CHAPTER 03

REVIEW OF LITERATURE
3.1 Since the Nineteen Seventies (1970s), the mode of emergency health care delivery in pre-hospital environment evolved around two main models of EMS based on philosophy of Pre-hospital care of delivery with distinct features. These are:

- The Anglo-American Model.
- The Franco-German Model.

Today most countries across the globe have adopted a combination of each model.

3.1.1 The Anglo-American model of EMS delivery is based around “scoop and run” philosophy. The aim of this model is to rapidly bring patients to the hospital with less pre-hospital interventions. It is usually allied with public safety services such as police or fire departments rather than public health services and hospitals.

3.1.1.1 Trained paramedics and Emergency Medical Technicians (EMTs) run the system. It relies heavily on land ambulance and less so on aero-medical evacuation or coastal ambulance. In countries following this model, emergency medicine is well-developed and generally recognized as a separate medical specialty. Almost all patients in the Anglo-American model are transported by EMS personnel to developed Emergency Departments rather than hospital wards.

Countries such as the United States America, Canada, New Zealand, South Africa, Hong Kong, Singapore, Pakistan, Afghanistan, Bangladesh, Sudan and Nepal follow the Anglo-American EMS systems.

3.1.2 The Franco-German model of EMS delivery is based on the “stay and stabilize” philosophy. The aim of this model is to bring the hospital to patients. It is usually run by physicians and they have extensive scope of practice with very advanced technology at hand. The model utilizes more of other methods of transportations alongside land ambulance such as helicopters and coastal ambulances.

This model is usually a sub-set of the wider health care system.

Therefore in Europe pre-hospital emergency care is almost always provided by emergency physicians.
The attending emergency doctors in the field have the authority to make complex clinical judgment and treat patients in their homes or at the scene.

3.1.2.1 This results in many EMS users being treated at the site of incident and less being transported to hospitals. The very few transported patients are usually directly admitted to hospital wards by the attending field emergency medicine physician bypassing the emergency department. Countries such as the United Kingdom, Germany, France, Sri Lanka and Kenya follow the Franco-German EMS systems.
TABLE NO. 2

Comparison between Anglo - American model and Franco - German model of EMS delivery.

<table>
<thead>
<tr>
<th>Description</th>
<th>Anglo American Model</th>
<th>Franco German Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Patients</td>
<td>Few treated on scene</td>
<td>More treated on scene</td>
</tr>
<tr>
<td></td>
<td>More transported to hospitals</td>
<td>Few transported to hospitals</td>
</tr>
<tr>
<td>Provider of care</td>
<td>Paramedics with medical oversight</td>
<td>Medical doctors supported by Paramedics</td>
</tr>
<tr>
<td>Aim</td>
<td>Brings the patient to the hospital</td>
<td>Brings the hospital to the patient</td>
</tr>
<tr>
<td>Destination for</td>
<td>Direct transport to Emergency Departments</td>
<td>Direct transport to hospital wards bypassing Emergency Department</td>
</tr>
<tr>
<td>transported patients</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization</td>
<td>EMS is a part of public safety organization</td>
<td>EMS is part of public health organization</td>
</tr>
</tbody>
</table>
3.1.3 While both systems have the same principal mission when delivering emergency care for trauma and life-threatening illnesses, they differ when delivering non-life threatening care and schedule to transport of stable cases.

3.1.4 The Franco-German Model uses primary care options other than transporting patients to Emergency Departments extensively more than the Anglo-American system. If to be transported, patients in Europe are usually escorted directly to a hospital floor where the attending field emergency physician believes condition will benefit more by direct admission unlike the American model where all admissions have to go through emergency department.

   Many studies have attempted to compare the two systems in terms of outcome or cost-effectiveness. However, it seems that they are not really comparable because they tend to operate in different contexts with different types of demands to meet.

3.1.5 Also the lack of unified standards between the two models makes comparison an unjustifiable exercise. Thus there is currently no evidence that one model is better than the other and studies continue to show conflicting conclusions. Rather than the issue of which model is best, there is the question of which organization in the community should provide EMS.
3.2 Emergency Medical Services in the United States of America provide out-of-hospital / pre-hospital acute medical care and/or transport to definitive care for those in need. Services are regulated at the most basic level by the Federal government which sets the minimum standards that all state EMS providers must meet and regulated more strictly by individual state governments which often require higher standards from the services they oversee.

There is significant variation between the Emergency Medical Services provided in one state from those provided in another.⁹

3.2.1 Model of care

The Emergency Medical Service system in the United States follows the Anglo-American model of care.¹⁰

3.2.2 Emergency Access number

Nine–one-one (9-1-1) is the emergency telephone number for the North American Numbering Plan (NANP).

The use of this number is for emergency circumstances only, and to use it for any other purpose (including non-emergency situations and prank calls) is a crime.¹¹

The number works for all three emergency services. In most cases a Nine–One-One (9-1-1) call will be answered at a central facility usually referred to as a ‘Public Safety Answering Point’ and operated in most cases by the police. The needs of the caller are identified and the call is routed to the dispatcher for the emergency service(s) required.

While some small communities continue to use 'low-tech' approaches to dispatch in many places in the U.S. the technology is quite advanced.

Advanced technologies in use may include electronic mapping, Global
Positioning System (GPS) or Automatic vehicle location (AVL).

The use of decision support software such as Advanced Medical Priority Dispatch Services (AMPDS) is also common as are surveillance 'addons'.

3.2.3 Response time

There is no official Federal or State standard for optimum response times in the United States.\textsuperscript{12} Response time standards frequently do exist in the form of contractual obligations between communities and EMS provider organizations. However there is typically considerable variation between standards in one community and another. New York City, for example, mandates a 10 minute response time on emergency calls, while some communities in California have moved response time standards to twelve-fifteen (12–15) minutes.\textsuperscript{13}

It is generally accepted within the field that an 'ideal' response time for emergency calls would be within eight minutes,

3.2.4 Locating callers automatically

In over 98\% of locations in the United States dialing Nine-One-One ("911") from any telephone will link the caller to an emergency dispatch center called Public Safety Answering Point (PSAP), by the telecom industry which sends emergency responders to the caller's location in an emergency.

3.2.4.1 In most areas approximately 96\% of the USA, enhanced Nine-One-One (911) is available, which automatically provides the dispatch center the caller's location, if available.\textsuperscript{14} Enhanced Nine-One-One (9-1-1) or E Nine-One-One (9-1-1) service is a North American telecommunications-based system that automatically associates a physical address with the calling party's telephone number and routes the call to the most appropriate Public Safety Answering Point (PSAP) for that address. The caller’s address and information (as recorded by the telephone company) are displayed to the PSAP call taker immediately upon the receipt of the call by the PSAP staff.
3.2.4.2 This provides emergency responders with the location of the emergency without the person calling for help having to provide it. This is often useful in cases of fires, break-ins, kidnapping and other events where communicating one's location may be difficult or impossible.

3.2.4.3 In North America, the system works only if the emergency telephone number Nine-One-One (9-1-1) is called. Calls made to other telephone numbers, even though they may be listed as an emergency telephone number, may not permit this feature to function correctly.\textsuperscript{14}

3.2.5 Training

3.2.5.1 Emergency medical responder (EMR):

EMR is a basic qualification level who is volunteers, render very basic first aid including oxygen administration to patients. An EMR can assume care for a patient while that patient is being transported.\textsuperscript{15}

3.2.5.2 Emergency Medical Technician (EMT):

An EMT is a person who has been certified (or licensed in some states) to provide a stated level of care based on written protocols. However, an EMT may be divided into several groups based on their level of certification and permitted skills:

- EMT Basic (EMT-B)
- EMT Intermediate (EMT-I) (Some states no longer recognize this as a certification level.)
- EMT Paramedic (EMT-P)

EMTs other than EMT-Bs are typically identified based on their level of certification. For example an EMT-P is generally called a paramedic in the field, and not an EMT. The title EMT, when used alone, therefore generally refers to an EMT-B.
In addition to the Paramedic level, Critical Care Paramedics specialize in the management of critical trauma and medical patients during interfacility ground and aeromedical transports.

3.2.5.3 There are at least forty (40) types of certification for EMS personnel within the United States and many of these are recognized by no more than a single state. This creates significant challenges for the career mobility of many EMS providers, as they must often re-sit certification examinations each time they move from one state to another.

