☐ Contracting health services
- ☐ Reimbursement
- ☐ Stewardship and oversight of payer organization
- ☐ Incentivize providers for efficiency and quality care
- ☐ Provider control and audit

NA/NR **Legal provisions regarding the mechanisms for allocating funds for EMS[2]**
- ☐ Ad-hoc based on current needs
- ☐ EMS budget (without specifications) for Ministries with responsibilities in the field of crisis
- ☐ Share from MoH budget

NA/NR **Emergency medical services provided to households and individuals free of charge**

✅ **Insurance schemes used for EMS**
Who provides the insurance schemes:
- ☑ Government and/or MoH
- ☑ Private organizations
- ☑ Employers

**How the EMS is funded**
- ☑ MoH budget
- ☐ Separate government budget from MoH
- ☐ Private sector sources only
- ☐ User pays

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%
[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇧🇫 Burkina Faso

**Survey completion[1]: 27% - Low**

## EMS Training

✅ Accreditation of emergency medicine as a medical specialty

NA/NR Regulations requiring to complete an accredited EMS training program

NA/NR Existing register of EMS professionals at a local or national level

NA/NR Training in crisis and disaster management included in EM curriculum[2]

**Institutions ensuring pre-service EMS education for specialties/professions**

☐ First-responders degree programs
☐ Technical schools and community colleges
☐ Medical colleges / Nurse Schools (medium education institutions)
☑ Medical Universities
☑ Public Health Schools
☐ Other institutions

## EMS Communications

**Public Access**

✅ National Numbering Plan in force

NA/NR Single emergency number to access all emergency services

✅ Single emergency number or other emergency numbers free of charge

NA/NR Ability to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network

**Other communication technologies used to contact EMS:**
NA/NR

**Dispatch and Control**

**Category the PSAP can be attributed to**

☐ Referral - The PSAPs answer the phone, ask pertinent questions and then advise the calling party of the proper number to call
☑ Relay - The PSAP answers the phone, gets all necessary information and then relays the message to the appropriate agency
☐ Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call to the appropriate responding agency
☐ Direct - The PSAP answers the phone, gets all information from the caller, and then directly dispatches the necessary response units

NA/NR Legal framework to regulate the activity of PSAPs and ECCs[2]

NA/NR **Type of communications technologies used at PSAP and ECC levels[2]**
☐ Land mobile radio systems (LMRS)
☐ Landline Telephone Systems
☐ Cellular Telephone Systems
☐ WIFI Systems
☐ IP Data Networks/Fiber Optic Connections
☐ Land Mobile Satellite Communications
☐ Other

NA/NR PSAPs and ECCs equipped with a Computer Aided Dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)

**Interagency Communication**

NA/NR **EMS financing areas covered by regulations:**
☐ PSAP – all public safety agencies (fire, police, EMS, etc.)
☐ Communication between all public safety agencies
☐ First Responder team to ambulance
☐ First Responder team to dispatch
☐ First Responder to medical control
☐ ECC/Medical control to ambulance
☐ Telemetry from ambulance
☐ Ambulance to dispatch
☐ Ambulance to ambulance
☐ Ambulance to hospital
☐ Hospital ED to dispatch
☐ Hospital to hospital
☐ Helicopter to dispatch
☐ Ambulance to helicopter
☐ Helicopter to hospital

NA/NR Regulations in force regarding the utilization of frequencies reserved for "Emergency Medical"

NA/NR Minimum technical standards for EMS to hospital communication[2]

NA/NR Regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)[2]

NA/NR The EMS pathway include Medical Control

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[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%

[2] Quality and comprehensiveness of regulations are not included

[3] NA/NR: Data not available or no response given

## References

World Bank, The State of Emergency Medical Services (EMS) in Sub-Saharan Africa, 2021

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇨🇫 Central African Republic
**Survey completion[1]: 26% - Low**

## EMS Standards

**Governance**

✅ **Right to care enshrined by Constitution or organic laws**

**Model/approaches to organize and regulate pre-hospital emergency care:**
- ☐ National system
- ☐ Local or regional systems
- ☐ Private systems
- ☐ Hospital-based systems
- ☐ Public service integrated with Civil Protection Authority
- ☐ Fire service and/or police
- ☐ Volunteer systems
- ☑ Hybrid systems

**Authority responsible for development of EMS policies and accountable for EMS system:**
Ministry of Health

**Leading authority in crisis/disaster response:**
Ministry of Health

NA/NR **Legal requirement for EMS providers[2]**
- ☐ Accreditation
- ☐ Licensing
- ☐ Other types of authorization

NA/NR **EMS standards state that an inspection to be regularly carried out***

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**Service Delivery**

NA/NR **National level operational policies and protocols applicable to all authorized EMS providers[2], or**

NA/NR **Each EMS agency/provider have its own policies[2]**

NA/NR **Requirement to submit a copy of EMS patient report to patient at the time of transfer**

NA/NR **Mechanisms in place to measure and/or monitor patient satisfaction and/or patient experience**

**Out-of-hospital triage protocols followed:**
NA/NR

**Triage policy in transporting patients applied**
- ☐ Resource-Based START
- ☐ Non-conveyance
- ☑ Other (i.e. severity of patient's clinical condition)

NA/NR **Policy regarding which hospital the patient will be transported to for emergency care**
- ☐ Normative judgments: designated hospital catchment area
- ☐ Nearest emergency department with available beds
- ☐ Complex method: candidate Emergency Departments' available capacities
- ☐ Waiting times, and distances from the incident scene
- ☐ No policy in place

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**Resources**

✅ **Approved methodologies/regulations for planning and forecasting EMS personnel needs[2]**

NA/NR **Approved methodologies/regulations for planning and forecasting EMS vehicle needs[2]**

✅ **EMS vehicle staff requirements**
- ☐ Driver + 1 (1 EMT or Nurse)
- ☐ Driver + 2 (1 Basic EMT and 1 Advanced EMT)
- ☑ Driver + 2 (1 Physician and 1 Nurse or Paramedic)
- ☐ Driver + 3 (1 Physician, 1 Nurse, 1 Patient Transport Assistant)

## EMS Financing

NA/NR **EMS financing areas covered by regulations[2]**
- ☐ Healthcare funds allocation
- ☐ Coverage schemes
- ☐ Exemption policies
- ☐ Tariffs
- ☐ Fees for non-covered
- ☐ Contracting health services
- ☐ Reimbursement
- ☐ Stewardship and oversight of payer organization
- ☐ Incentivize providers for efficiency and quality care
- ☐ Provider control and audit

**Legal provisions regarding the mechanisms for allocating funds for EMS[2]**
- ☐ Ad-hoc based on current needs
- ☑ EMS budget (without specifications) for Ministries with responsibilities in the field of crisis
- ☐ Share from MoH budget

✅ **Emergency medical services provided to households and individuals free of charge**

NA/NR **Insurance schemes used for EMS**

- ☐ Government and/or MoH
- ☐ Private organizations
- ☐ Employers

**How the EMS is funded**
- ☑ MoH budget
- ☐ Separate government budget from MoH
- ☐ Private sector sources only
- ☐ User pays

---

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%
[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇨🇫 **Central African Republic**
**Survey completion[1]: 26% - Low**

## EMS Training

✅ **Accreditation of emergency medicine as a medical specialty**

NA/NR **Regulations requiring to complete an accredited EMS training program**

NA/NR **Existing register of EMS professionals at a local or national level**

NA/NR **Training in crisis and disaster management included in EM curriculum[2]**

**Institutions ensuring pre-service EMS education for specialties/professions**
- ☐ First-responders degree programs
- ☐ Technical schools and community colleges
- ☐ Medical colleges / Nurse Schools (medium education institutions)
- ☑ Medical Universities
- ☐ Public Health Schools
- ☑ Other institutions

## EMS Communications

**Public Access**

✅ **National Numbering Plan in force**

NA/NR **Single emergency number to access all emergency services**

✅ **Single emergency number or other emergency numbers free of charge**

NA/NR **Ability to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network**

**Other communication technologies used to contact EMS:**
NA/NR

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**Dispatch and Control**

**Category the PSAP can be attributed to**
- ☑ Referral - The PSAPs answer the phone, ask pertinent questions and then advise the calling party of the proper number to call
- ☑ Relay - The PSAP answers the phone, gets all necessary information and then relays the message to the appropriate agency
- ☐ Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call to the appropriate responding agency
- ☑ Direct - The PSAP answers the phone, gets all information from the caller, and then directly dispatches the necessary response units

NA/NR **Legal framework to regulate the activity of PSAPs and ECCs[2]**

**Type of communications technologies used at PSAP and ECC levels[2]**
- ☐ Land mobile radio systems (LMRS)
- ☐ Landline Telephone Systems
- ☑ Cellular Telephone Systems
- ☐ WIFI Systems
- ☐ IP Data Networks/Fiber Optic Connections
- ☐ Land Mobile Satellite Communications
- ☐ Other

NA/NR **PSAPs and ECCs equipped with a Computer Aided Dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)**

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**Interagency Communication**

**EMS financing areas covered by regulations:**
- ☐ PSAP – all public safety agencies (fire, police, EMS, etc.)
- ☐ Communication between all public safety agencies
- ☑ First Responder team to ambulance
- ☐ First Responder team to dispatch
- ☐ First Responder to medical control
- ☐ ECC/Medical control to ambulance
- ☐ Telemetry from ambulance
- ☑ Ambulance to dispatch      ☑ Hospital to hospital
- ☐ Ambulance to ambulance      ☐ Helicopter to dispatch
- ☑ Ambulance to hospital      ☐ Ambulance to helicopter
- ☑ Hospital ED to dispatch      ☐ Helicopter to hospital

NA/NR **Regulations in force regarding the utilization of frequencies reserved for "Emergency Medical"**

NA/NR **Minimum technical standards for EMS to hospital communication[2]**

NA/NR **Regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)[2]**

NA/NR **The EMS pathway include Medical Control**

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[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%

[2] Quality and comprehensiveness of regulations are not included

[3] NA/NR: Data not available or no response given

## References

**World Bank, The State of Emergency Medical Services (EMS) in Sub-Saharan Africa, 2021**

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🏳 Botswana
**Survey completion[1]: 55% - Medium**

## EMS Standards

### Governance

NA/NR **Right to care enshrined by Constitution or organic laws**

**Model/approaches to organize and regulate pre-hospital emergency care:**
- ☑ National system
- ☑ Local or regional systems
- ☑ Private systems
- ☑ Hospital-based systems
- ☐ Public service integrated with Civil Protection Authority
- ☐ Fire service and/or police
- ☐ Volunteer systems
- ☐ Hybrid systems

**Authority responsible for development of EMS policies and accountable for EMS system:**
Ministry of Health

**Leading authority in crisis/disaster response:**
NA/NR

**Legal requirement for EMS providers[2]**
- ☐ Accreditation
- ☑ Licensing
- ☐ Other types of authorization

NA/NR **EMS standards state that an inspection to be regularly carried out***

### Service Delivery

✗ **National level operational policies and protocols applicable to all authorized EMS providers[2], or**

✓ **Each EMS agency/provider have its own policies[2]**

✓ **Requirement to submit a copy of EMS patient report to patient at the time of transfer**

NA/NR **Mechanisms in place to measure and/or monitor patient satisfaction and/or patient experience**

**Out-of-hospital triage protocols followed:**
EMS provider protocols

NA/NR **Triage policy in transporting patients applied**
- ☐ Resource-Based START
- ☐ Non-conveyance
- ☐ Other (i.e. severity of patient's clinical condition)

NA/NR **Policy regarding which hospital the patient will be transported to for emergency care**
- ☐ Normative judgments: designated hospital catchment area
- ☐ Nearest emergency department with available beds
- ☐ Complex method: candidate Emergency Departments' available capacities
- ☐ Waiting times, and distances from the incident scene
- ☐ No policy in place

### Resources

NA/NR **Approved methodologies/regulations for planning and forecasting EMS personnel needs[2]**

NA/NR **Approved methodologies/regulations for planning and forecasting EMS vehicle needs[2]**

✓ **EMS vehicle staff requirements**
- ☐ Driver + 1 (1 EMT or Nurse)
- ☑ Driver + 2 (1 Basic EMT and 1 Advanced EMT)
- ☐ Driver + 2 (1 Physician and 1 Nurse or Paramedic)
- ☐ Driver + 3 (1 Physician, 1 Nurse, 1 Patient Transport Assistant)

## EMS Financing

NA/NR **EMS financing areas covered by regulations[2]**
- ☐ Healthcare funds allocation
- ☐ Coverage schemes
- ☐ Exemption policies
- ☐ Tariffs
- ☐ Fees for non-covered
- ☐ Contracting health services
- ☐ Reimbursement
- ☐ Stewardship and oversight of payer organization
- ☐ Incentivize providers for efficiency and quality care
- ☐ Provider control and audit

**Legal provisions regarding the mechanisms for allocating funds for EMS[2]**
- ☑ Ad-hoc based on current needs
- ☐ EMS budget (without specifications) for Ministries with responsibilities in the field of crisis
- ☐ Share from MoH budget

✓ **Emergency medical services provided to households and individuals free of charge**

✓ **Insurance schemes used for EMS**
Who provides the insurance schemes:
- ☑ Government and/or MoH
- ☑ Private organizations
- ☐ Employers

**How the EMS is funded**
- ☑ MoH budget
- ☐ Separate government budget from MoH
- ☐ Private sector sources only
- ☐ User pays

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%
[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇧🇼 **Botswana**

**Survey completion[1]: 55% - Medium**

## EMS Training

- ✅ **Accreditation of emergency medicine as a medical specialty**
- ✅ **Regulations requiring to complete an accredited EMS training program**
- ✅ **Existing register of EMS professionals at a local or national level**
- ✅ **Training in crisis and disaster management included in EM curriculum[2]**

**Institutions ensuring pre-service EMS education for specialties/professions**
- ☐ First-responders degree programs
- ☐ Technical schools and community colleges
- ☑ Medical colleges / Nurse Schools (medium education institutions)
- ☐ Medical Universities
- ☐ Public Health Schools
- ☐ Other institutions

## EMS Communications

**Public Access**

- ✅ **National Numbering Plan in force**
- NA/NR **Single emergency number to access all emergency services**
- ✅ **Single emergency number or other emergency numbers free of charge**

- NA/NR **Ability to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network**

**Other communication technologies used to contact EMS:**
NA/NR

**Dispatch and Control**

**Category the PSAP can be attributed to**
- ☐ Referral - The PSAPs answer the phone, ask pertinent questions and then advise the calling party of the proper number to call
- ☐ Relay - The PSAP answers the phone, gets all necessary information and then relays the message to the appropriate agency
- ☐ Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call to the appropriate responding agency
- ☑ Direct - The PSAP answers the phone, gets all information from the caller, and then directly dispatches the necessary response units

- ✅ **Legal framework to regulate the activity of PSAPs and ECCs[2]**

- NA/NR **Type of communications technologies used at PSAP and ECC levels[2]**
  - ☐ Land mobile radio systems (LMRS)
  - ☐ Landline Telephone Systems
  - ☐ Cellular Telephone Systems
  - ☐ WIFI Systems
  - ☐ IP Data Networks/Fiber Optic Connections
  - ☐ Land Mobile Satellite Communications
  - ☐ Other

- NA/NR **PSAPs and ECCs equipped with a Computer Aided Dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)**

**Interagency Communication**

- NA/NR **EMS financing areas covered by regulations:**
  - ☐ PSAP – all public safety agencies (fire, police, EMS, etc.)
  - ☐ Communication between all public safety agencies
  - ☐ First Responder team to ambulance
  - ☐ First Responder team to dispatch
  - ☐ First Responder to medical control
  - ☐ ECC/Medical control to ambulance
  - ☐ Telemetry from ambulance
  - ☐ Ambulance to dispatch      ☐ Hospital to hospital
  - ☐ Ambulance to ambulance     ☐ Helicopter to dispatch
  - ☐ Ambulance to hospital      ☐ Ambulance to helicopter
  - ☐ Hospital ED to dispatch    ☐ Helicopter to hospital

- NA/NR **Regulations in force regarding the utilization of frequencies reserved for "Emergency Medical"**

- NA/NR **Minimum technical standards for EMS to hospital communication[2]**

- ✅ **Regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)[2]**

- NA/NR **The EMS pathway include Medical Control**

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%

[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

## References

World Bank, The State of Emergency Medical Services (EMS) in Sub-Saharan Africa, 2021

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇨🇲 Cameroon

**Survey completion[1]: 37% - Medium**

## EMS Standards

**Governance**

NA/NR **Right to care enshrined by Constitution or organic laws**

**Model/approaches to organize and regulate pre-hospital emergency care:**
- ☑ National system
- ☑ Local or regional systems
- ☐ Private systems
- ☐ Hospital-based systems
- ☐ Public service integrated with Civil Protection Authority
- ☐ Fire service and/or police
- ☐ Volunteer systems
- ☐ Hybrid systems

**Authority responsible for development of EMS policies and accountable for EMS system:**
EMS Center

**Leading authority in crisis/disaster response:**
Ministry of Territorial (Local) Administration

**Legal requirement for EMS providers[2]**
- ☐ Accreditation
- ☐ Licensing
- ☑ Other types of authorization

✅ **EMS standards state that an inspection to be regularly carried out***

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**Service Delivery**

NA/NR **National level operational policies and protocols applicable to all authorized EMS providers[2], or**

NA/NR **Each EMS agency/provider have its own policies[2]**

NA/NR **Requirement to submit a copy of EMS patient report to patient at the time of transfer**

NA/NR **Mechanisms in place to measure and/or monitor patient satisfaction and/or patient experience**

**Out-of-hospital triage protocols followed:**
NA/NR

NA/NR **Triage policy in transporting patients applied**
- ☐ Resource-Based START
- ☐ Non-conveyance
- ☐ Other (i.e. severity of patient's clinical condition)

**Policy regarding which hospital the patient will be transported to for emergency care**
- ☐ Normative judgments: designated hospital catchment area
- ☑ Nearest emergency department with available beds
- ☑ Complex method: candidate Emergency Departments' available capacities
- ☑ Waiting times, and distances from the incident scene
- ☐ No policy in place

---

**Resources**

✅ **Approved methodologies/regulations for planning and forecasting EMS personnel needs[2]**

NA/NR **Approved methodologies/regulations for planning and forecasting EMS vehicle needs[2]**

✅ **EMS vehicle staff requirements**
- ☐ Driver + 1 (1 EMT or Nurse)
- ☐ Driver + 2 (1 Basic EMT and 1 Advanced EMT)
- ☑ Driver + 2 (1 Physician and 1 Nurse or Paramedic)
- ☐ Driver + 3 (1 Physician, 1 Nurse, 1 Patient Transport Assistant)

## EMS Financing

NA/NR **EMS financing areas covered by regulations[2]**
- ☐ Healthcare funds allocation
- ☐ Coverage schemes
- ☐ Exemption policies
- ☐ Tariffs
- ☐ Fees for non-covered
- ☐ Contracting health services
- ☐ Reimbursement
- ☐ Stewardship and oversight of payer organization
- ☐ Incentivize providers for efficiency and quality care
- ☐ Provider control and audit

NA/NR **Legal provisions regarding the mechanisms for allocating funds for EMS[2]**
- ☐ Ad-hoc based on current needs
- ☐ EMS budget (without specifications) for Ministries with responsibilities in the field of crisis
- ☐ Share from MoH budget

NA/NR **Emergency medical services provided to households and individuals free of charge**

NA/NR **Insurance schemes used for EMS**
- ☐ Government and/or MoH
- ☐ Private organizations
- ☐ Employers

**How the EMS is funded**
- ☑ MoH budget
- ☑ Separate government budget from MoH
- ☑ Private sector sources only
- ☑ User pays

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%
[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇨🇲 **Cameroon**

**Survey completion[1]: 37% - Medium**

## EMS Training

✗ **Accreditation of emergency medicine as a medical specialty**

NA/NR **Regulations requiring to complete an accredited EMS training program**

NA/NR **Existing register of EMS professionals at a local or national level**

NA/NR **Training in crisis and disaster management included in EM curriculum[2]**

**Institutions ensuring pre-service EMS education for specialties/professions**
- ☐ First-responders degree programs
- ☐ Technical schools and community colleges
- ☑ Medical colleges / Nurse Schools (medium education institutions)
- ☑ Medical Universities
- ☐ Public Health Schools
- ☐ Other institutions

## EMS Communications

### Public Access

✅ **National Numbering Plan in force**

NA/NR **Single emergency number to access all emergency services**

✅ **Single emergency number or other emergency numbers free of charge**

NA/NR **Ability to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network**

**Other communication technologies used to contact EMS:**
NA/NR

### Dispatch and Control

NA/NR **Category the PSAP can be attributed to**
- ☐ Referral - The PSAPs answer the phone, ask pertinent questions and then advise the calling party of the proper number to call
- ☐ Relay - The PSAP answers the phone, gets all necessary information and then relays the message to the appropriate agency
- ☐ Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call to the appropriate responding agency
- ☐ Direct - The PSAP answers the phone, gets all information from the caller, and then directly dispatches the necessary response units

NA/NR **Legal framework to regulate the activity of PSAPs and ECCs[2]**

NA/NR **Type of communications technologies used at PSAP and ECC levels[2]**
- ☐ Land mobile radio systems (LMRS)
- ☐ Landline Telephone Systems
- ☐ Cellular Telephone Systems
- ☐ WIFI Systems
- ☐ IP Data Networks/Fiber Optic Connections
- ☐ Land Mobile Satellite Communications
- ☐ Other

NA/NR **PSAPs and ECCs equipped with a Computer Aided Dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)**

### Interagency Communication

NA/NR **EMS financing areas covered by regulations:**
- ☐ PSAP – all public safety agencies (fire, police, EMS, etc.)
- ☐ Communication between all public safety agencies
- ☐ First Responder team to ambulance
- ☐ First Responder team to dispatch
- ☐ First Responder to medical control
- ☐ ECC/Medical control to ambulance
- ☐ Telemetry from ambulance
- ☐ Ambulance to dispatch
- ☐ Ambulance to ambulance
- ☐ Ambulance to hospital
- ☐ Hospital ED to dispatch
- ☐ Hospital to hospital
- ☐ Helicopter to dispatch
- ☐ Ambulance to helicopter
- ☐ Helicopter to hospital

NA/NR **Regulations in force regarding the utilization of frequencies reserved for "Emergency Medical"**

NA/NR **Minimum technical standards for EMS to hospital communication[2]**

NA/NR **Regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)[2]**

NA/NR **The EMS pathway include Medical Control**

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%

[2] Quality and comprehensiveness of regulations are not included

[3] NA/NR: Data not available or no response given

## References

World Bank, The State of Emergency Medical Services (EMS) in Sub-Saharan Africa, 2021

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇷🇴 Chad

**Survey completion¹: 18% - Low**

## EMS Standards

### Governance

✅ **Right to care enshrined by Constitution or organic laws**

**Model/approaches to organize and regulate pre-hospital emergency care:**
- ☐ National system
- ☐ Local or regional systems
- ☐ Private systems
- ☑ Hospital-based systems
- ☐ Public service integrated with Civil Protection Authority
- ☐ Fire service and/or police
- ☐ Volunteer systems
- ☐ Hybrid systems

**Authority responsible for development of EMS policies and accountable for EMS system:**
Ministry of Health

**Leading authority in crisis/disaster response:**
NA/NR

NA/NR **Legal requirement for EMS providers²**
- ☐ Accreditation     ☐ Licensing
- ☐ Other types of authorization

NA/NR **EMS standards state that an inspection to be regularly carried out***

### Service Delivery

NA/NR **National level operational policies and protocols applicable to all authorized EMS providers², or**

NA/NR **Each EMS agency/provider have its own policies²**

NA/NR **Requirement to submit a copy of EMS patient report to patient at the time of transfer**

✅ **Mechanisms in place to measure and/or monitor patient satisfaction and/or patient experience**

**Out-of-hospital triage protocols followed:**
NA/NR

NA/NR **Triage policy in transporting patients applied**
- ☐ Resource-Based START
- ☐ Non-conveyance
- ☐ Other (i.e. severity of patient's clinical condition)

**Policy regarding which hospital the patient will be transported to for emergency care**
- ☐ Normative judgments: designated hospital catchment area
- ☑ Nearest emergency department with available beds
- ☐ Complex method: candidate Emergency Departments' available capacities
- ☑ Waiting times, and distances from the incident scene
- ☐ No policy in place

### Resources

NA/NR **Approved methodologies/regulations for planning and forecasting EMS personnel needs²**

NA/NR **Approved methodologies/regulations for planning and forecasting EMS vehicle needs²**

❌ **EMS vehicle staff requirements**
- ☐ Driver + 1 (1 EMT or Nurse)
- ☐ Driver + 2 (1 Basic EMT and 1 Advanced EMT)
- ☐ Driver + 2 (1 Physician and 1 Nurse or Paramedic)
- ☐ Driver + 3 (1 Physician, 1 Nurse, 1 Patient Transport Assistant)

## EMS Financing

NA/NR **EMS financing areas covered by regulations²**
- ☐ Healthcare funds allocation
- ☐ Coverage schemes
- ☐ Exemption policies
- ☐ Tariffs
- ☐ Fees for non-covered
- ☐ Contracting health services
- ☐ Reimbursement
- ☐ Stewardship and oversight of payer organization
- ☐ Incentivize providers for efficiency and quality care
- ☐ Provider control and audit

NA/NR **Legal provisions regarding the mechanisms for allocating funds for EMS²**
- ☐ Ad-hoc based on current needs
- ☐ EMS budget (without specifications) for Ministries with responsibilities in the field of crisis
- ☐ Share from MoH budget

NA/NR **Emergency medical services provided to households and individuals free of charge**

NA/NR **Insurance schemes used for EMS**
- ☐ Government and/or MoH
- ☐ Private organizations
- ☐ Employers

NA/NR **How the EMS is funded**
- ☐ MoH budget
- ☐ Separate government budget from MoH
- ☐ Private sector sources only
- ☐ User pays

¹ Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%
² Quality and comprehensiveness of regulations are not included
³ NA/NR: Data not available or no response given

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇹🇩 Chad

**Survey completion[1]: 18% - Low**

## EMS Training

✓ **Accreditation of emergency medicine as a medical specialty**

NA/NR **Regulations requiring to complete an accredited EMS training program**

NA/NR **Existing register of EMS professionals at a local or national level**

✓ **Training in crisis and disaster management included in EM curriculum[2]**

NA/NR **Institutions ensuring pre-service EMS education for specialties/professions**
- ☐ First-responders degree programs
- ☐ Technical schools and community colleges
- ☐ Medical colleges / Nurse Schools (medium education institutions)
- ☐ Medical Universities
- ☐ Public Health Schools
- ☐ Other institutions

## EMS Communications

### Public Access

✓ **National Numbering Plan in force**

NA/NR **Single emergency number to access all emergency services**

✓ **Single emergency number or other emergency numbers free of charge**

NA/NR **Ability to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network**

**Other communication technologies used to contact EMS:**
NA/NR

### Dispatch and Control

NA/NR **Category the PSAP can be attributed to**
- ☐ Referral - The PSAPs answer the phone, ask pertinent questions and then advise the calling party of the proper number to call
- ☐ Relay - The PSAP answers the phone, gets all necessary information and then relays the message to the appropriate agency
- ☐ Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call to the appropriate responding agency
- ☐ Direct - The PSAP answers the phone, gets all information from the caller, and then directly dispatches the necessary response units

NA/NR **Legal framework to regulate the activity of PSAPs and ECCs[2]**

NA/NR **Type of communications technologies used at PSAP and ECC levels[2]**
- ☐ Land mobile radio systems (LMRS)
- ☐ Landline Telephone Systems
- ☐ Cellular Telephone Systems
- ☐ WIFI Systems
- ☐ IP Data Networks/Fiber Optic Connections
- ☐ Land Mobile Satellite Communications
- ☐ Other

NA/NR **PSAPs and ECCs equipped with a Computer Aided Dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)**

### Interagency Communication

NA/NR **EMS financing areas covered by regulations:**
- ☐ PSAP – all public safety agencies (fire, police, EMS, etc.)
- ☐ Communication between all public safety agencies
- ☐ First Responder team to ambulance
- ☐ First Responder team to dispatch
- ☐ First Responder to medical control
- ☐ ECC/Medical control to ambulance
- ☐ Telemetry from ambulance
- ☐ Ambulance to dispatch
- ☐ Ambulance to ambulance
- ☐ Ambulance to hospital
- ☐ Hospital ED to dispatch
- ☐ Hospital to hospital
- ☐ Helicopter to dispatch
- ☐ Ambulance to helicopter
- ☐ Helicopter to hospital

NA/NR **Regulations in force regarding the utilization of frequencies reserved for "Emergency Medical"**

NA/NR **Minimum technical standards for EMS to hospital communication[2]**

✓ **Regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)[2]**

NA/NR **The EMS pathway include Medical Control**

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[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%

[2] Quality and comprehensiveness of regulations are not included

[3] NA/NR: Data not available or no response given

## References

World Bank, The State of Emergency Medical Services (EMS) in Sub-Saharan Africa, 2021

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇨🇩 Congo Brazzaville

**Survey completion[1]: 32% - Medium**

## EMS Standards

✅ **Right to care enshrined by Constitution or organic laws**

**Model/approaches to organize and regulate pre-hospital emergency care:**
- ☑ National system
- ☐ Local or regional systems
- ☐ Private systems
- ☐ Hospital-based systems
- ☑ Public service integrated with Civil Protection Authority
- ☑ Fire service and/or police
- ☐ Volunteer systems
- ☐ Hybrid systems

**Authority responsible for development of EMS policies and accountable for EMS system:**
Ministry of Health

**Leading authority in crisis/disaster response:**
Prefect (Local Public Authority)

**Legal requirement for EMS providers[2]**
- ☐ Accreditation
- ☐ Licensing
- ☑ Other types of authorization

NA/NR **EMS standards state that an inspection to be regularly carried out***

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✅ **National level operational policies and protocols applicable to all authorized EMS providers[2], or**

❌ **Each EMS agency/provider have its own policies[2]**

✅ **Requirement to submit a copy of EMS patient report to patient at the time of transfer**

NA/NR **Mechanisms in place to measure and/or monitor patient satisfaction and/or patient experience**

**Out-of-hospital triage protocols followed:**
NA/NR

**Triage policy in transporting patients applied**
- ☐ Resource-Based START
- ☐ Non-conveyance
- ☑ Other (i.e. severity of patient's clinical condition)

**Policy regarding which hospital the patient will be transported to for emergency care**
- ☐ Normative judgments: designated hospital catchment area
- ☑ Nearest emergency department with available beds
- ☑ Complex method: candidate Emergency Departments' available capacities
- ☑ Waiting times, and distances from the incident scene
- ☐ No policy in place

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NA/NR **Approved methodologies/regulations for planning and forecasting EMS personnel needs[2]**

NA/NR **Approved methodologies/regulations for planning and forecasting EMS vehicle needs[2]**

❌ **EMS vehicle staff requirements**
- ☐ Driver + 1 (1 EMT or Nurse)
- ☐ Driver + 2 (1 Basic EMT and 1 Advanced EMT)
- ☐ Driver + 2 (1 Physician and 1 Nurse or Paramedic)
- ☐ Driver + 3 (1 Physician, 1 Nurse, 1 Patient Transport Assistant)

*(Governance — Service Delivery — Resources)*

## EMS Financing

NA/NR **EMS financing areas covered by regulations[2]**
- ☐ Healthcare funds allocation
- ☐ Coverage schemes
- ☐ Exemption policies
- ☐ Tariffs
- ☐ Fees for non-covered
- ☐ Contracting health services
- ☐ Reimbursement
- ☐ Stewardship and oversight of payer organization
- ☐ Incentivize providers for efficiency and quality care
- ☐ Provider control and audit

NA/NR **Legal provisions regarding the mechanisms for allocating funds for EMS[2]**
- ☐ Ad-hoc based on current needs
- ☐ EMS budget (without specifications) for Ministries with responsibilities in the field of crisis
- ☐ Share from MoH budget

✅ **Emergency medical services provided to households and individuals free of charge**

NA/NR **Insurance schemes used for EMS**
- ☐ Government and/or MoH
- ☐ Private organizations
- ☐ Employers

**How the EMS is funded**
- ☐ MoH budget
- ☑ Separate government budget from MoH
- ☐ Private sector sources only
- ☐ User pays

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%
[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** Congo Brazzaville
**Survey completion¹: 32% - Medium**

## EMS Training

✗ **Accreditation of emergency medicine as a medical specialty**

NA/NR **Regulations requiring to complete an accredited EMS training program**

NA/NR **Existing register of EMS professionals at a local or national level**

NA/NR **Training in crisis and disaster management included in EM curriculum²**

**Institutions ensuring pre-service EMS education for specialties/professions**
- ☐ First-responders degree programs
- ☐ Technical schools and community colleges
- ☑ Medical colleges / Nurse Schools (medium education institutions)
- ☑ Medical Universities
- ☐ Public Health Schools
- ☑ Other institutions

## EMS Communications

**Public Access**

✅ **National Numbering Plan in force**

NA/NR **Single emergency number to access all emergency services**

✅ **Single emergency number or other emergency numbers free of charge**

NA/NR **Ability to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network**

**Other communication technologies used to contact EMS:**
NA/NR

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**Dispatch and Control**

NA/NR **Category the PSAP can be attributed to**
- ☐ Referral - The PSAPs answer the phone, ask pertinent questions and then advise the calling party of the proper number to call
- ☐ Relay - The PSAP answers the phone, gets all necessary information and then relays the message to the appropriate agency
- ☐ Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call to the appropriate responding agency
- ☐ Direct - The PSAP answers the phone, gets all information from the caller, and then directly dispatches the necessary response units

NA/NR **Legal framework to regulate the activity of PSAPs and ECCs²**

NA/NR **Type of communications technologies used at PSAP and ECC levels²**
- ☐ Land mobile radio systems (LMRS)
- ☐ Landline Telephone Systems
- ☐ Cellular Telephone Systems
- ☐ WIFI Systems
- ☐ IP Data Networks/Fiber Optic Connections
- ☐ Land Mobile Satellite Communications
- ☐ Other

NA/NR **PSAPs and ECCs equipped with a Computer Aided Dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)**

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**Interagency Communication**

NA/NR **EMS financing areas covered by regulations:**
- ☐ PSAP – all public safety agencies (fire, police, EMS, etc.)
- ☐ Communication between all public safety agencies
- ☐ First Responder team to ambulance
- ☐ First Responder team to dispatch
- ☐ First Responder to medical control
- ☐ ECC/Medical control to ambulance
- ☐ Telemetry from ambulance
- ☐ Ambulance to dispatch
- ☐ Ambulance to ambulance
- ☐ Ambulance to hospital
- ☐ Hospital ED to dispatch
- ☐ Hospital to hospital
- ☐ Helicopter to dispatch
- ☐ Ambulance to helicopter
- ☐ Helicopter to hospital

NA/NR **Regulations in force regarding the utilization of frequencies reserved for "Emergency Medical"**

NA/NR **Minimum technical standards for EMS to hospital communication²**

NA/NR **Regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)²**

NA/NR **The EMS pathway include Medical Control**

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¹ Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%

² Quality and comprehensiveness of regulations are not included

³ NA/NR: Data not available or no response given

## References

World Bank, The State of Emergency Medical Services (EMS) in Sub-Saharan Africa, 2021

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** Comoros

**Survey completion[1]: 30% - Medium**

## EMS Standards

### Governance

✅ **Right to care enshrined by Constitution or organic laws**

**Model/approaches to organize and regulate pre-hospital emergency care:**
- ☑ National system
- ☑ Local or regional systems
- ☐ Private systems
- ☑ Hospital-based systems
- ☐ Public service integrated with Civil Protection Authority
- ☐ Fire service and/or police
- ☐ Volunteer systems
- ☐ Hybrid systems

**Authority responsible for development of EMS policies and accountable for EMS system:**
Ministry of Health

**Leading authority in crisis/disaster response:**
Civil Protection Authority (MoIA)

**Legal requirement for EMS providers[2]**
- ☐ Accreditation
- ☐ Licensing
- ☑ Other types of authorization

✅ **EMS standards state that an inspection to be regularly carried out***

### Service Delivery

NA/NR **National level operational policies and protocols applicable to all authorized EMS providers[2], or**

NA/NR **Each EMS agency/provider have its own policies[2]**

NA/NR **Requirement to submit a copy of EMS patient report to patient at the time of transfer**

NA/NR **Mechanisms in place to measure and/or monitor patient satisfaction and/or patient experience**

**Out-of-hospital triage protocols followed:**
NA/NR

NA/NR **Triage policy in transporting patients applied**
- ☐ Resource-Based START
- ☐ Non-conveyance
- ☐ Other (i.e. severity of patient's clinical condition)

**Policy regarding which hospital the patient will be transported to for emergency care**
- ☐ Normative judgments: designated hospital catchment area
- ☑ Nearest emergency department with available beds
- ☐ Complex method: candidate Emergency Departments' available capacities
- ☐ Waiting times, and distances from the incident scene
- ☐ No policy in place

### Resources

NA/NR **Approved methodologies/regulations for planning and forecasting EMS personnel needs[2]**

NA/NR **Approved methodologies/regulations for planning and forecasting EMS vehicle needs[2]**