3.2.5.4 EMS providers work under the authority and indirect supervision of a medical director or board-certified physician who oversees the policies and protocols of a particular EMS system or organization. Both the medical director and the actions he or she undertakes are often referred to as "Medical Control".\(^{16}\)

3.2.5.5 Equipment and procedures are necessarily limited in the pre-hospital environment and EMS professionals are trained to follow a formal and carefully designed decision tree (more commonly referred to as a "protocol") which has been approved by Medical Control. This protocol helps ensure a consistent approach to the most common types of emergencies the EMS professional may encounter.\(^{16}\)

3.2.6 Ambulances

Ambulances in the United States are defined by federal KKK - One-Eight-Two-two (KKK-1822) Standards requirements, which define several categories of ambulances. In addition, most states have additional requirements according to their individual needs.\(^{17}\)

- Type I Ambulances are based on the chassis-cabs of light duty pickup-trucks.
- Type II Ambulances are based on modern passenger/cargo vans.
- Type III Ambulances are based on chassis-cabs of light duty vans.

Additional Duty versions of both Type I and Type III designs are also defined. They include increased storage and load capacity.
3.2.6.1 Ambulances may be supplemented or supported by vehicles that lack the capacity to transport a patient. The most common of these vehicles is known by several names including 'Response Car'. Response cars are often equipped with much of the same equipment carried by an ambulance but since they are large cars, they are often faster and nimbler.

3.2.6.2 Response cars are staffed by one or more medical providers and are used as a source of additional (or more skilled) manpower as a supervisor's vehicle or as a first response vehicle, enabling medical treatment to begin before the arrival of the ambulance.

3.2.6.3 Land Ambulance

Land Ambulance services in the United States may be directly operated by the community or they may be operated by a third-party provider such as a private company.

3.2.6.4 Air Ambulance

Air ambulance services in the United States are operated by a variety of sources. Some services are hospital-operated while others are operated by the Federal, State or local government, or through a variety of departments including local or State police, the United States Park Service or Fire Departments. Such services are operated directly by any of these EMS systems or they may be contracted to a third-party provider such as an aircraft charter company.

3.2.6.5 Ambulances in the United States must be staffed with a minimum of 2 personnel. The level of crew certification varies depending on the jurisdiction the ambulance is operating. In most areas the bare minimum is an EMT-Basic to provide patient care and a First Responder to assist and drive the unit.

3.2.6.6 This set-up would be classified as a Basic Life Support Unit (BLS) due to the fact that the highest ranking provider cannot perform Advanced Life Support (ALS) interventions. If patient condition warrants, an ALS provider is summoned to assist and meet the ambulance en-route to the hospital. Other staffing combinations include One EMT-Basic and One Paramedic (the most common arrangement) or Two Paramedics which is classified in most areas as an Advanced Life Support Unit (ALS).
### 3.2.7 Funding

EMS system is funded directly by the municipality it services. The services themselves are provided by a local government and are the responsibility of the regional (or state) government. Municipality-operated services is funded by service fees and supplemented by property taxes. In many such cases the EMS system is considered to be too small to operate independently and is organized as a branch of another municipal department such as the Public Health department.  

Nine-One-One (9-1-1) and enhanced Nine-One-One (9-1-1) are typically funded based on state laws that impose monthly fees on local and wireless telephone customers.
3.3 Emergency medical services in New Zealand are operated by two organizations and served by three dispatch centers located in Auckland, Wellington and Christchurch. The dispatch center in Auckland provides coverage for the north half of North Island and is also operated by St. John Ambulance. The dispatch center in Wellington provides coverage for the southern half of the North Island and is jointly operated by Wellington Free Ambulance and St John Ambulance but is staffed by Wellington Free Ambulance personnel. The dispatch center in Christchurch provides coverage to the entire South Island, and is operated by St. John Ambulance. All three dispatch centers collaborate and are capable of handling overflow of call volume for and from one another. The call center technology is fully integrated and seamless, providing a single, 'virtual' national dispatch center.

3.3.1 Models of care

The Emergency Medical Service system in New Zealand follows Anglo-American model of care.

3.3.2 Emergency Access Number

The national emergency access number in New Zealand is One-One-One (1-1-1).

3.3.3 Response Time

Response time standards to Emergency Call in New Zealand are 12-15 minutes.

3.3.4 Training

Training occurs across a broad range in New Zealand and the range of training varies considerably between volunteer and paid staff. As a result it is permissible to work on an ambulance with only a first aid certificate or with a university degree in para-medicine.

3.3.4.1 Basic and Intermediate
When entering into the St John Ambulance Service First Responder certification or Qualification (Ambulance Officer) is essential. The more advanced role of Ambulance Officer requires a National Diploma in Ambulance Practice (Level Five) and continuing clinical education (CCE) to maintain an authority to practice. Their scope also includes drugs therapies and more advanced interventions. The EMT role is considered to be the equivalent of the international Basic Life Support (BLS) and is the minimum for a paid employment position. The next step up from BLS is the Intermediate Life Support (ILS) role.

### 3.3.4.2 Paramedic

Paramedics in New Zealand are graduates of a recognized three year program (minimum) Bachelor of Health Sciences (Paramedic) degree or Advanced Life Support (ALS). This level of qualification was pioneered by Wellington Free Ambulance in cooperation with Victoria University in Melbourne, Australia, but now reaches across New Zealand.24

### 3.3.4.3 Intensive Care Paramedics

Paramedics at this level require post-graduate education and administer an increased range of resuscitation drugs. They also perform a broad range of patient care resuscitation skills.

All levels from BLS to ALS are required to supplement their personal training with structured continuing clinical education (CCE) to maintain their ability to practice.24

### 3.3.5 Ambulance

#### 3.3.5.1 Land ambulance

Land ambulance services are provided primarily by three organizations; Wairarapa District Health Board, Wellington Free Ambulance and St John Ambulance New Zealand. St. John Ambulance provides service to approximately 88 percent (after taking over Taranaki) of the population of New Zealand, through a network of Five-Five-Three (553) ambulances and One Eight Three (183) ambulance stations.25
3.3.5.2 Wellington Free Ambulance (WFA) provides service to twelve percent of the country, only in the Wellington region. WFA operates eight ambulance stations, all in the lower half of the North Island of New Zealand, providing service to more than four lakh sixty thousand (460,000) residents. They respond to an estimated forty thousand (40,000) calls per year.²⁵

3.3.5.3 Air ambulance

Air ambulance and helicopter rescue services are vital life lines in a country which is largely rural and made up of islands. In both cases the service is provided by means of a corporate sponsor, government subsidy, public donations and the cooperation of the two land ambulance services.

Westpac is a large banking corporation operating in both Australia and New Zealand. In New Zealand, Westpac undertook sponsorship of local rescue helicopters in cooperation with local Emergency medical services. In New Zealand both operations occur under the business name 'Life Flight'.

3.3.5.4 Military

The New Zealand Defense Force has personnel and equipment available at short notice to assist in civilian matters including medical emergencies.²⁶

3.3.6 Funding

EMS consists of both volunteers and paid staff and is subsidized by the government of New Zealand through National Ambulance Sector Office (NASO) a government department combining the Ministry of Health and the Accident Compensation Corporation. Additional funding occurs by means of some billing for services to individuals (except Wellington Free) as well as by means of voluntary donations.²⁶
3.3.6.1 Both services St John Ambulance in New Zealand and Wellington Free Ambulance - have a history of long service to their communities with Wellington Free service being operational since 1927 and St John since 1885.\textsuperscript{26}
In Canada, responsibility for Emergency Medical Services as a part of health care in general has been allocated to the provincial/territorial level of government. With the exceptions of British Columbia and Alberta, which operate its EMS services directly, the methods used for service delivery vary to some degree across jurisdictions. 

Typically the provincial/territorial government provide enabling legislation, technical standard, accreditation or licensing and oversight to a variety of potential system operators, including municipalities, hospitals, or private companies. Municipalities or hospitals also in turn elect to provide EMS service directly as a branch of another municipal department, such as the fire department or health department or contract out this responsibility to a private company.

The approaches used for service delivery are governed by what is permitted under the legislation of the individual province or territory or under the by-laws of a local municipality, when that municipality accepts responsibility for EMS service. Provincial governments also as in the case of the provinces of New Brunswick Nova Scotia and Prince Edward Island contract directly with a single private company Medavie EMS (the same one in these three cases) to provide seamless province-wide services.

Canadian provinces are also served by air ambulance services. These arrangements come in a variety of forms including direct service provision, contracts between private companies and the provincial government or they may be 'brokerage' arrangements in which one private company takes the lead on service provision, perhaps even operating some of their own aircraft and providing dispatch services but subcontracting many of the operations to smaller air charter services.

The Emergency Medical Service system in Canada follows the Anglo-American Model of Care.
3.4.3 Emergency Access Number:-
Nine-One-One (9-1-1) is the number to dial in the event of an emergency.