NA/NR **EMS vehicle staff requirements**
- ☐ Driver + 1 (1 EMT or Nurse)
- ☐ Driver + 2 (1 Basic EMT and 1 Advanced EMT)
- ☐ Driver + 2 (1 Physician and 1 Nurse or Paramedic)
- ☐ Driver + 3 (1 Physician, 1 Nurse, 1 Patient Transport Assistant)

## EMS Financing

**EMS financing areas covered by regulations[2]**
- ☑ Healthcare funds allocation
- ☑ Coverage schemes
- ☐ Exemption policies
- ☐ Tariffs
- ☐ Fees for non-covered
- ☑ Contracting health services
- ☐ Reimbursement
- ☐ Stewardship and oversight of payer organization
- ☐ Incentivize providers for efficiency and quality care
- ☐ Provider control and audit

**Legal provisions regarding the mechanisms for allocating funds for EMS[2]**
- ☐ Ad-hoc based on current needs
- ☐ EMS budget (without specifications) for Ministries with responsibilities in the field of crisis
- ☑ Share from MoH budget

✅ **Emergency medical services provided to households and individuals free of charge**

✅ **Insurance schemes used for EMS**
Who provides the insurance schemes:
- ☑ Government and/or MoH
- ☑ Private organizations
- ☐ Employers

**How the EMS is funded**
- ☑ MoH budget
- ☑ Separate government budget from MoH
- ☑ Private sector sources only
- ☑ User pays

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%
[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇰🇲 **Comoros**
**Survey completion[1]: 30% - Medium**

## EMS Training

✗ **Accreditation of emergency medicine as a medical specialty**

NA/NR **Regulations requiring to complete an accredited EMS training program**

NA/NR **Existing register of EMS professionals at a local or national level**

NA/NR **Training in crisis and disaster management included in EM curriculum[2]**

NA/NR **Institutions ensuring pre-service EMS education for specialties/professions**
- ☐ First-responders degree programs
- ☐ Technical schools and community colleges
- ☐ Medical colleges / Nurse Schools (medium education institutions)
- ☐ Medical Universities
- ☐ Public Health Schools
- ☐ Other institutions

## EMS Communications

**Public Access**

✅ **National Numbering Plan in force**

NA/NR **Single emergency number to access all emergency services**

✅ **Single emergency number or other emergency numbers free of charge**

NA/NR **Ability to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network**

**Other communication technologies used to contact EMS:**
NA/NR

**Dispatch and Control**

NA/NR **Category the PSAP can be attributed to**
- ☐ Referral - The PSAPs answer the phone, ask pertinent questions and then advise the calling party of the proper number to call
- ☐ Relay - The PSAP answers the phone, gets all necessary information and then relays the message to the appropriate agency
- ☐ Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call to the appropriate responding agency
- ☐ Direct - The PSAP answers the phone, gets all information from the caller, and then directly dispatches the necessary response units

NA/NR **Legal framework to regulate the activity of PSAPs and ECCs[2]**

**Type of communications technologies used at PSAP and ECC levels[2]**
- ☐ Land mobile radio systems (LMRS)
- ☑ Landline Telephone Systems
- ☑ Cellular Telephone Systems
- ☐ WIFI Systems
- ☐ IP Data Networks/Fiber Optic Connections
- ☐ Land Mobile Satellite Communications
- ☐ Other

NA/NR **PSAPs and ECCs equipped with a Computer Aided Dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)**

**Interagency Communication**

NA/NR **EMS financing areas covered by regulations:**
- ☐ PSAP – all public safety agencies (fire, police, EMS, etc.)
- ☐ Communication between all public safety agencies
- ☐ First Responder team to ambulance
- ☐ First Responder team to dispatch
- ☐ First Responder to medical control
- ☐ ECC/Medical control to ambulance
- ☐ Telemetry from ambulance
- ☐ Ambulance to dispatch
- ☐ Ambulance to ambulance
- ☐ Ambulance to hospital
- ☐ Hospital ED to dispatch
- ☐ Hospital to hospital
- ☐ Helicopter to dispatch
- ☐ Ambulance to helicopter
- ☐ Helicopter to hospital

NA/NR **Regulations in force regarding the utilization of frequencies reserved for "Emergency Medical"**

NA/NR **Minimum technical standards for EMS to hospital communication[2]**

NA/NR **Regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)[2]**

NA/NR **The EMS pathway include Medical Control**

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[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%

[2] Quality and comprehensiveness of regulations are not included

[3] NA/NR: Data not available or no response given

## References

**World Bank, The State of Emergency Medical Services (EMS) in Sub-Saharan Africa, 2021**

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇨🇻 Cape Verde
**Survey completion[1]: 11% - Low**

## EMS Standards

*Governance*

✅ **Right to care enshrined by Constitution or organic laws**

**Model/approaches to organize and regulate pre-hospital emergency care:**
- ☑ National system
- ☐ Local or regional systems
- ☐ Private systems
- ☐ Hospital-based systems
- ☐ Public service integrated with Civil Protection Authority
- ☐ Fire service and/or police
- ☐ Volunteer systems
- ☐ Hybrid systems

**Authority responsible for development of EMS policies and accountable for EMS system:**
NA/NR

**Leading authority in crisis/disaster response:**
NA/NR

NA/NR **Legal requirement for EMS providers[2]**
- ☐ Accreditation      ☐ Licensing
- ☐ Other types of authorization

NA/NR **EMS standards state that an inspection to be regularly carried out***

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*Service Delivery*

NA/NR **National level operational policies and protocols applicable to all authorized EMS providers[2], or**

NA/NR **Each EMS agency/provider have its own policies[2]**

NA/NR **Requirement to submit a copy of EMS patient report to patient at the time of transfer**

NA/NR **Mechanisms in place to measure and/or monitor patient satisfaction and/or patient experience**

**Out-of-hospital triage protocols followed:**
NA/NR

NA/NR **Triage policy in transporting patients applied**
- ☐ Resource-Based START
- ☐ Non-conveyance
- ☐ Other (i.e. severity of patient's clinical condition)

NA/NR **Policy regarding which hospital the patient will be transported to for emergency care**
- ☐ Normative judgments: designated hospital catchment area
- ☐ Nearest emergency department with available beds
- ☐ Complex method: candidate Emergency Departments' available capacities
- ☐ Waiting times, and distances from the incident scene
- ☐ No policy in place

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*Resources*

NA/NR **Approved methodologies/regulations for planning and forecasting EMS personnel needs[2]**

NA/NR **Approved methodologies/regulations for planning and forecasting EMS vehicle needs[2]**

NA/NR **EMS vehicle staff requirements**
- ☐ Driver + 1 (1 EMT or Nurse)
- ☐ Driver + 2 (1 Basic EMT and 1 Advanced EMT)
- ☐ Driver + 2 (1 Physician and 1 Nurse or Paramedic)
- ☐ Driver + 3 (1 Physician, 1 Nurse, 1 Patient Transport Assistant)

## EMS Financing

NA/NR **EMS financing areas covered by regulations[2]**
- ☐ Healthcare funds allocation
- ☐ Coverage schemes
- ☐ Exemption policies
- ☐ Tariffs
- ☐ Fees for non-covered
- ☐ Contracting health services
- ☐ Reimbursement
- ☐ Stewardship and oversight of payer organization
- ☐ Incentivize providers for efficiency and quality care
- ☐ Provider control and audit

NA/NR **Legal provisions regarding the mechanisms for allocating funds for EMS[2]**
- ☐ Ad-hoc based on current needs
- ☐ EMS budget (without specifications) for Ministries with responsibilities in the field of crisis
- ☐ Share from MoH budget

NA/NR **Emergency medical services provided to households and individuals free of charge**

NA/NR **Insurance schemes used for EMS**

- ☐ Government and/or MoH
- ☐ Private organizations
- ☐ Employers

NA/NR **How the EMS is funded**
- ☐ MoH budget
- ☐ Separate government budget from MoH
- ☐ Private sector sources only
- ☐ User pays

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%
[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** Cape Verde

**Survey completion[1]: 11% - Low**

## EMS Training

✗ **Accreditation of emergency medicine as a medical specialty**

NA/NR **Regulations requiring to complete an accredited EMS training program**

NA/NR **Existing register of EMS professionals at a local or national level**

NA/NR **Training in crisis and disaster management included in EM curriculum[2]**

**Institutions ensuring pre-service EMS education for specialties/professions**
- ☐ First-responders degree programs
- ☐ Technical schools and community colleges
- ☐ Medical colleges / Nurse Schools (medium education institutions)
- ☑ Medical Universities
- ☐ Public Health Schools
- ☐ Other institutions

## EMS Communications

**Public Access**

✓ **National Numbering Plan in force**

NA/NR **Single emergency number to access all emergency services**

✓ **Single emergency number or other emergency numbers free of charge**

NA/NR **Ability to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network**

**Other communication technologies used to contact EMS:**
NA/NR

**Dispatch and Control**

**Category the PSAP can be attributed to**
- ☐ Referral - The PSAPs answer the phone, ask pertinent questions and then advise the calling party of the proper number to call
- ☐ Relay - The PSAP answers the phone, gets all necessary information and then relays the message to the appropriate agency
- ☑ Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call to the appropriate responding agency
- ☑ Direct - The PSAP answers the phone, gets all information from the caller, and then directly dispatches the necessary response units

**Type of communications technologies used at PSAP and ECC levels[2]**
- ☐ Land mobile radio systems (LMRS)
- ☐ Landline Telephone Systems
- ☑ Cellular Telephone Systems
- ☐ WIFI Systems
- ☐ IP Data Networks/Fiber Optic Connections
- ☐ Land Mobile Satellite Communications
- ☐ Other

NA/NR **Legal framework to regulate the activity of PSAPs and ECCs[2]**

NA/NR **PSAPs and ECCs equipped with a Computer Aided Dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)**

**Interagency Communication**

**EMS financing areas covered by regulations:**
- ☐ PSAP – all public safety agencies (fire, police, EMS, etc.)
- ☑ Communication between all public safety agencies
- ☑ First Responder team to ambulance
- ☐ First Responder team to dispatch
- ☐ First Responder to medical control
- ☐ ECC/Medical control to ambulance
- ☐ Telemetry from ambulance
- ☐ Ambulance to dispatch
- ☐ Ambulance to ambulance
- ☑ Ambulance to hospital
- ☐ Hospital ED to dispatch
- ☐ Hospital to hospital
- ☐ Helicopter to dispatch
- ☐ Ambulance to helicopter
- ☐ Helicopter to hospital

NA/NR **Regulations in force regarding the utilization of frequencies reserved for "Emergency Medical"**

NA/NR **Minimum technical standards for EMS to hospital communication[2]**

NA/NR **Regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)[2]**

NA/NR **The EMS pathway include Medical Control**

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%

[2] Quality and comprehensiveness of regulations are not included

[3] NA/NR: Data not available or no response given

## References

World Bank, The State of Emergency Medical Services (EMS) in Sub-Saharan Africa, 2021

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** Gabon

**Survey completion[1]: 13% - Low**

## EMS Standards

✓ **Right to care enshrined by Constitution or organic laws**

**Model/approaches to organize and regulate pre-hospital emergency care:**
- ☑ National system
- ☐ Local or regional systems
- ☐ Private systems
- ☐ Hospital-based systems
- ☐ Public service integrated with Civil Protection Authority
- ☐ Fire service and/or police
- ☐ Volunteer systems
- ☐ Hybrid systems

**Authority responsible for development of EMS policies and accountable for EMS system:**
NA/NR

**Leading authority in crisis/disaster response:**
NA/NR

**NA/NR Legal requirement for EMS providers[2]**
- ☐ Accreditation          ☐ Licensing
- ☐ Other types of authorization

**NA/NR EMS standards state that an inspection to be regularly carried out***

**NA/NR National level operational policies and protocols applicable to all authorized EMS providers[2], or**

**NA/NR Each EMS agency/provider have its own policies[2]**

**NA/NR Requirement to submit a copy of EMS patient report to patient at the time of transfer**

**NA/NR Mechanisms in place to measure and/or monitor patient satisfaction and/or patient experience**

**Out-of-hospital triage protocols followed:**
EMS provider protocols

**NA/NR Triage policy in transporting patients applied**
- ☐ Resource-Based START
- ☐ Non-conveyance
- ☐ Other (i.e. severity of patient's clinical condition)

**NA/NR Policy regarding which hospital the patient will be transported to for emergency care**
- ☐ Normative judgments: designated hospital catchment area
- ☐ Nearest emergency department with available beds
- ☐ Complex method: candidate Emergency Departments' available capacities
- ☐ Waiting times, and distances from the incident scene
- ☐ No policy in place

**NA/NR Approved methodologies/regulations for planning and forecasting EMS personnel needs[2]**

**NA/NR Approved methodologies/regulations for planning and forecasting EMS vehicle needs[2]**

**NA/NR EMS vehicle staff requirements**
- ☐ Driver + 1 (1 EMT or Nurse)
- ☐ Driver + 2 (1 Basic EMT and 1 Advanced EMT)
- ☐ Driver + 2 (1 Physician and 1 Nurse or Paramedic)
- ☐ Driver + 3 (1 Physician, 1 Nurse, 1 Patient Transport Assistant)

*Governance*

*Service Delivery*

*Resources*

## EMS Financing

**NA/NR EMS financing areas covered by regulations[2]**
- ☐ Healthcare funds allocation
- ☐ Coverage schemes
- ☐ Exemption policies
- ☐ Tariffs
- ☐ Fees for non-covered
- ☐ Contracting health services
- ☐ Reimbursement
- ☐ Stewardship and oversight of payer organization
- ☐ Incentivize providers for efficiency and quality care
- ☐ Provider control and audit

**Legal provisions regarding the mechanisms for allocating funds for EMS[2]**
- ☐ Ad-hoc based on current needs
- ☐ EMS budget (without specifications) for Ministries with responsibilities in the field of crisis
- ☑ Share from MoH budget

**NA/NR Emergency medical services provided to households and individuals free of charge**

**NA/NR Insurance schemes used for EMS**

- ☐ Government and/or MoH
- ☐ Private organizations
- ☐ Employers

**NA/NR How the EMS is funded**
- ☐ MoH budget
- ☐ Separate government budget from MoH
- ☐ Private sector sources only
- ☐ User pays

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%
[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇬🇦 Gabon

**Survey completion[1]: 13% - Low**

## EMS Training

✗ **Accreditation of emergency medicine as a medical specialty**

NA/NR **Regulations requiring to complete an accredited EMS training program**

NA/NR **Existing register of EMS professionals at a local or national level**

NA/NR **Training in crisis and disaster management included in EM curriculum[2]**

**Institutions ensuring pre-service EMS education for specialties/professions**
- ☐ First-responders degree programs
- ☐ Technical schools and community colleges
- ☐ Medical colleges / Nurse Schools (medium education institutions)
- ☑ Medical Universities
- ☐ Public Health Schools
- ☑ Other institutions

## EMS Communications

### Public Access

✅ **National Numbering Plan in force**

NA/NR **Single emergency number to access all emergency services**

✅ **Single emergency number or other emergency numbers free of charge**

NA/NR **Ability to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network**

**Other communication technologies used to contact EMS:**
NA/NR

### Dispatch and Control

NA/NR **Category the PSAP can be attributed to**
- ☐ Referral - The PSAPs answer the phone, ask pertinent questions and then advise the calling party of the proper number to call
- ☐ Relay - The PSAP answers the phone, gets all necessary information and then relays the message to the appropriate agency
- ☐ Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call to the appropriate responding agency
- ☐ Direct - The PSAP answers the phone, gets all information from the caller, and then directly dispatches the necessary response units

NA/NR **Legal framework to regulate the activity of PSAPs and ECCs[2]**

NA/NR **Type of communications technologies used at PSAP and ECC levels[2]**
- ☐ Land mobile radio systems (LMRS)
- ☐ Landline Telephone Systems
- ☐ Cellular Telephone Systems
- ☐ WIFI Systems
- ☐ IP Data Networks/Fiber Optic Connections
- ☐ Land Mobile Satellite Communications
- ☐ Other

NA/NR **PSAPs and ECCs equipped with a Computer Aided Dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)**

### Interagency Communication

NA/NR **EMS financing areas covered by regulations:**
- ☐ PSAP – all public safety agencies (fire, police, EMS, etc.)
- ☐ Communication between all public safety agencies
- ☐ First Responder team to ambulance
- ☐ First Responder team to dispatch
- ☐ First Responder to medical control
- ☐ ECC/Medical control to ambulance
- ☐ Telemetry from ambulance
- ☐ Ambulance to dispatch
- ☐ Ambulance to ambulance
- ☐ Ambulance to hospital
- ☐ Hospital ED to dispatch
- ☐ Hospital to hospital
- ☐ Helicopter to dispatch
- ☐ Ambulance to helicopter
- ☐ Helicopter to hospital

NA/NR **Regulations in force regarding the utilization of frequencies reserved for "Emergency Medical"**

NA/NR **Minimum technical standards for EMS to hospital communication[2]**

NA/NR **Regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)[2]**

NA/NR **The EMS pathway include Medical Control**

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[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%

[2] Quality and comprehensiveness of regulations are not included

[3] NA/NR: Data not available or no response given

## References

World Bank, The State of Emergency Medical Services (EMS) in Sub-Saharan Africa, 2021

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇱🇷 Liberia

**Survey completion[1]: 34% - Medium**

## EMS Standards

**NA/NR** — Right to care enshrined by Constitution or organic laws

**Model/approaches to organize and regulate pre-hospital emergency care:**
- ☐ National system
- ☐ Local or regional systems
- ☐ Private systems
- ☐ Hospital-based systems
- ☐ Public service integrated with Civil Protection Authority
- ☐ Fire service and/or police
- ☐ Volunteer systems
- ☑ Hybrid systems

**Authority responsible for development of EMS policies and accountable for EMS system:**
Ministry of Health

**Leading authority in crisis/disaster response:**
NA/NR

**NA/NR** — Legal requirement for EMS providers[2]
- ☐ Accreditation
- ☐ Licensing
- ☐ Other types of authorization

**NA/NR** — EMS standards state that an inspection to be regularly carried out*

✅ National level operational policies and protocols applicable to all authorized EMS providers[2], or

❌ Each EMS agency/provider have its own policies[2]

✅ Requirement to submit a copy of EMS patient report to patient at the time of transfer

**NA/NR** — Mechanisms in place to measure and/or monitor patient satisfaction and/or patient experience

**Out-of-hospital triage protocols followed:**
NA/NR

**Triage policy in transporting patients applied**
- ☑ Resource-Based START
- ☐ Non-conveyance
- ☐ Other (i.e. severity of patient's clinical condition)

**Policy regarding which hospital the patient will be transported to for emergency care**
- ☐ Normative judgments: designated hospital catchment area
- ☑ Nearest emergency department with available beds
- ☐ Complex method: candidate Emergency Departments' available capacities
- ☐ Waiting times, and distances from the incident scene
- ☐ No policy in place