Nine-One-One (9-1-1) is the emergency telephone number for the
North American Numbering Plan (NANP).29

3.4.3.1 The use of this number is for emergency circumstances only, and to use it for any other
purpose (including non-emergency situations and prank calls) is a crime. In Canada, fee for
service structure is regulated by the federal Canadian Radio Television and Telecommunications
Commission (CRTC).30

3.4.3.2 Depending on the location, countries and cities may also levy a fee which may be in
addition to or in lieu of the state fee. The fees are collected by local telephone and wireless
carriers through monthly surcharges on customer telephone bills.

3.4.3.3 The collected fees are remitted to Nine-One-One (9-1-1) administrative bodies, which
may be statewide Nine-One-One (9-1-1) boards, state public utility commissions, state revenue
departments or local Nine-One-One (911) agencies.30

These agencies disburse the funds to the Public Safety Answering Points
(PSAP) for Nine-One-One (9-1-1) purposes as specified in the various
statutes.

In Canada fee for service structure is regulated by the Federal Canadian
Radio Television and Telecommunications Commission (CRTC).30

3.4.4 Response time

Canada is such a diverse country with thirteen (13) separate jurisdictions governing EMS
operations that no single standard for response time measurement currently exists. Urban areas
such as Toronto will set standards according to percentiles. In this case the standard is eight
minutes and fifty nine seconds or less.

There is no jurisdiction in Canada that is currently reporting successful
achievement of this response time standard and services cite a variety
of reasons for this failure but continue to aspire to the standard.31
3.4.5 Training
A certified first responder is a person who has completed a course and received certification in providing pre-hospital care for medical emergencies. They have more skill than someone who is trained in basic first aid but they are not a substitute for advanced medical care rendered by emergency medical technicians (EMTs), emergency physicians, nurses or paramedics. "Certified first responder" refers to the first medically trained responder to arrive on scene (police, fire, EMS). Most police officers and all professional firefighters in the US, Canada and many other countries are certified first responders.

This is the required level of training. Some police officers and firefighters take more training to become EMTs or paramedics. 32

3.4.5.1 Certified First Responders in Canada
Many options are available in order to become a certified First Responder in Canada. Courses are offered by many sources including the Canadian Red Cross, St. John Ambulance and the Department of National Defense. Certified First Responder courses in Canada are separated into either "First Responder" or "Emergency Medical Responder" level courses.

3.4.5.2 "First Responder" level course is usually of forty hours in duration and is considered the minimum level of training for crews providing medical standby at events as well as for employment with some private stable transport companies that provide inter-hospital transfer for patients in need of a bed, but for patients who are stable and do not require advanced medical care.

3.4.5.3 "Emergency Medical Responder" (EMR) level courses meet the Paramedic Association of Canada's National Occupational Competency Profile and those who receive certification at this level can work for Emergency Medical Services in some Provinces. 33
3.4.5.4 Limitations of Certified First Responders:

While all Certified First Responders in Canada are covered under Good Samaritan laws in jurisdictions where they are enacted, in some cases they have a Duty to Act. Certified First Responders who are providing medical coverage to events (such as St. John Ambulance's Patient Care Divisions at community events) as well as those who are employed by Volunteer Fire Departments, Campus Response Teams and others who are required to perform Emergency Medical Response as part of their duties all have a Duty to Act.

3.4.5.5 While Certified First Responders in general are not required to render aid to injured/ill persons, those who work in the aforementioned areas can be accused of and prosecuted for negligence if they fail to respond when notified of a medical emergency if their care does not meet the standard to which they were trained or their care exceeds their scope of practice and causes harm to the patient. As with all medically trained and certified persons, Certified First Responders are immune to successful prosecution if assistance was given in good faith up to and not beyond the limits of certification and training.

3.4.5.6 Paramedics in Canada

In Canada the scope of practice of Paramedics is described by the National Occupational Competency Profile (NOCP) for Paramedics document developed by the Paramedic Association of Canada. Most providers that work in ambulances will be identified as 'Paramedics'. However in many cases the most prevalent level of emergency pre-hospital care is that which is provided by the Emergency Medical Responder (EMR).

This is a level of practice recognized under the National Occupational Competency Profile although unlike the next three successive levels of
practice, the EMR is not specifically considered a Paramedic.

3.4.5.7 Paramedic training in Canada is intense as paramedics are seen as health professionals equal in importance to nurses, respiratory therapists, cardiac percussionists and others. Nevertheless the nature of training and how it is regulated like actual paramedic practice varies from province to province.

Training varies regionally for example the Primary Care Paramedic training may be six months (British Columbia) to three years (Quebec) in duration.  

3.4.6 Ambulances

Ambulances types in Canada are based on United States federal KKK-1822 Standards requirements:  

- Type I Ambulances are based on the chassis-cabs of light duty pickup-trucks.
- Type II Ambulances are based on modern passenger/cargo vans.
- Type III Ambulances are based on chassis-cabs of light duty vans.  

3.4.7 Funding EMS services in Canada are generally funded, at least in part, and to varying degrees, by the government of the province or territory in which they operate through the Ministry of Health or Health Department of that level of that government.
EMERGENCY MEDICAL SERVICES IN GERMANY

3.5 Emergency Medical Service in Germany is a service of public pre-hospital emergency healthcare, including (but not limited to) ambulance service, provided by individual German cities and counties.\textsuperscript{42}

3.5.1 Model of Care

The Emergency Medical Service system in Germany follows Franco- German Model of care.\textsuperscript{42}

3.5.2 Emergency Access Number

The nationwide emergency number for the emergency medical services in Germany is One-One-Two (112). This number can be called either form landline or mobile. \textsuperscript{42}

3.5.2.1 As in many other places in Germany the EMS system performs two major functions:

- Emergency Services - Responding to all calls concerning immediate danger to the life and/or health of a person. This service addresses acute onset illness and injury conditions such as myocardial infarction or accidents with severe injuries.
- Non-Emergency Services - Arranging and performing the transport of non-emergency patients (i.e. transfer to from and between hospitals). Providing service to non-ambulatory patients with low-acuity or chronic conditions, or to those who are recovering from acute care situations, and who lack the ability to use other means of transport (i.e. by taxi, own car or public transport).

3.5.2.2 In addition to regular emergency and non-emergency services, there are Mobile Intensive Care Units (MICU) stationed in most of the major cities. These units correspond to the Critical Care transport function found in other places. They are brought into action whenever a patient with a serious and complex medical condition requiring advanced levels of support during transit needs to be transferred between hospitals. This service usually applies to intensive-care unit patients.
3.5.3 Training

There are only two major qualifications in German EMS, one being the physician/ EMS physician Field Responder and the other being the German Ambulance Paramedical Assistant.  

- Physician or Emergency Medical Service Physician Field Responder.

3.5.3.1 He must be a Physician with a post-graduate certification. Having a formal medical specialty field (i.e. surgery) is not required, however a minimum term of residency and additional training following medical school is required in order to obtain this certification.

- German Ambulance Paramedical Assistant

3.5.3.2 The German Ambulance Paramedical Assistant in most parts of Germany is only allowed to practice ALS under the direct supervision of a Doctor. Literally, the term means "rescue assistant". Program consists of one year theory and two months of “on job” clinical training.

In the German system, not only paramedics but also physicians have recognized roles and skill levels.

3.5.4 Ambulance Services

3.5.4.1 Land Ambulance

The German EMS system's vehicles come in a wide variety of shapes and sizes. All of its vehicles must conform to most aspects of the requirements of European standard CEN 1789 as reflected in the German standard DIN EN 1789 (types A-C) or German standard DIN 75079.

3.5.4.2 The three major types of vehicle are:

- Van-type ambulance used for non-emergency transport. It conforms to DIN EN 1789-A1/A2: "Patient Transport Ambulance single/multiple patient"
- Larger van used for emergencies. It conforms to DIN EN 1789-C "Mobile Intensive Care Unit"
Station wagon or small van. Its purpose is to bring the emergency doctor to the scene of the emergency, when required. It conforms to DIN 75079.

3.5.4.3 Air Ambulance

Germany has a well-developed air ambulance network, operated in cooperation between Germany's largest automobile club ADAC and DRF. ADAC currently operates about thirty five helicopter ambulances strategically located around Germany, whereas the DRF operates close to fifty aircraft at twenty eight stations.\(^{43}\)

3.5.4.4 Staging and deploying resources

There are two different strategies used in dispatching EMS vehicles in Germany; the Rendezvous system and the Station system.