**NA/NR** — Approved methodologies/regulations for planning and forecasting EMS personnel needs[2]

**NA/NR** — Approved methodologies/regulations for planning and forecasting EMS vehicle needs[2]

✅ **EMS vehicle staff requirements**
- ☐ Driver + 1 (1 EMT or Nurse)
- ☑ Driver + 2 (1 Basic EMT and 1 Advanced EMT)
- ☐ Driver + 2 (1 Physician and 1 Nurse or Paramedic)
- ☐ Driver + 3 (1 Physician, 1 Nurse, 1 Patient Transport Assistant)

## EMS Financing

**EMS financing areas covered by regulations[2]**
- ☑ Healthcare funds allocation
- ☑ Coverage schemes
- ☐ Exemption policies
- ☐ Tariffs
- ☐ Fees for non-covered
- ☐ Contracting health services
- ☐ Reimbursement
- ☐ Stewardship and oversight of payer organization
- ☐ Incentivize providers for efficiency and quality care
- ☐ Provider control and audit

**NA/NR** — Legal provisions regarding the mechanisms for allocating funds for EMS[2]
- ☐ Ad-hoc based on current needs
- ☐ EMS budget (without specifications) for Ministries with responsibilities in the field of crisis
- ☐ Share from MoH budget

✅ **Emergency medical services provided to households and individuals free of charge**

**NA/NR** — Insurance schemes used for EMS
- ☐ Government and/or MoH
- ☐ Private organizations
- ☐ Employers

**How the EMS is funded**
- ☑ MoH budget
- ☐ Separate government budget from MoH
- ☐ Private sector sources only
- ☐ User pays

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%
[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇱🇷 Liberia

**Survey completion[1]: 34% - Medium**

## EMS Training

❌ Accreditation of emergency medicine as a medical specialty

NA/NR Regulations requiring to complete an accredited EMS training program

✅ Existing register of EMS professionals at a local or national level

NA/NR Training in crisis and disaster management included in EM curriculum[2]

**Institutions ensuring pre-service EMS education for specialties/professions**
- ☐ First-responders degree programs
- ☐ Technical schools and community colleges
- ☑ Medical colleges / Nurse Schools (medium education institutions)
- ☐ Medical Universities
- ☐ Public Health Schools
- ☐ Other institutions

## EMS Communications

### Public Access

✅ National Numbering Plan in force

✅ Single emergency number to access all emergency services
911 (Fire, Police)

✅ Single emergency number or other emergency numbers free of charge

NA/NR Ability to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network

**Other communication technologies used to contact EMS:**
NA/NR

### Dispatch and Control

**Category the PSAP can be attributed to**
- ☑ Referral - The PSAPs answer the phone, ask pertinent questions and then advise the calling party of the proper number to call
- ☑ Relay - The PSAP answers the phone, gets all necessary information and then relays the message to the appropriate agency
- ☐ Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call to the appropriate responding agency
- ☑ Direct - The PSAP answers the phone, gets all information from the caller, and then directly dispatches the necessary response units

✅ Legal framework to regulate the activity of PSAPs and ECCs[2]

**Type of communications technologies used at PSAP and ECC levels[2]**
- ☑ Land mobile radio systems (LMRS)
- ☑ Landline Telephone Systems
- ☑ Cellular Telephone Systems
- ☐ WIFI Systems
- ☐ IP Data Networks/Fiber Optic Connections
- ☑ Land Mobile Satellite Communications
- ☐ Other

NA/NR PSAPs and ECCs equipped with a Computer Aided Dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)

### Interagency Communication

**EMS financing areas covered by regulations:**
- ☑ PSAP – all public safety agencies (fire, police, EMS, etc.)
- ☑ Communication between all public safety agencies
- ☑ First Responder team to ambulance
- ☑ First Responder team to dispatch
- ☐ First Responder to medical control
- ☑ ECC/Medical control to ambulance
- ☐ Telemetry from ambulance
- ☑ Ambulance to dispatch
- ☐ Ambulance to ambulance
- ☐ Ambulance to hospital
- ☐ Hospital ED to dispatch
- ☐ Hospital to hospital
- ☐ Helicopter to dispatch
- ☐ Ambulance to helicopter
- ☐ Helicopter to hospital

NA/NR Regulations in force regarding the utilization of frequencies reserved for "Emergency Medical"

NA/NR Minimum technical standards for EMS to hospital communication[2]

✅ Regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)[2]

✅ The EMS pathway include Medical Control

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[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%

[2] Quality and comprehensiveness of regulations are not included

[3] NA/NR: Data not available or no response given

## References

World Bank, The State of Emergency Medical Services (EMS) in Sub-Saharan Africa, 2021

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇱🇸 Lesotho

**Survey completion[1]: 54% - Medium**

## EMS Standards

### Governance

✅ **Right to care enshrined by Constitution or organic laws**

**Model/approaches to organize and regulate pre-hospital emergency care:**
- ☑ National system
- ☑ Local or regional systems
- ☑ Private systems
- ☑ Hospital-based systems
- ☑ Public service integrated with Civil Protection Authority
- ☑ Fire service and/or police
- ☑ Volunteer systems
- ☑ Hybrid systems

**Authority responsible for development of EMS policies and accountable for EMS system:**
Ministry of Health

**Leading authority in crisis/disaster response:**
Government

**Legal requirement for EMS providers[2]**
- ☐ Accreditation
- ☐ Licensing
- ☑ Other types of authorization

✅ **EMS standards state that an inspection to be regularly carried out***

### Service Delivery

✅ **National level operational policies and protocols applicable to all authorized EMS providers[2], or**

❌ **Each EMS agency/provider have its own policies[2]**

✅ **Requirement to submit a copy of EMS patient report to patient at the time of transfer**

✅ **Mechanisms in place to measure and/or monitor patient satisfaction and/or patient experience**

**Out-of-hospital triage protocols followed:**
National protocols

**Triage policy in transporting patients applied**
- ☑ Resource-Based START
- ☐ Non-conveyance
- ☐ Other (i.e. severity of patient's clinical condition)

**Policy regarding which hospital the patient will be transported to for emergency care**
- ☐ Normative judgments: designated hospital catchment area
- ☑ Nearest emergency department with available beds
- ☑ Complex method: candidate Emergency Departments' available capacities
- ☑ Waiting times, and distances from the incident scene
- ☐ No policy in place

### Resources

NA/NR **Approved methodologies/regulations for planning and forecasting EMS personnel needs[2]**

NA/NR **Approved methodologies/regulations for planning and forecasting EMS vehicle needs[2]**

✅ **EMS vehicle staff requirements**
- ☐ Driver + 1 (1 EMT or Nurse)
- ☐ Driver + 2 (1 Basic EMT and 1 Advanced EMT)
- ☐ Driver + 2 (1 Physician and 1 Nurse or Paramedic)
- ☑ Driver + 3 (1 Physician, 1 Nurse, 1 Patient Transport Assistant)

## EMS Financing

**EMS financing areas covered by regulations[2]**
- ☑ Healthcare funds allocation
- ☐ Coverage schemes
- ☐ Exemption policies
- ☐ Tariffs
- ☐ Fees for non-covered
- ☑ Contracting health services
- ☐ Reimbursement
- ☐ Stewardship and oversight of payer organization
- ☑ Incentivize providers for efficiency and quality care
- ☑ Provider control and audit

**Legal provisions regarding the mechanisms for allocating funds for EMS[2]**
- ☐ Ad-hoc based on current needs
- ☐ EMS budget (without specifications) for Ministries with responsibilities in the field of crisis
- ☑ Share from MoH budget

✅ **Emergency medical services provided to households and individuals free of charge**

❌ **Insurance schemes used for EMS**
No insurance schemes, Government services are free of char
- ☑ Government and/or MoH
- ☐ Private organizations
- ☐ Employers

NA/NR **How the EMS is funded**
- ☐ MoH budget
- ☐ Separate government budget from MoH
- ☐ Private sector sources only
- ☐ User pays

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%
[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇱🇸 Lesotho

**Survey completion[1]: 54% - Medium**

## EMS Training

✅ **Accreditation of emergency medicine as a medical specialty**

NA/NR **Regulations requiring to complete an accredited EMS training program**

NA/NR **Existing register of EMS professionals at a local or national level**

NA/NR **Training in crisis and disaster management included in EM curriculum[2]**

**Institutions ensuring pre-service EMS education for specialties/professions**
- ☐ First-responders degree programs
- ☐ Technical schools and community colleges
- ☑ Medical colleges / Nurse Schools (medium education institutions)
- ☐ Medical Universities
- ☐ Public Health Schools
- ☐ Other institutions

## EMS Communications

**Public Access**

✅ **National Numbering Plan in force**

NA/NR **Single emergency number to access all emergency services**

✅ **Single emergency number or other emergency numbers free of charge**

✅ **Ability to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network**

**Other communication technologies used to contact EMS:**
NA/NR

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**Dispatch and Control**

**Category the PSAP can be attributed to**
- ☑ Referral - The PSAPs answer the phone, ask pertinent questions and then advise the calling party of the proper number to call
- ☐ Relay - The PSAP answers the phone, gets all necessary information and then relays the message to the appropriate agency
- ☐ Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call to the appropriate responding agency
- ☑ Direct - The PSAP answers the phone, gets all information from the caller, and then directly dispatches the necessary response units

NA/NR **Legal framework to regulate the activity of PSAPs and ECCs[2]**

**Type of communications technologies used at PSAP and ECC levels[2]**
- ☐ Land mobile radio systems (LMRS)
- ☐ Landline Telephone Systems
- ☑ Cellular Telephone Systems
- ☐ WIFI Systems
- ☐ IP Data Networks/Fiber Optic Connections
- ☐ Land Mobile Satellite Communications
- ☐ Other

✅ **PSAPs and ECCs equipped with a Computer Aided Dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)**

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**Interagency Communication**

**EMS financing areas covered by regulations:**
- ☑ PSAP – all public safety agencies (fire, police, EMS, etc.)
- ☑ Communication between all public safety agencies
- ☑ First Responder team to ambulance
- ☑ First Responder team to dispatch
- ☐ First Responder to medical control
- ☐ ECC/Medical control to ambulance
- ☐ Telemetry from ambulance
- ☑ Ambulance to dispatch
- ☑ Ambulance to ambulance
- ☑ Ambulance to hospital
- ☑ Hospital ED to dispatch
- ☐ Hospital to hospital
- ☐ Helicopter to dispatch
- ☐ Ambulance to helicopter
- ☐ Helicopter to hospital

NA/NR **Regulations in force regarding the utilization of frequencies reserved for "Emergency Medical"**

NA/NR **Minimum technical standards for EMS to hospital communication[2]**

NA/NR **Regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)[2]**

NA/NR **The EMS pathway include Medical Control**

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[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%

[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

## References

**World Bank, The State of Emergency Medical Services (EMS) in Sub-Saharan Africa, 2021**

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇲🇬 **Madagascar**

**Survey completion[1]: 34% - Medium**

## EMS Standards

✅ **Right to care enshrined by Constitution or organic laws**

**Model/approaches to organize and regulate pre-hospital emergency care:**

- ☑ National system
- ☐ Local or regional systems
- ☐ Private systems
- ☐ Hospital-based systems
- ☐ Public service integrated with Civil Protection Authority
- ☐ Fire service and/or police
- ☐ Volunteer systems
- ☐ Hybrid systems

**Authority responsible for development of EMS policies and accountable for EMS system:**
Ministry of Health, EMS Center

**Leading authority in crisis/disaster response:**
NA/NR

NA/NR **Legal requirement for EMS providers[2]**
- ☐ Accreditation          ☐ Licensing
- ☐ Other types of authorization

✅ **EMS standards state that an inspection to be regularly carried out***

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NA/NR **National level operational policies and protocols applicable to all authorized EMS providers[2], or**

NA/NR **Each EMS agency/provider have its own policies[2]**

✅ **Requirement to submit a copy of EMS patient report to patient at the time of transfer**

✅ **Mechanisms in place to measure and/or monitor patient satisfaction and/or patient experience**

**Out-of-hospital triage protocols followed:**
NA/NR

NA/NR **Triage policy in transporting patients applied**
- ☐ Resource-Based START
- ☐ Non-conveyance
- ☐ Other (i.e. severity of patient's clinical condition)

NA/NR **Policy regarding which hospital the patient will be transported to for emergency care**
- ☐ Normative judgments: designated hospital catchment area
- ☐ Nearest emergency department with available beds
- ☐ Complex method: candidate Emergency Departments' available capacities
- ☐ Waiting times, and distances from the incident scene
- ☐ No policy in place

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NA/NR **Approved methodologies/regulations for planning and forecasting EMS personnel needs[2]**

NA/NR **Approved methodologies/regulations for planning and forecasting EMS vehicle needs[2]**

✅ **EMS vehicle staff requirements**
- ☐ Driver + 1 (1 EMT or Nurse)
- ☐ Driver + 2 (1 Basic EMT and 1 Advanced EMT)
- ☐ Driver + 2 (1 Physician and 1 Nurse or Paramedic)
- ☑ Driver + 3 (1 Physician, 1 Nurse, 1 Patient Transport Assistant)

## EMS Financing

**EMS financing areas covered by regulations[2]**
- ☑ Healthcare funds allocation
- ☑ Coverage schemes
- ☑ Exemption policies
- ☑ Tariffs
- ☐ Fees for non-covered
- ☐ Contracting health services
- ☐ Reimbursement
- ☐ Stewardship and oversight of payer organization
- ☐ Incentivize providers for efficiency and quality care
- ☐ Provider control and audit

**Legal provisions regarding the mechanisms for allocating funds for EMS[2]**
- ☐ Ad-hoc based on current needs
- ☐ EMS budget (without specifications) for Ministries with responsibilities in the field of crisis
- ☑ Share from MoH budget

✅ **Emergency medical services provided to households and individuals free of charge**

✅ **Insurance schemes used for EMS**
Who provides the insurance schemes:
- ☑ Government and/or MoH
- ☐ Private organizations
- ☑ Employers

**How the EMS is funded**
- ☑ MoH budget
- ☐ Separate government budget from MoH
- ☑ Private sector sources only
- ☑ User pays

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%
[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇲🇬 **Madagascar**

**Survey completion[1]: 34% - Medium**

## EMS Training

- ✅ **Accreditation of emergency medicine as a medical specialty**
- ✅ **Regulations requiring to complete an accredited EMS training program**
- NA/NR **Existing register of EMS professionals at a local or national level**
- ✅ **Training in crisis and disaster management included in EM curriculum[2]**

**Institutions ensuring pre-service EMS education for specialties/professions**
- ☐ First-responders degree programs
- ☐ Technical schools and community colleges
- ☐ Medical colleges / Nurse Schools (medium education institutions)
- ☑ Medical Universities
- ☑ Public Health Schools
- ☐ Other institutions

## EMS Communications

### Public Access

- ✅ **National Numbering Plan in force**
- NA/NR **Single emergency number to access all emergency services**
- ✅ **Single emergency number or other emergency numbers free of charge**

- NA/NR **Ability to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network**

**Other communication technologies used to contact EMS:**
NA/NR

### Dispatch and Control

**Category the PSAP can be attributed to**
- ☐ Referral - The PSAPs answer the phone, ask pertinent questions and then advise the calling party of the proper number to call
- ☐ Relay - The PSAP answers the phone, gets all necessary information and then relays the message to the appropriate agency
- ☐ Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call to the appropriate responding agency
- ☑ Direct - The PSAP answers the phone, gets all information from the caller, and then directly dispatches the necessary response units

NA/NR **Legal framework to regulate the activity of PSAPs and ECCs[2]**

NA/NR **Type of communications technologies used at PSAP and ECC levels[2]**
- ☐ Land mobile radio systems (LMRS)
- ☐ Landline Telephone Systems
- ☐ Cellular Telephone Systems
- ☐ WIFI Systems
- ☐ IP Data Networks/Fiber Optic Connections
- ☐ Land Mobile Satellite Communications
- ☐ Other

NA/NR **PSAPs and ECCs equipped with a Computer Aided Dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)**

### Interagency Communication

**EMS financing areas covered by regulations:**
- ☑ PSAP – all public safety agencies (fire, police, EMS, etc.)
- ☑ Communication between all public safety agencies
- ☐ First Responder team to ambulance
- ☑ First Responder team to dispatch
- ☐ First Responder to medical control
- ☑ ECC/Medical control to ambulance
- ☐ Telemetry from ambulance
- ☑ Ambulance to dispatch
- ☐ Ambulance to ambulance
- ☐ Ambulance to hospital
- ☑ Hospital ED to dispatch
- ☐ Hospital to hospital
- ☑ Helicopter to dispatch
- ☐ Ambulance to helicopter
- ☐ Helicopter to hospital

NA/NR **Regulations in force regarding the utilization of frequencies reserved for "Emergency Medical"**

NA/NR **Minimum technical standards for EMS to hospital communication[2]**

✅ **Regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)[2]**

NA/NR **The EMS pathway include Medical Control**

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%

[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

## References

World Bank, The State of Emergency Medical Services (EMS) in Sub-Saharan Africa, 2021

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇲🇷 **Mauritania**

**Survey completion[1]: 19% - Low**

## EMS Standards

*Governance*

✅ **Right to care enshrined by Constitution or organic laws**

**Model/approaches to organize and regulate pre-hospital emergency care:**
- ☐ National system
- ☐ Local or regional systems
- ☑ Private systems
- ☐ Hospital-based systems
- ☐ Public service integrated with Civil Protection Authority
- ☐ Fire service and/or police
- ☐ Volunteer systems
- ☐ Hybrid systems

**Authority responsible for development of EMS policies and accountable for EMS system:**
NA/NR

**Leading authority in crisis/disaster response:**
Civil Protection Authority (MoIA)

NA/NR **Legal requirement for EMS providers[2]**
- ☐ Accreditation          ☐ Licensing
- ☐ Other types of authorization

NA/NR **EMS standards state that an inspection to be regularly carried out***

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*Service Delivery*

❌ **National level operational policies and protocols applicable to all authorized EMS providers[2], or**

✅ **Each EMS agency/provider have its own policies[2]**

NA/NR **Requirement to submit a copy of EMS patient report to patient at the time of transfer**

NA/NR **Mechanisms in place to measure and/or monitor patient satisfaction and/or patient experience**

**Out-of-hospital triage protocols followed:**
EMS provider protocols

NA/NR **Triage policy in transporting patients applied**
- ☐ Resource-Based START
- ☐ Non-conveyance
- ☐ Other (i.e. severity of patient's clinical condition)