3.5.4.5 MICU Rendezvous system

In this model, the emergency ambulance (RTW) and Doctor's car (NEF) are not necessarily co-located. In most emergencies, only the ambulance is deployed for providing patient care and transport. However, when the situation on scene is of a more severe nature, the ambulance crew can radio in for support by a physician and the NEF will be deployed. There are some medical situations where the NEF will be deployed automatically, those are usually pediatric emergencies, patients who are unconscious, mass-casualty incidents and situations where the need for analgesics and anesthetics is foreseeable.

The advantage of this system is the fact that the physician is available for other emergencies, while the ambulance crew can handle minor cases on their own.

3.5.4.6 Station system

In this system, the physician on duty will actually staff the ambulance and will be deployed to any serious medical case. The advantage with this approach lies in the ability to perform more difficult tasks without delay, however on most calls the presence of the physician is not actually required.\(^{44}\)
3.5.5 Funding

In Germany EMS is primarily financed by the German health insurance companies. In Germany the individual German states are legally responsible for the provision of emergency services, but typically delegate these responsibilities to the individual community level.

Municipalities, including both smaller communities and cities are given responsibility by the State for equipping and operating fire departments.

German law mandates the provision of fire and rescue services, including EMS, staffing and equipping according to levels which correspond to local population. In cities, this is usually provided directly by the Fire Prevention Bureau (sometimes called "Amt 37").

3.5.5.1 In Germany, EMS is a component of one of the key tasks (public safety) which every municipal government is required by law to perform. As a result, there are strict regulations regarding qualifications, job performance, EMS system performance including response time, and the types of vehicles and equipment required. EMS services are free of charge for people with Insurance.

3.5.5.2 Germany has two types of health insurance:

- Law-enforce Health Insurance
- Private Health Insurance

Eighty five percent of population is covered by basic health insurance plan provided by statue and fifteen percent opt for private insurance.
3.6 Emergency medical services in Hong Kong are provided by the Hong Kong Fire Service in cooperation with two other voluntary organizations.47

3.6.1 Model of Care
The Emergency Medical Service system in Hong Kong follows Anglo- American model of care.47

3.6.2 Emergency Access Number
The telephone number for emergency services throughout Hong Kong is Nine-Nine-Nine (999). All Nine-Nine-Nine (999) calls are answered by the Hong Kong Police Force. If an ambulance is the only response required, the call is passed directly to Hong Kong Fire Services dispatchers. If the call information is complex as with a traffic accident the police dispatchers will notify the ambulance service when they suspect that ambulances might be required. Both ambulances and fire fighting apparatus are co-dispatched by the Hong Kong Fire Service dispatchers.48

3.6.3 Response time
The objective of the Hong Kong Fire Service is to have an ambulance on the scene of an emergency within twelve minutes of receiving the request.

They are currently achieving this objective on more than ninety three percent of all emergency calls.48

3.6.4 Training
Although the Hong Kong Fire Service maintains that its ambulances provide paramedic service the current highest level of training is what most would recognize as a U.S. EMT-Intermediate level. The exact corresponding qualification is the Canadian province of British Columbia's EMA - One and Two levels. New recruits undergo twenty four weeks of training at the Hong Kong Fire Service Training Academy.49

3.6.4.1 This provides them with an enhanced Basic Life Support level of training. An additional two weeks of training is provided to motorcycle operators. Once training is completed and a
suitable amount of experience is obtained the candidate will be provided with an additional six weeks of training elevating them to the Intermediate level.

This training is conducted in cooperation with the Justice Institute of British Columbia and has been granted equivalency.  

3.6.5 Ambulances

3.6.5.1 Land Ambulance

The Hong Kong Fire Service is the statutory provider of emergency ambulance service in Hong Kong as mandated by regulations from the Legislative Council. The service has a considerable history but only amalgamated into a single unified service in 1979 when previous government ambulance operations were merged with those of the fire service.

The service employs twenty thousand two hundred people and operates approximately two hundred fifty six emergency ambulances and thirty five motorcycles from thirty six depots located strategically around Hong Kong.

The statutory service is supplemented by two organizations – St. John Ambulance, a charity organization and the Auxiliary Medical Service, a government-run voluntary service.

3.6.5.2 Air Ambulance

In Hong Kong air ambulance service is provided by the Government Flying Service, a joint service providing aviation support to all departments of the Government. While the service employs a number of different types of aircraft those used for both air ambulance service and search and rescue service are primarily of the Puma and Super-Puma types.
3.6.5.3 Vehicles
The majority of ambulances in Hong Kong are originally of British design and approximately correspond to the European Standard CEN 1789 as published by the European Committee for Standards with respect to vehicle design and equipment.\textsuperscript{52}

3.6.6 Funding
Emergency Medical Services in Hong Kong are provided by two organizations St. John – a charity organization and the Auxiliary Medical Services – a Government Voluntary Service.\textsuperscript{53}
EMERGENCY MEDICAL SERVICES IN SINGAPORE

3.7 Singapore is a cosmopolitan city state situated on an island at the crossroads of Southeast Asia. Six public hospitals provide twenty four hour accident and emergency services. In 1989 the Emergency Ambulance Services was absorbed into the Singapore Civil Defense Force (SCDF).\(^{54}\)

3.7.1 This remained a single-tier system, coordinating a fleet of sixteen ambulances, each staffed by an ambulance officer (a staff nurse trained in first-aid, cardiopulmonary resuscitation [CPR] and midwifery), an attendant (former fireman trained in first-aid and CPR) and a driver.

3.7.1.1 In 1993, marking the launch of the National Heart Save Project AED service was extended to all ambulances. Pre-hospital defibrillation protocols were developed, and regular audits are performed. Now the system transports approximately two hundred fifty cardiac arrests to Emergency Department annually.\(^{54}\)

3.7.1.2 Successful treatment of out-of-hospital cardiac arrest is now used as one of the quality indicators for the local EMS system and a group of emergency physicians and SCDF officers perform monthly quality assurance evaluations.\(^{54}\)

3.7.1.3 The Medical Advisory Council, chaired by an emergency physician, governs and endorses protocols and procedures and assures quality and standards. This council also oversees the training and operation of the emergency medical dispatchers.

3.7.2 Model of Care

The Emergency Medical Services system in Singapore follows the Anglo – American model of care.

3.7.3 Emergency Access Number

Emergency Access number in Singapore is Nine-Nine-Five (995).

All calls to Central Dispatch Controls Room are categorized into either medical or fire emergencies. Communications a vital component of any EMS system is necessary for direct medical control.\(^{12}\) Conventional
methods of verbal communication include high-frequency radio and cellular telephones.\(^5^5\)

**3.7.3.1** To improve data collection and communication, the Ministry of Health, the National Computer Board, the SCDF and Singapore General Hospital collaborated to develop a wireless information technology system to supplement existing voice links between ambulance crews and Emergency Department. The result was the Hospital and Emergency Ambulance Link (HEAL), which has been piloted on three ambulances since 1998.

**3.7.4 Training**

Paramedic training began in 1995 as collaboration between the SCDF, the School of Military Medicine and the Paramedic Academy of The Justice Institute of British Columbia.

**3.7.4.1** The program consists of three modules, completed over eighteen months. Trainees receive first aid, basic cardiac life support (BCLS) and basic trauma life support (BTLS) courses as well as supervised on-the-job clinical training. Successful program completion leads to paramedic certification, and Singapore paramedics are comparable to Canadian or US EMT.

Continuing education is an important component of paramedic training.
Refresher courses in BCLS, BTLS and AED are conducted annually.
Paramedics are encouraged to attend educational courses both locally and overseas.\(^5^5\)

**3.7.5 Ambulance Services**

SCDF ambulances strategically located at thirteen fire stations handle sixty thousand to seventy thousand emergency calls per annum. Ambulances from adjacent stations cross-cover during peak activity periods. All ambulances are equipped with basic airway, intravenous monitoring and immobilization equipment as well as an Automated Electronic Device (AED).

**3.7.5.1** In 1992 because of long ambulance response times due to traffic congestion in urban Singapore\(^8^2\) a motorcycle-based Fast Response Medic scheme (FRM) was introduced to provide care to road-traffic trauma victims. The scheme reduced response times from fifteen to eight
minutes. FRMs carry basic airway and first aid equipment, simple immobilization devices and an AED on their motorcycles. There are one or two FRMs at each of the city's thirteen fire stations. FRMs provide first-aid, CPR and AED defibrillation. They respond only to trauma cases from road accidents. Patients attended to are subsequently transported to the Emergency Department by ambulance.

3.7.6 Funding

Emergency Medical Services in Singapore is the responsibility of Ministry of Health Services Singapore Government and is managed through a Nationalized Health Plan known as Mediseave.
EMERGENCY MEDICAL SERVICES IN UNITED KINGDOM

3.8 The geography of United Kingdom (UK) is complex and multilayered. UK is a sovereign state situated to the northwest of continental Europe. UK consists of England, Northern Ireland, Scotland and Wales.

3.8.1 Emergency medical services in the United Kingdom provide immediate care to people with acute illness or injury and are predominantly provided by the publicly funded health care system, National Health Service (NHS).

3.8.2 Model of Care

The Emergency Medical Service system in United Kingdom follows Franco-German Model of Care.

3.8.3 Emergency Access Number

First introduced in the London area on 30.06.1937, the UK's Nine-Nine-Nine (999) number is the world's oldest emergency call service.

The pan-European One-One-Two (112) code was introduced in the UK in April 1995. It connects to existing Nine-Nine-Nine (999) circuits.

3.8.3.1 A valid SIM card is not required to make a 999/112 emergency call in the UK. A UK mobile telephone can dial Nine-Nine-Nine/ One-One-Two (999/112) without a SIM inserted and with the keypad locked. Both the numbers Nine-Nine-Nine and One-One-Two (999 and 112) connect to the same service and there is no priority or change for either of them. Operators have access to interpretation services covering one hundred seventy languages. Deaf people can text One-eight-zero-zero-zero (18000) for the emergency services (after registration).
3.8.4 Training

3.8.4.1 Emergency Medical Technician (EMT):

An EMT is a person who has been certified to provide a stated level of care based on written protocols. However, EMTs may be divided into several groups based on their level of certification and permitted skills as follows:

- Emergency Medical Technician (EMT) 1.
- Emergency Medical Technician (EMT) 2.
- Emergency Medical Technician (EMT) 3.
- Emergency Medical Technician (EMT) 4.

In addition, Ambulance Technicians and Assistant Ambulance Practitioners have recognized roles and skill levels.

3.8.5 Ambulance services.

Public ambulance services across the UK are required by law to respond to four types of requests for care, which are:

- Emergency calls (via the Nine-Nine-Nine (999) or One-Ione-Two (112) system).
- Doctor's urgent admission requests.
- High dependency and urgent inter-hospital transfers.
- Major incidents.

Emergency ambulance work on the guidelines published by the Joint Royal Colleges Ambulance Liaison Committee (JRCALC).

3.8.5.1 England

Device of NHS ambulance services in England and Wales
3.8.5.2 Emergency medical services are provided through local ambulance services, known in England and Wales as ‘Trusts’. Each service in England is specific to one or more local authority areas and so the country is divided across a number of ambulance services in a similar way to the police.  

In England there are twelve ambulance 'trusts' with boundaries generally following those of the regional government offices.

3.8.5.3 Scotland  
Device of the Scottish Ambulance Service

3.8.5.3.1 The Scottish Ambulance Service is a Special Health Board funded directly by the Health Department of the Scottish Government. Complementing and working alongside the Scottish Ambulance Service is the Emergency Medical Retrieval Service.

3.8.5.3.2 This unique airborne medical initiative is based at Glasgow City Heliport, staffed by consultants and uses various air assets to provide patients in remote and rural areas with rapid access to the skills of a consultant in emergency or intensive care medicine as well as facilitating transfers to larger better equipped city hospitals.

The team responds to calls twenty four hours a day utilizing both helicopters and fixed-wing aircraft. Scotland has Britain's only publicly funded Air Ambulance service.

3.8.5.4 Northern Ireland  
Device of the Northern Ireland Ambulance Service

3.8.5.4.1 The Northern Ireland Ambulance Service (NIAS) is the ambulance service that serves the whole of Northern Ireland, and was established in Nineteen Ninety Five by parliamentary order.

3.8.5.4.2 As with other ambulance services in the United Kingdom, it does not charge its patients directly for its services, but instead receives funding through general taxation. It responds to medical emergencies in Northern Ireland with the two hundred seventy plus ambulances at its disposal.
The Service employs approximately one thousand forty four staff based across thirty two stations and sub-stations, four Control Centers and a Regional Training Centre.\textsuperscript{73}

3.8.5.5 Wales

Device of the Wales Ambulance Services

3.8.5.5.1 The Welsh Ambulance Service NHS Trust was established on 01\textsuperscript{st} April, 1998, and has two thousand five hundred staff providing ambulance and related services to the 2.9 million residents of Wales.\textsuperscript{68}

3.8.5.5.2 Its headquarters is located at H. M. Stanley Hospital, St Asaph, Denbighshire and it is divided into three regions:\textsuperscript{69}

- Central and West Region based at Ty Maes Y Gruffudd, Cefn Coed Hospital, Cockett, Swansea
- North Region based at H.M.Stanley Hospital, St Asaph, Denbighshire
- South-East Region based at Vantage Point House, Ty Coch Ind Est, Cwmbran

Uniquely in the UK, The Welsh Ambulance Services NHS Trust is also responsible for the provision of NHS Direct, a nurse led telephone healthcare service which is provided by a separate Trust in England and by NHS twenty four in Scotland.

3.8.5.5.3 Measuring performance

The performance of every Ambulance Trust is measured by the government, commonly called 'ORCON' New Ambulance Performance Standards (NAPS). The Government's targets is to reach seventy five percent of Category A (life-threatening) calls.\textsuperscript{70-75}
3.8.6 Funding

Emergency Medical Services in United Kingdom is provided by one of the four National Health Services (NHS) through local ambulance services known in England and Wales as trusts. Each service in England is based on one or more local health authority areas.⁷⁶
Emergency medical services in France are provided by a mix of organizations under public health control, with the lead taken by a central control function called Urgent Medical Aid Service (SAMU).  

3.9.1 This central hub is supported by resources including first response vehicles or ambulances provided by the fire service and physician led ambulance provision from SMUR (literally translated as mobile emergency and resuscitation service) which are 'mobile intensive care units' (MICU) that have one or more physicians on board.

3.9.2 Organization

SAMU missions were defined in a law of 1986 as hospital based services providing permanent phone support, choosing and dispatching the proper response for a phone call request. The central component of SAMU is the dispatch center where a medical regulation team of physicians and assistants has the task of:

- analyzing calls to decide on patient need
- deciding the best solution for the patient's care
- dispatching the most appropriate mobile care resource (MICU) Ambulance or Mobile care professional or
- directing the patient to an alternative fixed resource such as primary care, medical, surgery or hospital service or
- Offering care advice over the telephone.

3.9.2.1 Because of aggressive triage (called medical regulation) only about sixty five percent of requests to SAMU actually receive an ambulance response. Current performance on emergency calls is arrival at scene within 10 minutes for 80% of responses and within fifteen minutes for 95% percent of responses.
3.9.2.2 SAMU is organized at the 'Department' level with each Department organizing its own service, each of which is identified with a unique code for instance SAMU zero six in Nice and SAMU seventy five in Paris.

Additionally, two SAMU have special tasks:

- The SAMU seventy five is responsible for providing service to fast trains (TGV) and Air France aircraft while in flight.
- The SAMU zero six is responsible for providing service to ships at sea.

3.9.2.3 In addition to the mainland French Departments SAMU also operates in most of the offshore American Departments such as Guadeloupe (SAMU Nine-Seven-One (971)) Martinique Guyane or Pacific and Indian French Islands (Tahiti Reunion)

3.9.3 Model of Care

The Emergency Medical Services system in France follows Franco-German Model of Care.

3.9.4 Emergency Access number

France along with the rest of the continental European Union uses the emergency telephone number available across all members One-One-Two (112), which gives access to police, fire and ambulance services. However, the legacy emergency number of Fifteen '15' for SAMU and Eighteen '18' for fire department Casualties' Rescue and Assistance Vehicle (VSAV) is still in use.

3.9.5 Training

- First Responders

3.9.5.1 In France the pre-hospital care is either performed by first responders from the fire department or from a private ambulance company or by a medical team that includes a
physician, a nurse and an ambulance technician (called "SMUR"). The intermediate scale, the firefighter nurse, is only a recent evolution and is performed by nurses specially trained acting with emergency protocols. These nurses are the French equivalent of paramedics.\textsuperscript{81}

3.9.5.2 The first responders are thus the most frequent answer to emergency calls. In addition in France there exists a network of first responder associations, as French Red Cross, civil protection (protection civil) or others. These Certified First Responders (CFR) volunteers are allowed to supervise massive outside meetings, student fests, etc.

These volunteers have followed the same special rescuer training as firefighters.\textsuperscript{82}

3.9.6 Ambulance provision

In the French system, the word "ambulance" itself is reserved to transportation of one individual on a stretcher on medical prescription including oral prescription in case of emergency.