NA/NR **Policy regarding which hospital the patient will be transported to for emergency care**
- ☐ Normative judgments: designated hospital catchment area
- ☐ Nearest emergency department with available beds
- ☐ Complex method: candidate Emergency Departments' available capacities
- ☐ Waiting times, and distances from the incident scene
- ☐ No policy in place

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*Resources*

NA/NR **Approved methodologies/regulations for planning and forecasting EMS personnel needs[2]**

NA/NR **Approved methodologies/regulations for planning and forecasting EMS vehicle needs[2]**

NA/NR **EMS vehicle staff requirements**
- ☐ Driver + 1 (1 EMT or Nurse)
- ☐ Driver + 2 (1 Basic EMT and 1 Advanced EMT)
- ☐ Driver + 2 (1 Physician and 1 Nurse or Paramedic)
- ☐ Driver + 3 (1 Physician, 1 Nurse, 1 Patient Transport Assistant)

## EMS Financing

**EMS financing areas covered by regulations[2]**
- ☑ Healthcare funds allocation
- ☑ Coverage schemes
- ☐ Exemption policies
- ☐ Tariffs
- ☐ Fees for non-covered
- ☐ Contracting health services
- ☐ Reimbursement
- ☐ Stewardship and oversight of payer organization
- ☐ Incentivize providers for efficiency and quality care
- ☐ Provider control and audit

NA/NR **Legal provisions regarding the mechanisms for allocating funds for EMS[2]**
- ☐ Ad-hoc based on current needs
- ☐ EMS budget (without specifications) for Ministries with responsibilities in the field of crisis
- ☐ Share from MoH budget

✅ **Emergency medical services provided to households and individuals free of charge**

✅ **Insurance schemes used for EMS**
Who provides the insurance schemes:
- ☑ Government and/or MoH
- ☐ Private organizations
- ☐ Employers

**How the EMS is funded**
- ☑ MoH budget
- ☐ Separate government budget from MoH
- ☐ Private sector sources only
- ☐ User pays

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%
[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇲🇷 **Mauritania**

**Survey completion[1]: 19% - Low**

## EMS Training

✗ Accreditation of emergency medicine as a medical specialty

NA/NR Regulations requiring to complete an accredited EMS training program

NA/NR Existing register of EMS professionals at a local or national level

NA/NR Training in crisis and disaster management included in EM curriculum[2]

NA/NR Institutions ensuring pre-service EMS education for specialties/professions
- ☐ First-responders degree programs
- ☐ Technical schools and community colleges
- ☐ Medical colleges / Nurse Schools (medium education institutions)
- ☐ Medical Universities
- ☐ Public Health Schools
- ☐ Other institutions

## EMS Communications

### Public Access

✅ National Numbering Plan in force

NA/NR Single emergency number to access all emergency services

✅ Single emergency number or other emergency numbers free of charge

NA/NR Ability to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network

Other communication technologies used to contact EMS:
NA/NR

### Dispatch and Control

NA/NR Category the PSAP can be attributed to
- ☐ Referral - The PSAPs answer the phone, ask pertinent questions and then advise the calling party of the proper number to call
- ☐ Relay - The PSAP answers the phone, gets all necessary information and then relays the message to the appropriate agency
- ☐ Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call to the appropriate responding agency
- ☐ Direct - The PSAP answers the phone, gets all information from the caller, and then directly dispatches the necessary response units

NA/NR Type of communications technologies used at PSAP and ECC levels[2]
- ☐ Land mobile radio systems (LMRS)
- ☐ Landline Telephone Systems
- ☐ Cellular Telephone Systems
- ☐ WIFI Systems
- ☐ IP Data Networks/Fiber Optic Connections
- ☐ Land Mobile Satellite Communications
- ☐ Other

NA/NR Legal framework to regulate the activity of PSAPs and ECCs[2]

NA/NR PSAPs and ECCs equipped with a Computer Aided Dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)

### Interagency Communication

NA/NR EMS financing areas covered by regulations:
- ☐ PSAP – all public safety agencies (fire, police, EMS, etc.)
- ☐ Communication between all public safety agencies
- ☐ First Responder team to ambulance
- ☐ First Responder team to dispatch
- ☐ First Responder to medical control
- ☐ ECC/Medical control to ambulance
- ☐ Telemetry from ambulance
- ☐ Ambulance to dispatch
- ☐ Ambulance to ambulance
- ☐ Ambulance to hospital
- ☐ Hospital ED to dispatch
- ☐ Hospital to hospital
- ☐ Helicopter to dispatch
- ☐ Ambulance to helicopter
- ☐ Helicopter to hospital

NA/NR Regulations in force regarding the utilization of frequencies reserved for "Emergency Medical"

NA/NR Minimum technical standards for EMS to hospital communication[2]

NA/NR Regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)[2]

NA/NR The EMS pathway include Medical Control

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[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%

[2] Quality and comprehensiveness of regulations are not included

[3] NA/NR: Data not available or no response given

## References

World Bank, The State of Emergency Medical Services (EMS) in Sub-Saharan Africa, 2021

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇲🇼 **Malawi**

**Survey completion[1]: 17% - Low**

## EMS Standards

✅ **Right to care enshrined by Constitution or organic laws**

**Model/approaches to organize and regulate pre-hospital emergency care:**
- ☑ National system
- ☐ Local or regional systems
- ☐ Private systems
- ☐ Hospital-based systems
- ☐ Public service integrated with Civil Protection Authority
- ☐ Fire service and/or police
- ☐ Volunteer systems
- ☐ Hybrid systems

**Authority responsible for development of EMS policies and accountable for EMS system:**
NA/NR

**Leading authority in crisis/disaster response:**
NA/NR

NA/NR **Legal requirement for EMS providers[2]**
- ☐ Accreditation
- ☐ Licensing
- ☐ Other types of authorization

✅ **EMS standards state that an inspection to be regularly carried out***

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_(Service Delivery)_

NA/NR **National level operational policies and protocols applicable to all authorized EMS providers[2], or**

NA/NR **Each EMS agency/provider have its own policies[2]**

NA/NR **Requirement to submit a copy of EMS patient report to patient at the time of transfer**

NA/NR **Mechanisms in place to measure and/or monitor patient satisfaction and/or patient experience**

**Out-of-hospital triage protocols followed:**
NA/NR

NA/NR **Triage policy in transporting patients applied**
- ☐ Resource-Based START
- ☐ Non-conveyance
- ☐ Other (i.e. severity of patient's clinical condition)

NA/NR **Policy regarding which hospital the patient will be transported to for emergency care**
- ☐ Normative judgments: designated hospital catchment area
- ☐ Nearest emergency department with available beds
- ☐ Complex method: candidate Emergency Departments' available capacities
- ☐ Waiting times, and distances from the incident scene
- ☐ No policy in place

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_(Resources)_

NA/NR **Approved methodologies/regulations for planning and forecasting EMS personnel needs[2]**

NA/NR **Approved methodologies/regulations for planning and forecasting EMS vehicle needs[2]**

NA/NR **EMS vehicle staff requirements**
- ☐ Driver + 1 (1 EMT or Nurse)
- ☐ Driver + 2 (1 Basic EMT and 1 Advanced EMT)
- ☐ Driver + 2 (1 Physician and 1 Nurse or Paramedic)
- ☐ Driver + 3 (1 Physician, 1 Nurse, 1 Patient Transport Assistant)

## EMS Financing

NA/NR **EMS financing areas covered by regulations[2]**
- ☐ Healthcare funds allocation
- ☐ Coverage schemes
- ☐ Exemption policies
- ☐ Tariffs
- ☐ Fees for non-covered
- ☐ Contracting health services
- ☐ Reimbursement
- ☐ Stewardship and oversight of payer organization
- ☐ Incentivize providers for efficiency and quality care
- ☐ Provider control and audit

NA/NR **Legal provisions regarding the mechanisms for allocating funds for EMS[2]**
- ☐ Ad-hoc based on current needs
- ☐ EMS budget (without specifications) for Ministries with responsibilities in the field of crisis
- ☐ Share from MoH budget

✅ **Emergency medical services provided to households and individuals free of charge**

NA/NR **Insurance schemes used for EMS**
- ☐ Government and/or MoH
- ☐ Private organizations
- ☐ Employers

NA/NR **How the EMS is funded**
- ☐ MoH budget
- ☐ Separate government budget from MoH
- ☐ Private sector sources only
- ☐ User pays

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%
[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇲🇼 **Malawi**

**Survey completion[1]: 17% - Low**

## EMS Training

❌ **Accreditation of emergency medicine as a medical specialty**

✅ **Regulations requiring to complete an accredited EMS training program**

NA/NR **Existing register of EMS professionals at a local or national level**

NA/NR **Training in crisis and disaster management included in EM curriculum[2]**

**Institutions ensuring pre-service EMS education for specialties/professions**
- ☐ First-responders degree programs
- ☐ Technical schools and community colleges
- ☑ Medical colleges / Nurse Schools (medium education institutions)
- ☐ Medical Universities
- ☐ Public Health Schools
- ☐ Other institutions

## EMS Communications

### Public Access

✅ **National Numbering Plan in force**

NA/NR **Single emergency number to access all emergency services**

✅ **Single emergency number or other emergency numbers free of charge**

NA/NR **Ability to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network**

**Other communication technologies used to contact EMS:**
NA/NR

### Dispatch and Control

**Category the PSAP can be attributed to**
- ☐ Referral - The PSAPs answer the phone, ask pertinent questions and then advise the calling party of the proper number to call
- ☐ Relay - The PSAP answers the phone, gets all necessary information and then relays the message to the appropriate agency
- ☑ Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call to the appropriate responding agency
- ☐ Direct - The PSAP answers the phone, gets all information from the caller, and then directly dispatches the necessary response units

NA/NR **Legal framework to regulate the activity of PSAPs and ECCs[2]**

NA/NR **Type of communications technologies used at PSAP and ECC levels[2]**
- ☐ Land mobile radio systems (LMRS)
- ☐ Landline Telephone Systems
- ☐ Cellular Telephone Systems
- ☐ WIFI Systems
- ☐ IP Data Networks/Fiber Optic Connections
- ☐ Land Mobile Satellite Communications
- ☐ Other

NA/NR **PSAPs and ECCs equipped with a Computer Aided Dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)**

### Interagency Communication

**EMS financing areas covered by regulations:**
- ☑ PSAP – all public safety agencies (fire, police, EMS, etc.)
- ☑ Communication between all public safety agencies
- ☑ First Responder team to ambulance
- ☐ First Responder team to dispatch
- ☐ First Responder to medical control
- ☑ ECC/Medical control to ambulance
- ☐ Telemetry from ambulance
- ☐ Ambulance to dispatch
- ☑ Ambulance to ambulance
- ☑ Ambulance to hospital
- ☐ Hospital ED to dispatch
- ☐ Hospital to hospital
- ☑ Helicopter to dispatch
- ☑ Ambulance to helicopter
- ☐ Helicopter to hospital

NA/NR **Regulations in force regarding the utilization of frequencies reserved for "Emergency Medical"**

NA/NR **Minimum technical standards for EMS to hospital communication[2]**

NA/NR **Regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)[2]**

NA/NR **The EMS pathway include Medical Control**

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[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%

[2] Quality and comprehensiveness of regulations are not included

[3] NA/NR: Data not available or no response given

## References

World Bank, The State of Emergency Medical Services (EMS) in Sub-Saharan Africa, 2021

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇳🇪 Niger

**Survey completion[1]: 43% - Medium**

## EMS Standards

✅ **Right to care enshrined by Constitution or organic laws**

**Model/approaches to organize and regulate pre-hospital emergency care:**

- ☑ National system
- ☐ Local or regional systems
- ☐ Private systems
- ☐ Hospital-based systems
- ☐ Public service integrated with Civil Protection Authority
- ☐ Fire service and/or police
- ☐ Volunteer systems
- ☐ Hybrid systems

**Authority responsible for development of EMS policies and accountable for EMS system:**
Ministry of Health

**Leading authority in crisis/disaster response:**
Ministry of Health, Civil Protection Authority (MoIA)

**Legal requirement for EMS providers[2]**

- ☐ Accreditation
- ☐ Licensing
- ☑ Other types of authorization

NA/NR **EMS standards state that an inspection to be regularly carried out***

*Governance*

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NA/NR **National level operational policies and protocols applicable to all authorized EMS providers[2], or**

NA/NR **Each EMS agency/provider have its own policies[2]**

✅ **Requirement to submit a copy of EMS patient report to patient at the time of transfer**

✅ **Mechanisms in place to measure and/or monitor patient satisfaction and/or patient experience**

**Out-of-hospital triage protocols followed:**
National protocols

**Triage policy in transporting patients applied**

- ☐ Resource-Based START
- ☐ Non-conveyance
- ☑ Other (i.e. severity of patient's clinical condition)

**Policy regarding which hospital the patient will be transported to for emergency care**

- ☐ Normative judgments: designated hospital catchment area
- ☑ Nearest emergency department with available beds
- ☐ Complex method: candidate Emergency Departments' available capacities
- ☐ Waiting times, and distances from the incident scene
- ☐ No policy in place

*Service Delivery*

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NA/NR **Approved methodologies/regulations for planning and forecasting EMS personnel needs[2]**

NA/NR **Approved methodologies/regulations for planning and forecasting EMS vehicle needs[2]**

✅ **EMS vehicle staff requirements**

- ☐ Driver + 1 (1 EMT or Nurse)
- ☐ Driver + 2 (1 Basic EMT and 1 Advanced EMT)
- ☑ Driver + 2 (1 Physician and 1 Nurse or Paramedic)
- ☐ Driver + 3 (1 Physician, 1 Nurse, 1 Patient Transport Assistant)

*Resources*

## EMS Financing

**EMS financing areas covered by regulations[2]**

- ☑ Healthcare funds allocation
- ☑ Coverage schemes
- ☐ Exemption policies
- ☑ Tariffs
- ☐ Fees for non-covered
- ☐ Contracting health services
- ☐ Reimbursement
- ☐ Stewardship and oversight of payer organization
- ☑ Incentivize providers for efficiency and quality care
- ☑ Provider control and audit

**Legal provisions regarding the mechanisms for allocating funds for EMS[2]**

- ☐ Ad-hoc based on current needs
- ☐ EMS budget (without specifications) for Ministries with responsibilities in the field of crisis
- ☑ Share from MoH budget

✅ **Emergency medical services provided to households and individuals free of charge**

✅ **Insurance schemes used for EMS**
Who provides the insurance schemes:

- ☑ Government and/or MoH
- ☑ Private organizations
- ☑ Employers

**How the EMS is funded**

- ☑ MoH budget
- ☐ Separate government budget from MoH
- ☑ Private sector sources only
- ☐ User pays

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%
[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇳🇪 Niger

**Survey completion[1]: 43% - Medium**

## EMS Training

✅ **Accreditation of emergency medicine as a medical specialty**

✅ **Regulations requiring to complete an accredited EMS training program**

✅ **Existing register of EMS professionals at a local or national level**

✅ **Training in crisis and disaster management included in EM curriculum[2]**

**Institutions ensuring pre-service EMS education for specialties/professions**

- ☐ First-responders degree programs
- ☐ Technical schools and community colleges
- ☐ Medical colleges / Nurse Schools (medium education institutions)
- ☑ Medical Universities
- ☑ Public Health Schools
- ☑ Other institutions

## EMS Communications

**Public Access**

✅ **National Numbering Plan in force**

NA/NR **Single emergency number to access all emergency services**

✅ **Single emergency number or other emergency numbers free of charge**

✅ **Ability to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network**

**Other communication technologies used to contact EMS:**
NA/NR

**Dispatch and Control**

**Category the PSAP can be attributed to**

- ☐ Referral - The PSAPs answer the phone, ask pertinent questions and then advise the calling party of the proper number to call
- ☐ Relay - The PSAP answers the phone, gets all necessary information and then relays the message to the appropriate agency
- ☐ Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call to the appropriate responding agency
- ☑ Direct - The PSAP answers the phone, gets all information from the caller, and then directly dispatches the necessary response units

**Type of communications technologies used at PSAP and ECC levels[2]**

- ☐ Land mobile radio systems (LMRS)
- ☑ Landline Telephone Systems
- ☑ Cellular Telephone Systems
- ☐ WIFI Systems
- ☐ IP Data Networks/Fiber Optic Connections
- ☐ Land Mobile Satellite Communications
- ☐ Other

✅ **Legal framework to regulate the activity of PSAPs and ECCs[2]**

✅ **PSAPs and ECCs equipped with a Computer Aided Dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)**

**Interagency Communication**

NA/NR **EMS financing areas covered by regulations:**

- ☐ PSAP – all public safety agencies (fire, police, EMS, etc.)
- ☐ Communication between all public safety agencies
- ☐ First Responder team to ambulance
- ☐ First Responder team to dispatch
- ☐ First Responder to medical control
- ☐ ECC/Medical control to ambulance
- ☐ Telemetry from ambulance
- ☐ Ambulance to dispatch
- ☐ Ambulance to ambulance
- ☐ Ambulance to hospital
- ☐ Hospital ED to dispatch
- ☐ Hospital to hospital
- ☐ Helicopter to dispatch
- ☐ Ambulance to helicopter
- ☐ Helicopter to hospital

NA/NR **Regulations in force regarding the utilization of frequencies reserved for "Emergency Medical"**

NA/NR **Minimum technical standards for EMS to hospital communication[2]**

✅ **Regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)[2]**

NA/NR **The EMS pathway include Medical Control**

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%

[2] Quality and comprehensiveness of regulations are not included

[3] NA/NR: Data not available or no response given

## References

World Bank, The State of Emergency Medical Services (EMS) in Sub-Saharan Africa, 2021

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇷🇼 Rwanda

**Survey completion[1]: 62% - High**

## EMS Standards

✅ **Right to care enshrined by Constitution or organic laws**

**Model/approaches to organize and regulate pre-hospital emergency care:**

- ☑ National system
- ☐ Local or regional systems
- ☐ Private systems
- ☐ Hospital-based systems
- ☐ Public service integrated with Civil Protection Authority
- ☐ Fire service and/or police
- ☐ Volunteer systems
- ☐ Hybrid systems

**Authority responsible for development of EMS policies and accountable for EMS system:**
Ministry of Health

**Leading authority in crisis/disaster response:**
Ministry of Emergency Management

**Legal requirement for EMS providers[2]**

- ☐ Accreditation
- ☑ Licensing
- ☐ Other types of authorization

✅ **EMS standards state that an inspection to be regularly carried out***

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NA/NR **National level operational policies and protocols applicable to all authorized EMS providers[2], or**

NA/NR **Each EMS agency/provider have its own policies[2]**

NA/NR **Requirement to submit a copy of EMS patient report to patient at the time of transfer**

NA/NR **Mechanisms in place to measure and/or monitor patient satisfaction and/or patient experience**