The term is generally used to apply to those response vehicles operated by the local SAMU as well as the emergency vehicles from places such as the fire service or private companies which are both fully equipped emergency patient transport vehicles the "reds" (fire service) with three or four staff members on board, the "whites" (private companies and hospitals) with two staff members on board. Basically both teams reds and whites have the same first aid-based medical training. The reds as they handle road accidents as well, are also trained in taking care of heavily wounded persons, extraction of wounded out of wrecks etc.\textsuperscript{83}

Consequently under the SAMU system in France there are a number of different providers of emergency medical services offering different levels of care and dispatched for different types of condition.\textsuperscript{84}
3.9.6.1 While all of the above types of vehicles attempt to meet some aspects of the European standard for ambulances CEN one-seven-eight-nine (1789) published by the European Committee for Standards, the degree of compliance varies, particularly among those vehicles not officially referred to as ambulances in France.85

3.9.6.2 Fire department services

Emergency response may be through the use of a fire department based rescue ambulance. Here the trained firefighters will provide on scene care and transport for injuries or illness, but are usually backed up by a (SMUR) unit for more serious issues.86

Their vehicles are called Casualties Rescue and Assistance Vehicle (VSAV) or Rescue vehicles (VPS).

The VSAV and VPS are considered to be means of bringing rescue workers and equipment onsite, with the evacuation of patients being only the logical result of the response, but not the primary duty of these response resources.

3.9.6.3 SMUR (Mobile Emergency and Resuscitation Service)

The French philosophy on emergency medical care is to provide a higher level of care at the scene of the incident and so SMUR units are staffed by a qualified physician along with a nurse and / or emergency medical technician. 87

3.9.6.4 This contrasts with systems in other parts of the world notably the Scoop and Run Anglo-Saxon countries (United States, Australia etc.) where care on scene is conducted primarily by paramedics or emergency medical technicians with physicians only becoming involved on scene at the most complex or large scale incidents.
3.9.6.5 The result is that a SMUR unit will typically spend a long time on scene compared with a paramedic ambulance in a different system as the physician may conduct a full set of observations, examinations and interventions before transfer to hospital.  

SMUR units are hospital based and although the vehicles are typically labeled 'SAMU' that term actually refers to the overall integrated service which controls multiple SMUR units (perhaps even from multiple hospitals) and all emergency care resources within a community from General Practitioners (GP) to Hospital Intensive Care services.

Despite being hospital based SMUR unit may choose to transport a patient to an alternative hospital, where the best definitive care may be provided, and are not necessarily tied to the hospital of origin.

3.9.7 Funding

In France the Hundred (100) or so SAMUs (one for each Department) are all operated by public hospitals. Public hospitals (unlike private hospitals, and France has both) receive government funding. France operates on a system of universally accessible socialized medicine.

Patients have freedom to choose physicians, hospitals etc., and there are prices set for each type of service.

3.9.7.1 When operating in the public system patients are asked to co-pay a portion of the cost for each type of care that they receive. To illustrate; a patient requiring hospitalization is liable for twenty percent of costs for the first month, and nothing thereafter.

All requests for ambulance service are processed by the local SAMU, which will determine what type of assistance and transportation resources are sent; the patient has no choice in the matter when it is an Intensive Urgent Care Need.
3.10 Emergency medical services in Sri Lanka are being established using a public/private system aimed at the provision of emergency ambulance service, including emergency care and transportation to hospitals.

3.10.1 The Pre-Hospital Care Committee is part of the Trauma Secretariat of the Sri Lanka Ministry of Healthcare and Nutrition and was established in 2004 tsunami. The goal of the Pre-Hospital Care Sub-Committee is “During this generation and continuing for future generations, everyone in Sri Lanka will have access to trained pre-hospital medical personnel, ambulances will be available to transport the sick and injured safely to hospitals, complications from harmful or inadequate pre-hospital care eliminated so physician and nursing personnel at hospitals are able to professionally treat and rehabilitate back to society as contributing citizens.” Pre-Hospital care is an essential core component of trauma system.

3.10.2 Model of Care

The Emergency Medical Service system in Sri Lanka follows Franco – German model of care.

3.10.3 Emergency Access Number

The emergency access number for Emergency Medical Services, reserved by the Telecommunications Regulatory Commission for Sri Lanka is One-One-Zero (1-1-0) and is operational in the districts of Colombo, Galle, Kandy and Jaffna with plans to expand to provide national coverage.

3.10.4 Training

The pre-hospital care sub-committee has established minimum standards for Emergency Medical Technician (EMT) education in Sri Lanka. Currently EMTs and Pre-Hospital personnel work in four distinct areas: Fire Brigades, Hospitals, Community Based Organizations and Private Services.

3.10.4.1 All Sri Lankan EMTs are trained on international EMS standards adopted by the Trauma Secretariat of the Ministry of Healthcare and Nutrition. The Sri Lankan standards are
comparable to the National Registry of EMTs of USA (United States Department of Transportation Guidelines) and the UK College of Emergency Medicine standards.

EMT training in Sri Lanka is divided into four training levels.\textsuperscript{91}

3.10.4.2 EMT- Level 1:

The Sri Lanka EMT-Level 1 is the first level of EMS training beyond community responders (First Aid and Advanced First Aid). Typically EMT Level - I may be fire fighters, police officers, lifeguards, coaches, or teachers. Level 1 EMTs are trained in basic rescue, oxygen use, Cardio Pulmonary Resuscitation (CPR), splinting, and safe ambulance operations.

3.10.4.3 EMT- Level 2:

Level 2 EMTs are sometimes referred to as EMT-Basics or EMT-Ambulance Officers in other countries. Training at this level ideally requires 120 – 160 hours of classroom and clinical education for students to demonstrate the knowledge, attitude and skills required.

3.10.4.4 EMT- Level 3:

Level 3 EMTs or EMT-Intermediate Level is a more advanced professional level of pre-hospital care providers. Typically level 3 EMTs are more senior and experienced EMTs

3.10.4.5 EMT- Level 4:

Level 4 or EMT-Paramedic represents the highest level pre-hospital care professionals.

3.10.5 Ambulances

Ambulances in Sri Lanka are undergoing a transformation from a simple transport vehicle to a mobile treatment and stabilization unit that will actually lead to the development of modern Emergency Medical Services.\textsuperscript{91}
3.10.6 Funding
In Sri Lanka Emergency Medical Services is funded by public private system under Sri Lanka Ministry of Healthcare and Nutrition.
EMERGENCY MEDICAL SERVICES IN SOUTH AFRICA

3.11 Emergency medical services in South Africa are provided through a public/private system aimed at the provision of emergency ambulance service including emergency care and transportation to hospital.  

3.11.1 Model of Care

The Emergency Medical Service system in South Africa follows the Anglo-American model of care. 

3.11.2 Emergency Access number

The national emergency access number in South Africa is One-Zero One-Seven-Seven (10 177). 

3.11.3 Response time

There is currently no official "response time" standards in the South African system. However, response times of fifteen minutes for high-acuity calls in urban areas are considered acceptable and in rural areas response times of up to forty minutes for similar calls are not uncommon. 

3.11.4 Training

In South Africa there are currently three different levels of proficiency in training:

- 3.11.4.1 Basic Ambulance Assistant (BAA) - This is a Basic Life Support (BLS) certification and approximately equivalent of the U.S. EMT-B. This is the minimum qualification to be a crew member of an ambulance in South Africa.

- 3.11.4.2 Ambulance Emergency Assistant (AEA) - This is an Intermediate Life Support (ILS) certification and generally the equivalent of the U.S. EMT-I, but with some added skills. To apply for this training, candidates must have a minimum of one thousand hours of practical experience as a BAA and they must pass an entrance exam to be eligible for the course.
3.11.4.3 Critical Care Assistant (CCA) - This is an Advanced Life Support (ALS) certification which is not currently aligned to any National Qualification Framework (NQF) Diploma. Candidates must complete a one thousand two hundred hour course to qualify as a CCA.  

There are currently two different University qualifications:

- 3.11.4.4 Emergency Care Technician (ECT) - This mid-level course is of two years duration and exits on a level just above what many know as Intermediate Life Support (ILS) but below Advanced Life Support (ALS).

- 3.11.4.5 The Bachelor Degree Technology (BTech) or Bachelor Degree in Emergency Medicinal Care (BEMC), is a four year professional degree and students who achieve this degree are eligible to be registered with the Health Professions Council of South Africa (HPCSA) in the register for Emergency Care Practitioner (ECP) which has an additional scope of practice.

3.11.5 Ambulance Services

3.11.5.1 Land Ambulance

Emergency ambulance service is provided by each South African province. The system of government operated ambulances is generally referred to as 'Metro'. Operations are normally administered at the local level through the Emergency Management Service which oversees police and fire protection as well.

3.11.5.2 These publicly operated services are supplemented by two private-for-profit ambulance companies Net Care Nine–One-One (911) and ER Twenty Four (24) both of which operate nationally and by a variety of local private services such as Ambu Stat.
3.11.5.3 The statutory services and private companies are further supplemented by voluntary ambulance services, including the South African Red Cross and St. John Ambulance. All are required to meet the same standards as the public services with respect to staff qualifications.

3.11.5.4 Air Ambulance

Public air ambulance service is provided by the Red Cross Air Mercy Service from bases throughout the country. The system operates both helicopters and fixed wing aircraft and both turboprop and jet aircraft as well.\textsuperscript{98}

3.11.5.5 Vehicles

The vehicles used by EMS in South Africa can vary greatly across a broad range. They may be large or small, new or quite old, often driven by local economics. There is no specific current standard for ambulance design in South Africa.

3.11.5.6 Some vehicles comply with either the European standard CEN 1789 or the U.S. standard, KKK-1822 but many meet neither standard.\textsuperscript{108}

3.11.6 Funding

Emergency medical services are funded by each South African province. The government system is supplemented in many areas by voluntary services. The standards for operation are set by the provincial Health Department which also provides vehicles, equipment, and operating expenses. Operations are normally administered at the local level through the Emergency Management Service which oversees police and fire protection as well.\textsuperscript{99}
3.12 The Kenya Red Cross society (KRCs) is a Humanitarian relief organization created on 21st December, 1965 through an Act of Parliament Cap 256 of the Laws of Kenya.

It is a voluntary organization.

It currently operates through a network of 62 Branches and 70,000 volunteers countrywide.

3.12.1 Model of Care

The Emergency Medical Services system in Kenya follows Franco - German model of care.

3.12.2 Emergency Access Number

Emergency Access number in Kenya is 0700 395 395.

3.12.3 Training

Kenya Red Cross School of Emergency Medical Services (KRCS School of EMS) is an arm of Kenya Red Cross Society mandated to provide Emergency Medical Service trainings to meet the demand of the pre-hospital emergency care in Kenya.

The courses offered at the School aim to empower emergency medical responders with knowledge and skills in the following areas:

- Emergency search and rescue
- Stabilization on site
- Communication protocols
- Documentation and transportation to appropriate health care facilities
- Emergency medical dispatch

Kenya Red Cross Society is recognized as a trainer by Directorate of Industrial trainings (DIT) and the Directorate of Occupation Health and Safety (DOHS). In addition the instructors are certified as trainers by Professional Trainers Association of Kenya (PTAK) and the National Resuscitation Council of Kenya (NRCK) who are the accrediting bodies for trainings on emergency care locally.
3.12.3.1 KRCS collaborates with international EMS experts for program development, standards and quality control. Pursuant to the above, Kenya Red Cross School of Emergency Medical Services offers nine months ‘Emergency Medical Technicians’ Course.

3.12.4 Ambulance
Kenya Red Cross registered a company by the name Emergency Plus Medical services (E – Plus) to offer 24hr ambulance service, first aid training and sale of first aid kits. E-plus was officially launched on 23rd March 2010.

3.12.4.1 The Company offers

- 24hr emergency ambulance service
- Standby ambulance service for sports and other events
- First Aid training
- Sale of first aid kits

3.12.5 Funding
Kenya Red Cross sources of funding.

Kenya Red Cross Society entirely depends on funding by both local and international donors and well-wishers who primarily support key projects of their choice under Red Cross programs.

While Kenya Red Cross has the potential and capability to manage these disasters, there has not been a disaster reserve or kitty at its disposal for rapid response whenever disasters occur.

For this reason the profits that would be generated by E-plus are set aside for disaster and humanitarian activities by the Kenya Red Cross.
EMERGENCY MEDICAL SERVICES IN PAKISTAN

3.13 EMS in Pakistan are provided by Edhi Foundation and Al-Khidmat Foundations.

- **Edhi foundation** provides twenty four hour emergency assistance across the nation of Pakistan. Edhi Foundation, the largest welfare organization is a non-profit social welfare program in Pakistan. The foundation has over three hundred centers across the country in big cities, small towns and remote rural areas providing medical aid, family planning and emergency assistance. They own air ambulances providing quick access to far-flung areas. Its headquarters are in Karachi, Pakistan.

3.13.1 In Karachi alone, the Edhi Foundation runs eight hospitals providing free medical care through eye hospitals, diabetic centers, surgical units, a four bedded cancer hospital and mobile dispensaries. In addition to these the Foundation also manages two blood banks in Karachi.

- **Al-Khidmat Foundation** network provides humanitarian services across Pakistan. It is registered with the Government of Pakistan as a non-governmental organization (NGO).

3.13.2 Emergency Access Number

Rescue One-One-Two-Two (1122) is an emergency service that serves Punjab Province in Pakistan. It was established under the Punjab Emergency Service Act 2006 to provide management of emergencies such as fire, rescue and emergency medical services. The Punjab Emergency Council and District Emergency Boards have been constituted to ensure management and prevention of emergencies and to recommend measures for mitigation of hazards endangering public safety.

3.13.2.1 Rescue One-One-Two-Two (1122) is operational in all Districts of Punjab with a population of over eighty million and providing technical assistance to other Provinces of Pakistan. Rescue One-One-Two-Two (1122) includes Emergency Ambulance, Rescue and Fire services and a Community Safety program.

3.13.3 Model of Care

The Emergency Medical Service system in Pakistan follows Anglo-American model of care.

3.13.4 Training

The Emergency Services Academy, the first training institute of its kind in Pakistan has been established as a center for imparting emergency medical training, firefighting, collapse structure search and rescue, high angle and confined space rescue, water rescue and other emergency management skills.

3.13.5 Ambulances

Ambulance Services in Pakistan is provided as:

- **Field Ambulance Service** provides 1800 ambulances
- **Air Ambulance Service** provides two airplanes and one helicopter.
- **Marine and Coastal Service** provides weather warnings, air-drops food supplies, and recovers dead bodies.
- **Emergency Check posts** provide immediate emergency care.

3.13.6 Funding

Edhi foundation provides free medical care whereas Al-khidmat foundation is registered with Government of Pakistan as non-governmental organization.
3.14 Bangladesh Emergency Medical Services are urban centered. Semi-urban facilities are less adequate and rural facilities are absent.

3.14.1 Emergency Access Number
There is no Emergency Access Number in Bangladesh

3.14.2 Model of Care
The Emergency Medical Service system in Bangladesh follows Anglo-American model of care.

3.14.3 Training:
In Bangladesh there are currently four different levels of proficiency in Short course training.
FR (First Responder) e.g. Police, Firefighters.
EMT B (Emergency Medical Technician Basic)
EMT I (Emergency Medical Technician Intermediate)
EMT P (Emergency Medical Technician Paramedic)

3.14.4 Ambulances :
Bangladesh has BLS, ALS Ambulances and air transport ambulances.

3.14.5 Funding
EMS in Bangladesh is funded by the Government.
3.15 EMS in Sudan is known as The Angel One® a medical transport program covering the entire state of Arkansas and its surrounding states covering a radius of approximately two hundred miles around Little Rock.

3.15.1 Emergency Access Number
Toll Free: 1-800-224-4357
Direct Line: 501 364-6429

3.15.2 Model of Care
The Emergency Medical Service system in Sudan follows Anglo-American model of care.

3.15.3 Training
The Emergency Medical Services Training Funds are available for EMS Certification programs, auxiliary programs and continuing education programs whose lessons are based upon the learning objectives in the United States Department of Transportation’s Intermediate-Ninety Nine and Paramedic curricula.

3.15.4 Ambulances
Arkansas Children's Hospital (ACH) owns and operates four ground ambulances and two twin engine instrument flight capable helicopters. Medically equipped fixed-wing aircraft is also utilized through preferred providers.
3.15.4.1 On an average, they transport five patients a day with an average transport time of five hours, and can reach any part of the state within one hour of departure from hospital. They perform more than two thousand one hundred total transports per year with one thousand two hundred by helicopter.

3.15.4.2 When referring physicians contact the Angel One Communications Center they are connected with the appropriate ICU attending physician and other specialty physicians for transportation or consultation needs. Medical staff consists of trained registered nurses and respiratory therapists who are competent in pediatric, neonatal, burn and high risk obstetrical (HROB) critical care transport.