**Out-of-hospital triage protocols followed:**
National protocols

**Triage policy in transporting patients applied**

- ☑ Resource-Based START
- ☐ Non-conveyance
- ☐ Other (i.e. severity of patient's clinical condition)

**Policy regarding which hospital the patient will be transported to for emergency care**

- ☐ Normative judgments: designated hospital catchment area
- ☐ Nearest emergency department with available beds
- ☐ Complex method: candidate Emergency Departments' available capacities
- ☐ Waiting times, and distances from the incident scene
- ☐ No policy in place

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✅ **Approved methodologies/regulations for planning and forecasting EMS personnel needs[2]**

✅ **Approved methodologies/regulations for planning and forecasting EMS vehicle needs[2]**

✅ **EMS vehicle staff requirements**

- ☐ Driver + 1 (1 EMT or Nurse)
- ☐ Driver + 2 (1 Basic EMT and 1 Advanced EMT)
- ☑ Driver + 2 (1 Physician and 1 Nurse or Paramedic)
- ☐ Driver + 3 (1 Physician, 1 Nurse, 1 Patient Transport Assistant)

*Governance*

*Service Delivery*

*Resources*

## EMS Financing

**EMS financing areas covered by regulations[2]**

- ☑ Healthcare funds allocation
- ☑ Coverage schemes
- ☑ Exemption policies
- ☑ Tariffs
- ☑ Fees for non-covered
- ☑ Contracting health services
- ☑ Reimbursement
- ☑ Stewardship and oversight of payer organization
- ☑ Incentivize providers for efficiency and quality care
- ☐ Provider control and audit

**Legal provisions regarding the mechanisms for allocating funds for EMS[2]**

- ☐ Ad-hoc based on current needs
- ☐ EMS budget (without specifications) for Ministries with responsibilities in the field of crisis
- ☑ Share from MoH budget

NA/NR **Emergency medical services provided to households and individuals free of charge**

✅ **Insurance schemes used for EMS**
Who provides the insurance schemes:

- ☐ Government and/or MoH
- ☑ Private organizations
- ☐ Employers

**How the EMS is funded**

- ☑ MoH budget
- ☐ Separate government budget from MoH
- ☐ Private sector sources only
- ☐ User pays

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[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%
[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇷🇼 Rwanda

**Survey completion[1]: 62% - High**

## EMS Training

- ✅ **Accreditation of emergency medicine as a medical specialty**
- ✅ **Regulations requiring to complete an accredited EMS training program**
- ✅ **Existing register of EMS professionals at a local or national level**
- ✅ **Training in crisis and disaster management included in EM curriculum[2]**

**Institutions ensuring pre-service EMS education for specialties/professions**
- ☐ First-responders degree programs
- ☐ Technical schools and community colleges
- ☐ Medical colleges / Nurse Schools (medium education institutions)
- ☑ Medical Universities
- ☐ Public Health Schools
- ☐ Other institutions

## EMS Communications

*Public Access*

- ✅ **National Numbering Plan in force**
- NA/NR **Single emergency number to access all emergency services**
- ✅ **Single emergency number or other emergency numbers free of charge**

- ✅ **Ability to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network**

**Other communication technologies used to contact EMS:**
  SMS

*Dispatch and Control*

**Category the PSAP can be attributed to**
- ☐ Referral - The PSAPs answer the phone, ask pertinent questions and then advise the calling party of the proper number to call
- ☐ Relay - The PSAP answers the phone, gets all necessary information and then relays the message to the appropriate agency
- ☐ Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call to the appropriate responding agency
- ☑ Direct - The PSAP answers the phone, gets all information from the caller, and then directly dispatches the necessary response units

- NA/NR **Legal framework to regulate the activity of PSAPs and ECCs[2]**

**Type of communications technologies used at PSAP and ECC levels[2]**
- ☑ Land mobile radio systems (LMRS)
- ☑ Landline Telephone Systems
- ☑ Cellular Telephone Systems
- ☐ WIFI Systems
- ☐ IP Data Networks/Fiber Optic Connections
- ☐ Land Mobile Satellite Communications
- ☐ Other

- ✅ **PSAPs and ECCs equipped with a Computer Aided Dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)**

*Interagency Communication*

- NA/NR **EMS financing areas covered by regulations:**
  - ☐ PSAP – all public safety agencies (fire, police, EMS, etc.)
  - ☐ Communication between all public safety agencies
  - ☐ First Responder team to ambulance
  - ☐ First Responder team to dispatch
  - ☐ First Responder to medical control
  - ☐ ECC/Medical control to ambulance
  - ☐ Telemetry from ambulance
  - ☐ Ambulance to dispatch
  - ☐ Ambulance to ambulance
  - ☐ Ambulance to hospital
  - ☐ Hospital ED to dispatch
  - ☐ Hospital to hospital
  - ☐ Helicopter to dispatch
  - ☐ Ambulance to helicopter
  - ☐ Helicopter to hospital

- NA/NR **Regulations in force regarding the utilization of frequencies reserved for "Emergency Medical"**
- NA/NR **Minimum technical standards for EMS to hospital communication[2]**
- ✅ **Regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)[2]**
- NA/NR **The EMS pathway include Medical Control**

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%

[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

## References

World Bank, The State of Emergency Medical Services (EMS) in Sub-Saharan Africa, 2021

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇸🇩 Sudan

**Survey completion[1]: 57% - High**

## EMS Standards

*Governance*

✅ **Right to care enshrined by Constitution or organic laws**

**Model/approaches to organize and regulate pre-hospital emergency care:**
- ☐ National system
- ☐ Local or regional systems
- ☑ Private systems
- ☐ Hospital-based systems
- ☐ Public service integrated with Civil Protection Authority
- ☐ Fire service and/or police
- ☐ Volunteer systems
- ☐ Hybrid systems

**Authority responsible for development of EMS policies and accountable for EMS system:**
Ministry of Health

**Leading authority in crisis/disaster response:**
Civil Protection Authority (MoIA)

**Legal requirement for EMS providers[2]**
- ☐ Accreditation
- ☐ Licensing
- ☑ Other types of authorization

✅ **EMS standards state that an inspection to be regularly carried out***

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*Service Delivery*

❌ **National level operational policies and protocols applicable to all authorized EMS providers[2], or**

✅ **Each EMS agency/provider have its own policies[2]**

NA/NR **Requirement to submit a copy of EMS patient report to patient at the time of transfer**

NA/NR **Mechanisms in place to measure and/or monitor patient satisfaction and/or patient experience**

**Out-of-hospital triage protocols followed:**
National protocols

**Triage policy in transporting patients applied**
- ☑ Resource-Based START
- ☐ Non-conveyance
- ☐ Other (i.e. severity of patient's clinical condition)

**Policy regarding which hospital the patient will be transported to for emergency care**
- ☐ Normative judgments: designated hospital catchment area
- ☑ Nearest emergency department with available beds
- ☑ Complex method: candidate Emergency Departments' available capacities
- ☑ Waiting times, and distances from the incident scene
- ☐ No policy in place

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*Resources*

NA/NR **Approved methodologies/regulations for planning and forecasting EMS personnel needs[2]**

NA/NR **Approved methodologies/regulations for planning and forecasting EMS vehicle needs[2]**

✅ **EMS vehicle staff requirements**
- ☑ Driver + 1 (1 EMT or Nurse)
- ☐ Driver + 2 (1 Basic EMT and 1 Advanced EMT)
- ☐ Driver + 2 (1 Physician and 1 Nurse or Paramedic)
- ☐ Driver + 3 (1 Physician, 1 Nurse, 1 Patient Transport Assistant)

## EMS Financing

**EMS financing areas covered by regulations[2]**
- ☑ Healthcare funds allocation
- ☑ Coverage schemes
- ☑ Exemption policies
- ☑ Tariffs
- ☑ Fees for non-covered
- ☑ Contracting health services
- ☑ Reimbursement
- ☑ Stewardship and oversight of payer organization
- ☑ Incentivize providers for efficiency and quality care
- ☐ Provider control and audit

NA/NR **Legal provisions regarding the mechanisms for allocating funds for EMS[2]**
- ☐ Ad-hoc based on current needs
- ☐ EMS budget (without specifications) for Ministries with responsibilities in the field of crisis
- ☐ Share from MoH budget

✅ **Emergency medical services provided to households and individuals free of charge**

NA/NR **Insurance schemes used for EMS**

- ☐ Government and/or MoH
- ☐ Private organizations
- ☐ Employers

**How the EMS is funded**
- ☑ MoH budget
- ☑ Separate government budget from MoH
- ☑ Private sector sources only
- ☑ User pays

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%
[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇸🇩 Sudan

**Survey completion[1]: 57% - High**

## EMS Training

- ✅ **Accreditation of emergency medicine as a medical specialty**
- ✅ **Regulations requiring to complete an accredited EMS training program**
- ✅ **Existing register of EMS professionals at a local or national level**
- ✅ **Training in crisis and disaster management included in EM curriculum[2]**

**Institutions ensuring pre-service EMS education for specialties/professions**
- ☐ First-responders degree programs
- ☑ Technical schools and community colleges
- ☑ Medical colleges / Nurse Schools (medium education institutions)
- ☐ Medical Universities
- ☐ Public Health Schools
- ☐ Other institutions

## EMS Communications

**Public Access**

- ✅ **National Numbering Plan in force**
- ✅ **Single emergency number to access all emergency services**
  999 (All Emergencies - Fire, Police, EMS)
- ✅ **Single emergency number or other emergency numbers free of charge**

- ✅ **Ability to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network**

**Other communication technologies used to contact EMS:**
  NA/NR

**Dispatch and Control**

**Category the PSAP can be attributed to**
- ☐ Referral - The PSAPs answer the phone, ask pertinent questions and then advise the calling party of the proper number to call
- ☐ Relay - The PSAP answers the phone, gets all necessary information and then relays the message to the appropriate agency
- ☐ Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call to the appropriate responding agency
- ☑ Direct - The PSAP answers the phone, gets all information from the caller, and then directly dispatches the necessary response units

- ✅ **Legal framework to regulate the activity of PSAPs and ECCs[2]**

**Type of communications technologies used at PSAP and ECC levels[2]**
- ☑ Land mobile radio systems (LMRS)
- ☑ Landline Telephone Systems
- ☑ Cellular Telephone Systems
- ☐ WIFI Systems
- ☐ IP Data Networks/Fiber Optic Connections
- ☐ Land Mobile Satellite Communications
- ☐ Other

- ✅ **PSAPs and ECCs equipped with a Computer Aided Dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)**

**Interagency Communication**

**EMS financing areas covered by regulations:**
- ☐ PSAP – all public safety agencies (fire, police, EMS, etc.)
- ☑ Communication between all public safety agencies
- ☑ First Responder team to ambulance
- ☑ First Responder team to dispatch
- ☐ First Responder to medical control
- ☐ ECC/Medical control to ambulance
- ☐ Telemetry from ambulance
- ☐ Ambulance to dispatch   ☑ Hospital to hospital
- ☑ Ambulance to ambulance   ☑ Helicopter to dispatch
- ☑ Ambulance to hospital   ☐ Ambulance to helicopter
- ☐ Hospital ED to dispatch   ☐ Helicopter to hospital

- NA/NR **Regulations in force regarding the utilization of frequencies reserved for "Emergency Medical"**
- NA/NR **Minimum technical standards for EMS to hospital communication[2]**
- ✅ **Regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)[2]**
- ✅ **The EMS pathway include Medical Control**

[1] Share of total survey questions with positive responses
  Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%

[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

## References

World Bank, The State of Emergency Medical Services (EMS) in Sub-Saharan Africa, 2021

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** Sierra Leone
**Survey completion[1]: 40% - Medium**

## EMS Standards

✓ **Right to care enshrined by Constitution or organic laws**

**Model/approaches to organize and regulate pre-hospital emergency care:**
- ☑ National system
- ☐ Local or regional systems
- ☑ Private systems
- ☐ Hospital-based systems
- ☐ Public service integrated with Civil Protection Authority
- ☐ Fire service and/or police
- ☐ Volunteer systems
- ☐ Hybrid systems

**Authority responsible for development of EMS policies and accountable for EMS system:**
NA/NR

**Leading authority in crisis/disaster response:**
Ministry of Health

**Legal requirement for EMS providers[2]**
- ☐ Accreditation
- ☐ Licensing
- ☑ Other types of authorization

NA/NR **EMS standards state that an inspection to be regularly carried out***

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NA/NR **National level operational policies and protocols applicable to all authorized EMS providers[2], or**

NA/NR **Each EMS agency/provider have its own policies[2]**

NA/NR **Requirement to submit a copy of EMS patient report to patient at the time of transfer**

NA/NR **Mechanisms in place to measure and/or monitor patient satisfaction and/or patient experience**

**Out-of-hospital triage protocols followed:**
EMS provider protocols

NA/NR **Triage policy in transporting patients applied**
- ☐ Resource-Based START
- ☐ Non-conveyance
- ☐ Other (i.e. severity of patient's clinical condition)

**Policy regarding which hospital the patient will be transported to for emergency care**
- ☐ Normative judgments: designated hospital catchment area
- ☑ Nearest emergency department with available beds
- ☐ Complex method: candidate Emergency Departments' available capacities
- ☐ Waiting times, and distances from the incident scene
- ☐ No policy in place

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NA/NR **Approved methodologies/regulations for planning and forecasting EMS personnel needs[2]**

NA/NR **Approved methodologies/regulations for planning and forecasting EMS vehicle needs[2]**

✓ **EMS vehicle staff requirements**
- ☑ Driver + 1 (1 EMT or Nurse)
- ☐ Driver + 2 (1 Basic EMT and 1 Advanced EMT)
- ☐ Driver + 2 (1 Physician and 1 Nurse or Paramedic)
- ☐ Driver + 3 (1 Physician, 1 Nurse, 1 Patient Transport Assistant)

*Governance*

*Service Delivery*

*Resources*

## EMS Financing

**EMS financing areas covered by regulations[2]**
- ☑ Healthcare funds allocation
- ☐ Coverage schemes
- ☐ Exemption policies
- ☐ Tariffs
- ☐ Fees for non-covered
- ☐ Contracting health services
- ☐ Reimbursement
- ☐ Stewardship and oversight of payer organization
- ☐ Incentivize providers for efficiency and quality care
- ☐ Provider control and audit

**Legal provisions regarding the mechanisms for allocating funds for EMS[2]**
- ☐ Ad-hoc based on current needs
- ☐ EMS budget (without specifications) for Ministries with responsibilities in the field of crisis
- ☑ Share from MoH budget

✓ **Emergency medical services provided to households and individuals free of charge**

✓ **Insurance schemes used for EMS**
Who provides the insurance schemes:
- ☑ Government and/or MoH
- ☐ Private organizations
- ☐ Employers

**How the EMS is funded**
- ☑ MoH budget
- ☐ Separate government budget from MoH
- ☑ Private sector sources only
- ☐ User pays

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** Sierra Leone

**Survey completion[1]: 40% - Medium**

## EMS Training

❌ **Accreditation of emergency medicine as a medical specialty**

✅ **Regulations requiring to complete an accredited EMS training program**

NA/NR **Existing register of EMS professionals at a local or national level**

NA/NR **Training in crisis and disaster management included in EM curriculum[2]**

**Institutions ensuring pre-service EMS education for specialties/professions**
- ☐ First-responders degree programs
- ☐ Technical schools and community colleges
- ☑ Medical colleges / Nurse Schools (medium education institutions)
- ☑ Medical Universities
- ☐ Public Health Schools
- ☐ Other institutions

## EMS Communications

✅ **National Numbering Plan in force**

NA/NR **Single emergency number to access all emergency services**

✅ **Single emergency number or other emergency numbers free of charge**

✅ **Ability to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network**

**Other communication technologies used to contact EMS:**
NA/NR

*Public Access*

**Category the PSAP can be attributed to**
- ☑ Referral - The PSAPs answer the phone, ask pertinent questions and then advise the calling party of the proper number to call
- ☐ Relay - The PSAP answers the phone, gets all necessary information and then relays the message to the appropriate agency
- ☐ Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call to the appropriate responding agency
- ☐ Direct - The PSAP answers the phone, gets all information from the caller, and then directly dispatches the necessary response units

NA/NR **Legal framework to regulate the activity of PSAPs and ECCs[2]**

**Type of communications technologies used at PSAP and ECC levels[2]**
- ☑ Land mobile radio systems (LMRS)
- ☐ Landline Telephone Systems
- ☐ Cellular Telephone Systems
- ☐ WIFI Systems
- ☐ IP Data Networks/Fiber Optic Connections
- ☐ Land Mobile Satellite Communications
- ☐ Other

✅ **PSAPs and ECCs equipped with a Computer Aided Dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)**

*Dispatch and Control*

**EMS financing areas covered by regulations:**
- ☑ PSAP – all public safety agencies (fire, police, EMS, etc.)
- ☐ Communication between all public safety agencies
- ☑ First Responder team to ambulance
- ☑ First Responder team to dispatch
- ☐ First Responder to medical control
- ☐ ECC/Medical control to ambulance
- ☐ Telemetry from ambulance
- ☑ Ambulance to dispatch
- ☑ Ambulance to ambulance
- ☑ Ambulance to hospital
- ☐ Hospital ED to dispatch
- ☐ Hospital to hospital
- ☐ Helicopter to dispatch
- ☐ Ambulance to helicopter
- ☐ Helicopter to hospital

NA/NR **Regulations in force regarding the utilization of frequencies reserved for "Emergency Medical"**

NA/NR **Minimum technical standards for EMS to hospital communication[2]**

✅ **Regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)[2]**

NA/NR **The EMS pathway include Medical Control**

*Interagency Communication*

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[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%

[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

## References

World Bank, The State of Emergency Medical Services (EMS) in Sub-Saharan Africa, 2021

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇸🇳 Senegal

**Survey completion[1]: 53% - Medium**

## EMS Standards

✅ **Right to care enshrined by Constitution or organic laws**

**Model/approaches to organize and regulate pre-hospital emergency care:**
- ☑ National system
- ☑ Local or regional systems
- ☑ Private systems
- ☑ Hospital-based systems
- ☑ Public service integrated with Civil Protection Authority
- ☑ Fire service and/or police
- ☐ Volunteer systems
- ☐ Hybrid systems

**Authority responsible for development of EMS policies and accountable for EMS system:**
EMS Center

**Leading authority in crisis/disaster response:**
Center for Sanitary Emergencies Operations

**Legal requirement for EMS providers[2]**
- ☐ Accreditation
- ☐ Licensing
- ☑ Other types of authorization

✅ **EMS standards state that an inspection to be regularly carried out***

❌ **National level operational policies and protocols applicable to all authorized EMS providers[2], or**

✅ **Each EMS agency/provider have its own policies[2]**

✅ **Requirement to submit a copy of EMS patient report to patient at the time of transfer**

NA/NR **Mechanisms in place to measure and/or monitor patient satisfaction and/or patient experience**

**Out-of-hospital triage protocols followed:**
National protocols

**Triage policy in transporting patients applied**
- ☐ Resource-Based START
- ☐ Non-conveyance
- ☑ Other (i.e. severity of patient's clinical condition)

**Policy regarding which hospital the patient will be transported to for emergency care**
- ☐ Normative judgments: designated hospital catchment area
- ☑ Nearest emergency department with available beds
- ☑ Complex method: candidate Emergency Departments' available capacities
- ☑ Waiting times, and distances from the incident scene
- ☐ No policy in place

NA/NR **Approved methodologies/regulations for planning and forecasting EMS personnel needs[2]**

NA/NR **Approved methodologies/regulations for planning and forecasting EMS vehicle needs[2]**

NA/NR **EMS vehicle staff requirements**
- ☐ Driver + 1 (1 EMT or Nurse)
- ☐ Driver + 2 (1 Basic EMT and 1 Advanced EMT)
- ☐ Driver + 2 (1 Physician and 1 Nurse or Paramedic)
- ☐ Driver + 3 (1 Physician, 1 Nurse, 1 Patient Transport Assistant)

## EMS Financing

**EMS financing areas covered by regulations[2]**
- ☑ Healthcare funds allocation
- ☑ Coverage schemes
- ☑ Exemption policies
- ☑ Tariffs
- ☑ Fees for non-covered
- ☑ Contracting health services
- ☑ Reimbursement
- ☑ Stewardship and oversight of payer organization
- ☑ Incentivize providers for efficiency and quality care
- ☐ Provider control and audit

**Legal provisions regarding the mechanisms for allocating funds for EMS[2]**
- ☐ Ad-hoc based on current needs
- ☐ EMS budget (without specifications) for Ministries with responsibilities in the field of crisis
- ☑ Share from MoH budget

NA/NR **Emergency medical services provided to households and individuals free of charge**

✅ **Insurance schemes used for EMS**
Who provides the insurance schemes:
- ☑ Government and/or MoH
- ☑ Private organizations
- ☑ Employers

**How the EMS is funded**
- ☑ MoH budget
- ☑ Separate government budget from MoH
- ☑ Private sector sources only
- ☑ User pays

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%
[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇸🇳 **Senegal**

**Survey completion[1]: 53% - Medium**

## EMS Training

✅ **Accreditation of emergency medicine as a medical specialty**

✅ **Regulations requiring to complete an accredited EMS training program**

NA/NR **Existing register of EMS professionals at a local or national level**

✅ **Training in crisis and disaster management included in EM curriculum[2]**

**Institutions ensuring pre-service EMS education for specialties/professions**
- ☑ First-responders degree programs
- ☐ Technical schools and community colleges
- ☑ Medical colleges / Nurse Schools (medium education institutions)
- ☑ Medical Universities
- ☐ Public Health Schools
- ☐ Other institutions

## EMS Communications

### Public Access

✅ **National Numbering Plan in force**

NA/NR **Single emergency number to access all emergency services**

✅ **Single emergency number or other emergency numbers free of charge**

✅ **Ability to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network**

**Other communication technologies used to contact EMS:**
NA/NR

### Dispatch and Control

**Category the PSAP can be attributed to**
- ☐ Referral - The PSAPs answer the phone, ask pertinent questions and then advise the calling party of the proper number to call
- ☐ Relay - The PSAP answers the phone, gets all necessary information and then relays the message to the appropriate agency
- ☑ Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call to the appropriate responding agency
- ☑ Direct - The PSAP answers the phone, gets all information from the caller, and then directly dispatches the necessary response units

NA/NR **Legal framework to regulate the activity of PSAPs and ECCs[2]**

**Type of communications technologies used at PSAP and ECC levels[2]**
- ☑ Land mobile radio systems (LMRS)
- ☐ Landline Telephone Systems
- ☐ Cellular Telephone Systems
- ☐ WIFI Systems
- ☐ IP Data Networks/Fiber Optic Connections
- ☐ Land Mobile Satellite Communications
- ☐ Other

✅ **PSAPs and ECCs equipped with a Computer Aided Dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)**

### Interagency Communication

**EMS financing areas covered by regulations:**
- ☑ PSAP – all public safety agencies (fire, police, EMS, etc.)
- ☑ Communication between all public safety agencies
- ☑ First Responder team to ambulance
- ☑ First Responder team to dispatch
- ☐ First Responder to medical control
- ☐ ECC/Medical control to ambulance
- ☐ Telemetry from ambulance
- ☑ Ambulance to dispatch
- ☑ Ambulance to ambulance
- ☑ Ambulance to hospital
- ☐ Hospital ED to dispatch
- ☐ Hospital to hospital
- ☐ Helicopter to dispatch
- ☐ Ambulance to helicopter
- ☐ Helicopter to hospital

NA/NR **Regulations in force regarding the utilization of frequencies reserved for "Emergency Medical"**

✅ **Minimum technical standards for EMS to hospital communication[2]**

NA/NR **Regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)[2]**

✅ **The EMS pathway include Medical Control**

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[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%

[2] Quality and comprehensiveness of regulations are not included

[3] NA/NR: Data not available or no response given

## References

World Bank, The State of Emergency Medical Services (EMS) in Sub-Saharan Africa, 2021

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇹🇿 Tanzania

**Survey completion[1]: 33% - Medium**

## EMS Standards

*Governance*

✅ **Right to care enshrined by Constitution or organic laws**

**Model/approaches to organize and regulate pre-hospital emergency care:**

- ☑ National system
- ☐ Local or regional systems
- ☐ Private systems
- ☐ Hospital-based systems
- ☐ Public service integrated with Civil Protection Authority
- ☐ Fire service and/or police
- ☐ Volunteer systems
- ☐ Hybrid systems

**Authority responsible for development of EMS policies and accountable for EMS system:**
Ministry of Health

**Leading authority in crisis/disaster response:**
Office of the Prime Minister

NA/NR **Legal requirement for EMS providers[2]**
- ☐ Accreditation   ☐ Licensing
- ☐ Other types of authorization

NA/NR **EMS standards state that an inspection to be regularly carried out***

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❌ **National level operational policies and protocols applicable to all authorized EMS providers[2], or**

✅ **Each EMS agency/provider have its own policies[2]**

NA/NR **Requirement to submit a copy of EMS patient report to patient at the time of transfer**

NA/NR **Mechanisms in place to measure and/or monitor patient satisfaction and/or patient experience**

**Out-of-hospital triage protocols followed:**
EMS provider protocols

NA/NR **Triage policy in transporting patients applied**
- ☐ Resource-Based START
- ☐ Non-conveyance
- ☐ Other (i.e. severity of patient's clinical condition)

NA/NR **Policy regarding which hospital the patient will be transported to for emergency care**
- ☐ Normative judgments: designated hospital catchment area
- ☐ Nearest emergency department with available beds
- ☐ Complex method: candidate Emergency Departments' available capacities
- ☐ Waiting times, and distances from the incident scene
- ☐ No policy in place

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*Service Delivery*

*Resources*

NA/NR **Approved methodologies/regulations for planning and forecasting EMS personnel needs[2]**

NA/NR **Approved methodologies/regulations for planning and forecasting EMS vehicle needs[2]**

❌ **EMS vehicle staff requirements**
- ☐ Driver + 1 (1 EMT or Nurse)
- ☐ Driver + 2 (1 Basic EMT and 1 Advanced EMT)
- ☐ Driver + 2 (1 Physician and 1 Nurse or Paramedic)
- ☐ Driver + 3 (1 Physician, 1 Nurse, 1 Patient Transport Assistant)

## EMS Financing

**EMS financing areas covered by regulations[2]**
- ☑ Healthcare funds allocation
- ☐ Coverage schemes
- ☐ Exemption policies
- ☐ Tariffs
- ☐ Fees for non-covered
- ☐ Contracting health services
- ☐ Reimbursement
- ☐ Stewardship and oversight of payer organization
- ☐ Incentivize providers for efficiency and quality care
- ☐ Provider control and audit

NA/NR **Legal provisions regarding the mechanisms for allocating funds for EMS[2]**
- ☐ Ad-hoc based on current needs
- ☐ EMS budget (without specifications) for Ministries with responsibilities in the field of crisis
- ☐ Share from MoH budget

NA/NR **Emergency medical services provided to households and individuals free of charge**

NA/NR **Insurance schemes used for EMS**
- ☐ Government and/or MoH
- ☐ Private organizations
- ☐ Employers

NA/NR **How the EMS is funded**
- ☐ MoH budget
- ☐ Separate government budget from MoH
- ☐ Private sector sources only
- ☐ User pays

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%
[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇹🇿 **Tanzania**

**Survey completion[1]: 33% - Medium**

## EMS Training

✅ **Accreditation of emergency medicine as a medical specialty**

✅ **Regulations requiring to complete an accredited EMS training program**

✅ **Existing register of EMS professionals at a local or national level**

🚫 **Training in crisis and disaster management included in EM curriculum[2]**

**Institutions ensuring pre-service EMS education for specialties/professions**
- ☐ First-responders degree programs
- ☐ Technical schools and community colleges
- ☑ Medical colleges / Nurse Schools (medium education institutions)
- ☑ Medical Universities
- ☐ Public Health Schools
- ☐ Other institutions

## EMS Communications

### Public Access

✅ **National Numbering Plan in force**

🚫 **Single emergency number to access all emergency services**

✅ **Single emergency number or other emergency numbers free of charge**

🚫 **Ability to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network**

**Other communication technologies used to contact EMS:**
NA/NR

### Dispatch and Control

🚫 **Category the PSAP can be attributed to**
- ☐ Referral - The PSAPs answer the phone, ask pertinent questions and then advise the calling party of the proper number to call
- ☐ Relay - The PSAP answers the phone, gets all necessary information and then relays the message to the appropriate agency
- ☐ Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call to the appropriate responding agency
- ☐ Direct - The PSAP answers the phone, gets all information from the caller, and then directly dispatches the necessary response units

🚫 **Legal framework to regulate the activity of PSAPs and ECCs[2]**

🚫 **Type of communications technologies used at PSAP and ECC levels[2]**
- ☐ Land mobile radio systems (LMRS)
- ☐ Landline Telephone Systems
- ☐ Cellular Telephone Systems
- ☐ WIFI Systems
- ☐ IP Data Networks/Fiber Optic Connections
- ☐ Land Mobile Satellite Communications
- ☐ Other

🚫 **PSAPs and ECCs equipped with a Computer Aided Dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)**

### Interagency Communication

🚫 **EMS financing areas covered by regulations:**
- ☐ PSAP – all public safety agencies (fire, police, EMS, etc.)
- ☐ Communication between all public safety agencies
- ☐ First Responder team to ambulance
- ☐ First Responder team to dispatch
- ☐ First Responder to medical control
- ☐ ECC/Medical control to ambulance
- ☐ Telemetry from ambulance
- ☐ Ambulance to dispatch
- ☐ Ambulance to ambulance
- ☐ Ambulance to hospital
- ☐ Hospital ED to dispatch
- ☐ Hospital to hospital
- ☐ Helicopter to dispatch
- ☐ Ambulance to helicopter
- ☐ Helicopter to hospital

🚫 **Regulations in force regarding the utilization of frequencies reserved for "Emergency Medical"**

🚫 **Minimum technical standards for EMS to hospital communication[2]**

🚫 **Regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)[2]**

🚫 **The EMS pathway include Medical Control**

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%

[2] Quality and comprehensiveness of regulations are not included

[3] NA/NR: Data not available or no response given

## References

World Bank, The State of Emergency Medical Services (EMS) in Sub-Saharan Africa, 2021

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇹🇬 **Togo**

**Survey completion[1]: 31% - Medium**

## EMS Standards

*Governance*

✅ **Right to care enshrined by Constitution or organic laws**

**Model/approaches to organize and regulate pre-hospital emergency care:**
- ☐ National system
- ☐ Local or regional systems
- ☐ Private systems
- ☐ Hospital-based systems
- ☐ Public service integrated with Civil Protection Authority
- ☐ Fire service and/or police
- ☐ Volunteer systems
- ☑ Hybrid systems

**Authority responsible for development of EMS policies and accountable for EMS system:**
Ministry of Health

**Leading authority in crisis/disaster response:**
Center for Sanitary Emergencies Operations

NA/NR **Legal requirement for EMS providers[2]**
- ☐ Accreditation          ☐ Licensing
- ☐ Other types of authorization

NA/NR **EMS standards state that an inspection to be regularly carried out***

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*Service Delivery*

❌ **National level operational policies and protocols applicable to all authorized EMS providers[2], or**

  ✅ **Each EMS agency/provider have its own policies[2]**

NA/NR **Requirement to submit a copy of EMS patient report to patient at the time of transfer**

✅ **Mechanisms in place to measure and/or monitor patient satisfaction and/or patient experience**

**Out-of-hospital triage protocols followed:**
EMS provider protocols

**Triage policy in transporting patients applied**
- ☐ Resource-Based START
- ☐ Non-conveyance
- ☑ Other (i.e. severity of patient's clinical condition)

**Policy regarding which hospital the patient will be transported to for emergency care**
- ☐ Normative judgments: designated hospital catchment area
- ☑ Nearest emergency department with available beds
- ☐ Complex method: candidate Emergency Departments' available capacities
- ☐ Waiting times, and distances from the incident scene
- ☐ No policy in place

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*Resources*

NA/NR **Approved methodologies/regulations for planning and forecasting EMS personnel needs[2]**

NA/NR **Approved methodologies/regulations for planning and forecasting EMS vehicle needs[2]**

✅ **EMS vehicle staff requirements**
- ☐ Driver + 1 (1 EMT or Nurse)
- ☐ Driver + 2 (1 Basic EMT and 1 Advanced EMT)
- ☑ Driver + 2 (1 Physician and 1 Nurse or Paramedic)
- ☐ Driver + 3 (1 Physician, 1 Nurse, 1 Patient Transport Assistant)

## EMS Financing

**EMS financing areas covered by regulations[2]**
- ☑ Healthcare funds allocation
- ☐ Coverage schemes
- ☐ Exemption policies
- ☐ Tariffs
- ☑ Fees for non-covered
- ☐ Contracting health services
- ☐ Reimbursement
- ☐ Stewardship and oversight of payer organization
- ☑ Incentivize providers for efficiency and quality care
- ☐ Provider control and audit

NA/NR **Legal provisions regarding the mechanisms for allocating funds for EMS[2]**
- ☐ Ad-hoc based on current needs
- ☐ EMS budget (without specifications) for Ministries with responsibilities in the field of crisis
- ☐ Share from MoH budget

NA/NR **Emergency medical services provided to households and individuals free of charge**

NA/NR **Insurance schemes used for EMS**

- ☐ Government and/or MoH
- ☐ Private organizations
- ☐ Employers

**How the EMS is funded**
- ☑ MoH budget
- ☑ Separate government budget from MoH
- ☑ Private sector sources only
- ☐ User pays

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%
[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇹🇬 Togo

**Survey completion[1]: 31% - Medium**

## EMS Training

✅ Accreditation of emergency medicine as a medical specialty

NA/NR Regulations requiring to complete an accredited EMS training program

NA/NR Existing register of EMS professionals at a local or national level

NA/NR Training in crisis and disaster management included in EM curriculum[2]

**Institutions ensuring pre-service EMS education for specialties/professions**
- ☐ First-responders degree programs
- ☐ Technical schools and community colleges
- ☐ Medical colleges / Nurse Schools (medium education institutions)
- ☑ Medical Universities
- ☐ Public Health Schools
- ☐ Other institutions

## EMS Communications

*Public Access*

✅ National Numbering Plan in force

NA/NR Single emergency number to access all emergency services

✅ Single emergency number or other emergency numbers free of charge

✅ Ability to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network

**Other communication technologies used to contact EMS:**
Mobile Applications

*Dispatch and Control*

**Category the PSAP can be attributed to**
- ☑ Referral - The PSAPs answer the phone, ask pertinent questions and then advise the calling party of the proper number to call
- ☑ Relay - The PSAP answers the phone, gets all necessary information and then relays the message to the appropriate agency
- ☑ Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call to the appropriate responding agency
- ☑ Direct - The PSAP answers the phone, gets all information from the caller, and then directly dispatches the necessary response units

**Type of communications technologies used at PSAP and ECC levels[2]**
- ☑ Land mobile radio systems (LMRS)
- ☑ Landline Telephone Systems
- ☑ Cellular Telephone Systems
- ☑ WIFI Systems
- ☐ IP Data Networks/Fiber Optic Connections
- ☑ Land Mobile Satellite Communications
- ☐ Other

✅ Legal framework to regulate the activity of PSAPs and ECCs[2]

✅ PSAPs and ECCs equipped with a Computer Aided Dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)

*Interagency Communication*

**EMS financing areas covered by regulations:**
- ☑ PSAP – all public safety agencies (fire, police, EMS, etc.)
- ☑ Communication between all public safety agencies
- ☐ First Responder team to ambulance
- ☐ First Responder team to dispatch
- ☐ First Responder to medical control
- ☑ ECC/Medical control to ambulance
- ☐ Telemetry from ambulance
- ☐ Ambulance to dispatch
- ☐ Ambulance to ambulance
- ☐ Ambulance to hospital
- ☑ Hospital ED to dispatch
- ☑ Hospital to hospital
- ☑ Helicopter to dispatch
- ☑ Ambulance to helicopter
- ☑ Helicopter to hospital

NA/NR Regulations in force regarding the utilization of frequencies reserved for "Emergency Medical"

NA/NR Minimum technical standards for EMS to hospital communication[2]

NA/NR Regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)[2]

NA/NR The EMS pathway include Medical Control

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[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%

[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

## References

World Bank, The State of Emergency Medical Services (EMS) in Sub-Saharan Africa, 2021

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇺🇬 Uganda

**Survey completion[1]: 63% - High**

## EMS Standards

**Governance**

✅ **Right to care enshrined by Constitution or organic laws**

**Model/approaches to organize and regulate pre-hospital emergency care:**
- ☑ National system
- ☑ Local or regional systems
- ☑ Private systems
- ☑ Hospital-based systems
- ☑ Public service integrated with Civil Protection Authority
- ☑ Fire service and/or police
- ☑ Volunteer systems
- ☑ Hybrid systems

**Authority responsible for development of EMS policies and accountable for EMS system:**
Ministry of Health

**Leading authority in crisis/disaster response:**
Office of the Prime Minister

**Legal requirement for EMS providers[2]**
- ☐ Accreditation
- ☐ Licensing
- ☑ Other types of authorization

✅ **EMS standards state that an inspection to be regularly carried out***

**Service Delivery**

❌ **National level operational policies and protocols applicable to all authorized EMS providers[2], or**

✅ **Each EMS agency/provider have its own policies[2]**

NA/NR **Requirement to submit a copy of EMS patient report to patient at the time of transfer**

NA/NR **Mechanisms in place to measure and/or monitor patient satisfaction and/or patient experience**

**Out-of-hospital triage protocols followed:**
EMS provider protocols

**Triage policy in transporting patients applied**
- ☑ Resource-Based START
- ☐ Non-conveyance
- ☐ Other (i.e. severity of patient's clinical condition)

**Policy regarding which hospital the patient will be transported to for emergency care**
- ☐ Normative judgments: designated hospital catchment area
- ☐ Nearest emergency department with available beds
- ☐ Complex method: candidate Emergency Departments' available capacities
- ☐ Waiting times, and distances from the incident scene
- ☐ No policy in place

**Resources**

NA/NR **Approved methodologies/regulations for planning and forecasting EMS personnel needs[2]**

✅ **Approved methodologies/regulations for planning and forecasting EMS vehicle needs[2]**

✅ **EMS vehicle staff requirements**
- ☐ Driver + 1 (1 EMT or Nurse)
- ☑ Driver + 2 (1 Basic EMT and 1 Advanced EMT)
- ☐ Driver + 2 (1 Physician and 1 Nurse or Paramedic)
- ☐ Driver + 3 (1 Physician, 1 Nurse, 1 Patient Transport Assistant)

## EMS Financing

**EMS financing areas covered by regulations[2]**
- ☑ Healthcare funds allocation
- ☑ Coverage schemes
- ☑ Exemption policies
- ☐ Tariffs
- ☑ Fees for non-covered
- ☑ Contracting health services
- ☐ Reimbursement
- ☐ Stewardship and oversight of payer organization
- ☑ Incentivize providers for efficiency and quality care
- ☐ Provider control and audit

**Legal provisions regarding the mechanisms for allocating funds for EMS[2]**
- ☐ Ad-hoc based on current needs
- ☐ EMS budget (without specifications) for Ministries with responsibilities in the field of crisis
- ☑ Share from MoH budget

✅ **Emergency medical services provided to households and individuals free of charge**

✅ **Insurance schemes used for EMS**

Who provides the insurance schemes:
- ☐ Government and/or MoH
- ☑ Private organizations
- ☑ Employers

**How the EMS is funded**
- ☑ MoH budget
- ☑ Separate government budget from MoH
- ☑ Private sector sources only
- ☑ User pays

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%
[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇺🇬 Uganda

**Survey completion[1]: 63% - High**

## EMS Training

✅ **Accreditation of emergency medicine as a medical specialty**

✅ **Regulations requiring to complete an accredited EMS training program**

✅ **Existing register of EMS professionals at a local or national level**

✅ **Training in crisis and disaster management included in EM curriculum[2]**

**Institutions ensuring pre-service EMS education for specialties/professions**
- ☑ First-responders degree programs
- ☐ Technical schools and community colleges
- ☑ Medical colleges / Nurse Schools (medium education institutions)
- ☑ Medical Universities
- ☑ Public Health Schools
- ☑ Other institutions

## EMS Communications

### Public Access

✅ **National Numbering Plan in force**

✅ **Single emergency number to access all emergency services**
912 (All Emergencies - Fire, Police, EMS)

✅ **Single emergency number or other emergency numbers free of charge**

NA/NR **Ability to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network**

**Other communication technologies used to contact EMS:**
SMS, Mobile Applications

### Dispatch and Control

**Category the PSAP can be attributed to**
- ☑ Referral - The PSAPs answer the phone, ask pertinent questions and then advise the calling party of the proper number to call
- ☐ Relay - The PSAP answers the phone, gets all necessary information and then relays the message to the appropriate agency
- ☐ Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call to the appropriate responding agency
- ☑ Direct - The PSAP answers the phone, gets all information from the caller, and then directly dispatches the necessary response units

**Type of communications technologies used at PSAP and ECC levels[2]**
- ☑ Land mobile radio systems (LMRS)
- ☑ Landline Telephone Systems
- ☑ Cellular Telephone Systems
- ☐ WIFI Systems
- ☐ IP Data Networks/Fiber Optic Connections
- ☐ Land Mobile Satellite Communications
- ☐ Other

NA/NR **Legal framework to regulate the activity of PSAPs and ECCs[2]**

NA/NR **PSAPs and ECCs equipped with a Computer Aided Dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)**

### Interagency Communication

**EMS financing areas covered by regulations:**
- ☐ PSAP – all public safety agencies (fire, police, EMS, etc.)
- ☐ Communication between all public safety agencies
- ☐ First Responder team to ambulance
- ☑ First Responder team to dispatch
- ☐ First Responder to medical control
- ☐ ECC/Medical control to ambulance
- ☐ Telemetry from ambulance
- ☑ Ambulance to dispatch
- ☐ Ambulance to ambulance
- ☑ Ambulance to hospital
- ☐ Hospital ED to dispatch
- ☐ Hospital to hospital
- ☐ Helicopter to dispatch
- ☐ Ambulance to helicopter
- ☐ Helicopter to hospital

NA/NR **Regulations in force regarding the utilization of frequencies reserved for "Emergency Medical"**

NA/NR **Minimum technical standards for EMS to hospital communication[2]**

✅ **Regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)[2]**

✅ **The EMS pathway include Medical Control**

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%

[2] Quality and comprehensiveness of regulations are not included

[3] NA/NR: Data not available or no response given

## References

**World Bank, The State of Emergency Medical Services (EMS) in Sub-Saharan Africa, 2021**

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇿🇲 Zambia

**Survey completion[1]: 60% - High**

## EMS Standards

✅ **Right to care enshrined by Constitution or organic laws**

**Model/approaches to organize and regulate pre-hospital emergency care:**
- ☐ National system
- ☐ Local or regional systems
- ☐ Private systems
- ☐ Hospital-based systems
- ☐ Public service integrated with Civil Protection Authority
- ☐ Fire service and/or police
- ☐ Volunteer systems
- ☑ Hybrid systems

**Authority responsible for development of EMS policies and accountable for EMS system:**
Ministry of Health

**Leading authority in crisis/disaster response:**
Disaster Management and Mitigation Unit

**Legal requirement for EMS providers[2]**
- ☐ Accreditation   ☑ Licensing
- ☐ Other types of authorization

✅ **EMS standards state that an inspection to be regularly carried out***

_Governance_

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✅ **National level operational policies and protocols applicable to all authorized EMS providers[2], or**

❌ **Each EMS agency/provider have its own policies[2]**

✅ **Requirement to submit a copy of EMS patient report to patient at the time of transfer**

✅ **Mechanisms in place to measure and/or monitor patient satisfaction and/or patient experience**

**Out-of-hospital triage protocols followed:**
EMS provider protocols

**Triage policy in transporting patients applied**
- ☑ Resource-Based START
- ☐ Non-conveyance
- ☑ Other (i.e. severity of patient's clinical condition)

**Policy regarding which hospital the patient will be transported to for emergency care**
- ☐ Normative judgments: designated hospital catchment area
- ☑ Nearest emergency department with available beds
- ☐ Complex method: candidate Emergency Departments' available capacities
- ☐ Waiting times, and distances from the incident scene
- ☐ No policy in place

_Service Delivery_

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✅ **Approved methodologies/regulations for planning and forecasting EMS personnel needs[2]**

NA/NR **Approved methodologies/regulations for planning and forecasting EMS vehicle needs[2]**

✅ **EMS vehicle staff requirements**
- ☐ Driver + 1 (1 EMT or Nurse)
- ☐ Driver + 2 (1 Basic EMT and 1 Advanced EMT)
- ☐ Driver + 2 (1 Physician and 1 Nurse or Paramedic)
- ☑ Driver + 3 (1 Physician, 1 Nurse, 1 Patient Transport Assistant)

_Resources_

## EMS Financing

**EMS financing areas covered by regulations[2]**
- ☑ Healthcare funds allocation
- ☑ Coverage schemes
- ☐ Exemption policies
- ☐ Tariffs
- ☐ Fees for non-covered
- ☐ Contracting health services
- ☐ Reimbursement
- ☐ Stewardship and oversight of payer organization
- ☐ Incentivize providers for efficiency and quality care
- ☐ Provider control and audit

**Legal provisions regarding the mechanisms for allocating funds for EMS[2]**
- ☐ Ad-hoc based on current needs
- ☐ EMS budget (without specifications) for Ministries with responsibilities in the field of crisis
- ☑ Share from MoH budget

✅ **Emergency medical services provided to households and individuals free of charge**

✅ **Insurance schemes used for EMS**
Who provides the insurance schemes:
- ☐ Government and/or MoH
- ☑ Private organizations
- ☐ Employers

**How the EMS is funded**
- ☑ MoH budget
- ☐ Separate government budget from MoH
- ☐ Private sector sources only
- ☐ User pays

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[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%
[2] Quality and comprehensiveness of regulations are not included
[3] NA/NR: Data not available or no response given

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** Zambia

**Survey completion[1]: 60% - High**

## EMS Training

✅ **Accreditation of emergency medicine as a medical specialty**

✅ **Regulations requiring to complete an accredited EMS training program**

✅ **Existing register of EMS professionals at a local or national level**

✅ **Training in crisis and disaster management included in EM curriculum[2]**

**Institutions ensuring pre-service EMS education for specialties/professions**
- ☐ First-responders degree programs
- ☐ Technical schools and community colleges
- ☑ Medical colleges / Nurse Schools (medium education institutions)
- ☐ Medical Universities
- ☐ Public Health Schools
- ☐ Other institutions

## EMS Communications

### Public Access

✅ **National Numbering Plan in force**

NA/NR **Single emergency number to access all emergency services**

✅ **Single emergency number or other emergency numbers free of charge**

NA/NR **Ability to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network**

**Other communication technologies used to contact EMS:**
NA/NR

### Dispatch and Control

NA/NR **Category the PSAP can be attributed to**
- ☐ Referral - The PSAPs answer the phone, ask pertinent questions and then advise the calling party of the proper number to call
- ☐ Relay - The PSAP answers the phone, gets all necessary information and then relays the message to the appropriate agency
- ☐ Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call to the appropriate responding agency
- ☐ Direct - The PSAP answers the phone, gets all information from the caller, and then directly dispatches the necessary response units

NA/NR **Type of communications technologies used at PSAP and ECC levels[2]**
- ☐ Land mobile radio systems (LMRS)
- ☐ Landline Telephone Systems
- ☐ Cellular Telephone Systems
- ☐ WIFI Systems
- ☐ IP Data Networks/Fiber Optic Connections
- ☐ Land Mobile Satellite Communications
- ☐ Other

NA/NR **Legal framework to regulate the activity of PSAPs and ECCs[2]**

NA/NR **PSAPs and ECCs equipped with a Computer Aided Dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)**

### Interagency Communication

NA/NR **EMS financing areas covered by regulations:**
- ☐ PSAP – all public safety agencies (fire, police, EMS, etc.)
- ☐ Communication between all public safety agencies
- ☐ First Responder team to ambulance
- ☐ First Responder team to dispatch
- ☐ First Responder to medical control
- ☐ ECC/Medical control to ambulance
- ☐ Telemetry from ambulance
- ☐ Ambulance to dispatch
- ☐ Ambulance to ambulance
- ☐ Ambulance to hospital
- ☐ Hospital ED to dispatch
- ☐ Hospital to hospital
- ☐ Helicopter to dispatch
- ☐ Ambulance to helicopter
- ☐ Helicopter to hospital

NA/NR **Regulations in force regarding the utilization of frequencies reserved for "Emergency Medical"**

NA/NR **Minimum technical standards for EMS to hospital communication[2]**

✅ **Regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)[2]**

NA/NR **The EMS pathway include Medical Control**

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[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%

[2] Quality and comprehensiveness of regulations are not included

[3] NA/NR: Data not available or no response given

## References

World Bank, The State of Emergency Medical Services (EMS) in Sub-Saharan Africa, 2021

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇿🇼 Zimbabwe
**Survey completion¹: 58% - High**

## EMS Standards

✅ **Right to care enshrined by Constitution or organic laws**

**Model/approaches to organize and regulate pre-hospital emergency care:**
- ☐ National system
- ☐ Local or regional systems
- ☐ Private systems
- ☐ Hospital-based systems
- ☐ Public service integrated with Civil Protection Authority
- ☐ Fire service and/or police
- ☐ Volunteer systems
- ☑ Hybrid systems

**Authority responsible for development of EMS policies and accountable for EMS system:**
Ministry of Health

**Leading authority in crisis/disaster response:**
Disaster Management and Mitigation Unit

**Legal requirement for EMS providers²**
- ☐ Accreditation
- ☑ Licensing
- ☐ Other types of authorization

✅ **EMS standards state that an inspection to be regularly carried out***

*(Governance)*

❌ **National level operational policies and protocols applicable to all authorized EMS providers², or**

✅ **Each EMS agency/provider have its own policies²**

✅ **Requirement to submit a copy of EMS patient report to patient at the time of transfer**

✅ **Mechanisms in place to measure and/or monitor patient satisfaction and/or patient experience**

**Out-of-hospital triage protocols followed:**
EMS provider protocols

**Triage policy in transporting patients applied**
- ☑ Resource-Based START
- ☐ Non-conveyance
- ☐ Other (i.e. severity of patient's clinical condition)

NA/NR **Policy regarding which hospital the patient will be transported to for emergency care**
- ☐ Normative judgments: designated hospital catchment area
- ☐ Nearest emergency department with available beds
- ☐ Complex method: candidate Emergency Departments' available capacities
- ☐ Waiting times, and distances from the incident scene
- ☐ No policy in place

*(Service Delivery)*

NA/NR **Approved methodologies/regulations for planning and forecasting EMS personnel needs²**

NA/NR **Approved methodologies/regulations for planning and forecasting EMS vehicle needs²**

✅ **EMS vehicle staff requirements**
- ☐ Driver + 1 (1 EMT or Nurse)
- ☐ Driver + 2 (1 Basic EMT and 1 Advanced EMT)
- ☑ Driver + 2 (1 Physician and 1 Nurse or Paramedic)
- ☐ Driver + 3 (1 Physician, 1 Nurse, 1 Patient Transport Assistant)

*(Resources)*

## EMS Financing

**EMS financing areas covered by regulations²**
- ☑ Healthcare funds allocation
- ☑ Coverage schemes
- ☑ Exemption policies
- ☑ Tariffs
- ☑ Fees for non-covered
- ☐ Contracting health services
- ☐ Reimbursement
- ☐ Stewardship and oversight of payer organization
- ☐ Incentivize providers for efficiency and quality care
- ☐ Provider control and audit

**Legal provisions regarding the mechanisms for allocating funds for EMS²**
- ☐ Ad-hoc based on current needs
- ☐ EMS budget (without specifications) for Ministries with responsibilities in the field of crisis
- ☑ Share from MoH budget

✅ **Emergency medical services provided to households and individuals free of charge**

✅ **Insurance schemes used for EMS**
Who provides the insurance schemes:
- ☑ Government and/or MoH
- ☑ Private organizations
- ☑ Employers

**How the EMS is funded**
- ☑ MoH budget
- ☑ Separate government budget from MoH
- ☑ Private sector sources only
- ☑ User pays

¹ Share of total survey questions with positive responses
  Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%
² Quality and comprehensiveness of regulations are not included
³ NA/NR: Data not available or no response given

# EMERGENCY MEDICAL SERVICES COUNTRY PROFILE

**Country:** 🇿🇼 **Zimbabwe**

**Survey completion[1]: 58% - High**

## EMS Training

✅ **Accreditation of emergency medicine as a medical specialty**

✅ **Regulations requiring to complete an accredited EMS training program**

✅ **Existing register of EMS professionals at a local or national level**

NA/NR **Training in crisis and disaster management included in EM curriculum[2]**

**Institutions ensuring pre-service EMS education for specialties/professions**
- ☐ First-responders degree programs
- ☐ Technical schools and community colleges
- ☑ Medical colleges / Nurse Schools (medium education institutions)
- ☑ Medical Universities
- ☐ Public Health Schools
- ☑ Other institutions

## EMS Communications

**Public Access**

✅ **National Numbering Plan in force**

✅ **Single emergency number to access all emergency services**
112 (All Emergencies - Fire, Police, EMS)

✅ **Single emergency number or other emergency numbers free of charge**

✅ **Ability to make a basic telephone call to an emergency service on any terminal that supports outgoing calls to the public network**

**Other communication technologies used to contact EMS:**
NA/NR

**Dispatch and Control**

**Category the PSAP can be attributed to**
- ☐ Referral - The PSAPs answer the phone, ask pertinent questions and then advise the calling party of the proper number to call
- ☐ Relay - The PSAP answers the phone, gets all necessary information and then relays the message to the appropriate agency
- ☑ Transfer - The PSAP answers the phone, asks pertinent questions and transfers the call to the appropriate responding agency
- ☐ Direct - The PSAP answers the phone, gets all information from the caller, and then directly dispatches the necessary response units

✅ **Legal framework to regulate the activity of PSAPs and ECCs[2]**

**Type of communications technologies used at PSAP and ECC levels[2]**
- ☐ Land mobile radio systems (LMRS)
- ☑ Landline Telephone Systems
- ☑ Cellular Telephone Systems
- ☑ WIFI Systems
- ☐ IP Data Networks/Fiber Optic Connections
- ☑ Land Mobile Satellite Communications
- ☐ Other

✅ **PSAPs and ECCs equipped with a Computer Aided Dispatch (CAD) system and/or Advanced Medical Priority Dispatch System (AMPDS)**

**Interagency Communication**

**EMS financing areas covered by regulations:**
- ☑ PSAP – all public safety agencies (fire, police, EMS, etc.)
- ☑ Communication between all public safety agencies
- ☑ First Responder team to ambulance
- ☐ First Responder team to dispatch
- ☐ First Responder to medical control
- ☑ ECC/Medical control to ambulance
- ☐ Telemetry from ambulance
- ☑ Ambulance to dispatch
- ☑ Ambulance to ambulance
- ☑ Ambulance to hospital
- ☑ Hospital ED to dispatch
- ☐ Hospital to hospital
- ☐ Helicopter to dispatch
- ☐ Ambulance to helicopter
- ☐ Helicopter to hospital

NA/NR **Regulations in force regarding the utilization of frequencies reserved for "Emergency Medical"**

NA/NR **Minimum technical standards for EMS to hospital communication[2]**

✅ **Regulations regarding the communication equipment (primary and back-up) requirements an EMS vehicle (by class/category)[2]**

NA/NR **The EMS pathway include Medical Control**

[1] Share of total survey questions with positive responses
Low: R < 30%; Medium: 30% < R < 55%; High: R > 55%

[2] Quality and comprehensiveness of regulations are not included

[3] NA/NR: Data not available or no response given

## References

World Bank, The State of Emergency Medical Services (EMS) in Sub-Saharan Africa, 2021

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