3.15.5 Funding

Emergency Medical Services Training Funds program was developed and implemented by the Virginia Office in 2008 following the authorization of additional funding by the Virginia General Assembly. In 2007, the Virginia General Assembly created a legislative subcommittee to look into different ways to incentivize current volunteer fire and EMS personnel as well as to look at ways to assist with retention and recruitment of new personnel into the volunteer ranks.

3.15.5.1 The Committee reviewed several different proposals and settled on requesting that the current "$4 for Life" program be increased by twenty five cents with all additional money being directed to the training and continuing education of EMS personnel. This program is a contract based funding program which is outcomes and performance based.

---

EMERGENCY MEDICAL SERVICES IN AFGHANISTAN

3.16 Afghanistan is one of the most heavily mined countries in the world. Landmines kill an
estimated ten to twelve people each day in Afghanistan. There is no emergency mobile medical and surgical service available, even in Kabul and the other major cities. Afghanistan World Foundation (AWF) is raising funds to purchase several US made units that will each cost about $ three lakh. AWF works with internationally renowned surgeons who volunteer their expertise and time to train Afghan health professionals and doctors in rendering emergency care and develop skills.

3.16.1 Model of care
The Emergency Medical Service system in Afghanistan follows Anglo-American model of care.

3.16.2 Emergency Access number
To access service in an emergency, the number is 112 from a land line or 020-112 from a cell phone.

3.16.3 Training
There is no formal training program available in EMS.

3.16.4 Ambulance:
The Kabul Ambulance Service is staffed and administrated by Afghan employees who have been trained and equipped by a Norwegian NGO. The service is operational from 8.30 a.m. to 3.30 p.m. seven days a week.

3.16.5 Funding
Emergency Medical Service in Afghanistan is funded by the Ministry of Public Health.

EMERGENCY MEDICAL SERVICES IN NEPAL
3.17 Very limited pre-hospital emergency care system exists in Nepal. Victims of trauma or medical emergencies in Kathmandu are transported to hospital either by taxi or private vehicle.

3.17.1 Model of Care

The Emergency Medical Service system in Nepal follows Anglo-American model of care.

3.17.2 Emergency Access number

There is no emergency access number in Nepal.

3.17.3 Training

Emergency Medical Technicians are trained by experts from Stanford Emergency Medicine International (SEMI), Stanford University School of Medicine, USA.

3.17.4 Ambulance Service

The Nepal Ambulance Service (NAS) is a non-profit initiative dedicated to the establishment of an emergency medical response system (EMS) in the greater Kathmandu and Patan municipalities, later to be expanded nationwide. NAS aims to operate fully equipped and staffed ambulances via a central dispatch facility with radio communication between area hospitals and ambulances. This system will provide rapid ambulance transport to hospitals along with life-saving medical care by trained emergency medical technicians (EMTs) for sick and injured people, regardless of ability to pay.

3.17.5 Funding

In Nepal Emergency Medical Services are funded by municipalities of Kathmandu and Patan.
EMERGENCY MEDICAL SERVICES IN INDIA

3.18 Every four minutes, one Indian dies on the roads, while seven to ten percent are critically injured, twenty to thirty percent are seriously hurt. Of these, about thirty percent are disabled for life, either partially or totally. India requires a better emergency medical service to meet the growing number of emergencies.

3.18.1 ‘The Golden Hour’ and the ‘Platinum Ten Minutes’ typifies the importance of Emergency Medical Services (EMS) all over the world. It is a well-accepted fact that a patient who receives basic care from trained professionals and is transported to the nearest healthcare facility within fifteen-twenty minutes of an emergency has the greatest chance of survival. In spite of the development in the healthcare sector over the past decade, India is yet to create a single, comprehensive EMS that can be accessed throughout the country. There is no single system which can play a major role in managing emergency medical services in India. Only fourteen states have managed to launch a state wide EMS, as on today.

There is a fragmented system in place to attend to the emergencies in rest of the country.

3.18.2 Emergency Access Number

One Zero Two (102) is the emergency telephone number for ambulance in parts of India. There are different emergency numbers in India’s twenty nine states and six Union Territories. Hospitals in the country provide different telephone numbers for ambulance services. The Centralized Accidents and Trauma Services (CATS) were set up by the Delhi Government in the early 1990s.

This service was later expanded throughout the country. Unfortunately, it didn’t succeed despite having a toll free number 102 that was made available through various media.

3.18.2.1 More recently, NGOs and hospitals have come forward to provide their own EMS. There have been considerable efforts by states across India to develop emergency services.

GVK Emergency Management and Research Institute (GVK EMRI) was founded in 2005. To begin with, its operations were limited to
Hyderabad and Andhra Pradesh with a vision of responding to thirty
million emergencies and saving 1 million lives a year.

3.18.2.2 In 2007, with the extension of Ambulance Access for All (AAA)’s services, American
Association of Physicians of Indian Origin (AAPI) founded Emergency Medical Service (EMS)
for Mumbai. AAPI has collaborated with the Confederation of Indian Industries (CII) and signed
a MoU to endorse the growth of the healthcare sector in India, especially in rural areas. This
agreement is to provide knowledge and technology transfer and provide EMS to develop
healthcare facilities in India.

3.18.2.3 Another such facility, Life Support Ambulance Service (LSAS) operating in Mumbai
for three years in association with London Ambulance Service UK has now made inroads into
Kerala and has five hundred ambulances that can be reached on a toll free number 1298.

3.18.2.4 Recently, the Gujarat state government set up the Gujarat Emergency Medical Services
Authority (GEMSA). Institute of Kidney Diseases and Research Centre (IKDRC), U.N. Mehta
Institute of Cardiology and Research Centre, Gujarat Cancer Research Institute (GCRI), GVK
EMRI and Public Health Institute, Gandhinagar have entered into several other PPP projects to
improve the emergency services in the state.

3.18.2.5 108 (emergency telephone number)

108 (usually pronounced "one Zero eight") is a free telephone number for emergency services to
call in the Indian states of Andhra Pradesh, Punjab, Gujarat, Uttarakhand, Goa, Rajasthan, Tamil
Nadu, Chhattisgarh, Karnataka, Kerala, Assam, Meghalaya, Himachal Pradesh and Madhya
Pradesh when an emergency arises.

3.18.2.6 The One Zero Eight (108) Emergency Response Services is a free twenty four by seven
emergency service for providing integrated medical, police and fire emergency services. The
service is provided in Public Private Partnership between State Government and private
organization.
The process

**3.18.2.7** When an emergency is reported through One Zero Eight (1-0-8), the call taker gathers the needed basic information and dispatches appropriate services.

The One Zero Eight (108) Emergency Response Service should be called:

- To save a life
- To report a crime in progress
- To report a fire
- Anytime an emergency response is required for medical, law enforcement and fire.

Basic information obtained includes:

- Location of the call. (District/ City/ Town/ exact location/ landmark).
- The type of emergency.
- Number of people injured and the condition of the injured.
- The caller’s name and contact number – for location guidance if required.

**3.18.2.8** Emergency help dispatched through this process is expected to reach the site of the emergency in an average of 18 minutes. Pre-hospital care is given to patients being transported to the nearest hospital.

**3.18.2.9** Out of twenty nine states, presently One Zero Eight (108) call services are available in fourteen states. The major changes have been the incorporation of GPS tracking systems and advanced radio communications. In other states of India, one can call the emergency services by dialing. Police: 100; Fire: 101; Ambulances: 102

**3.18.3 Response Time**

Currently, the response time in India is twenty minutes in urban locations and thirty minutes in rural areas.
3.18.4 Training

In India, many private hospitals and institutes have been providing training in EMS for doctors, nurses and paramedics since 1994. The certification programme varies from six months to three years. There are no Paramedic Schools in India and no formal agreement on the standards of education that needs to be provided to EMT’s in India.

3.18.4.1 In India, Symbiosis Institute of Health Sciences (SIHS) conducts training programme for Doctors and Nurses as Post Graduate Diploma in Emergency Medical Services (PGDEMS). Since January 2002 this program of SIHS is the University accredited academic program under aegis of SIU, recognized by university grants commission (UGC) ministry of HRD, Govt. of India. The curriculum and format is recognized by the Los Angeles Paramedic Training Institute and Department of Transportation USA.

GVK EMRI initiated the Post Graduate Program in Emergency Care (PGPEC) in collaboration with the Stanford School of Medicine, USA, since July 2007, for training paramedics.

Indian Institute of Emergency Medical Services (IIEMS) having its headquarters in Kerala Started in 1986 offers Emergency Medical services programs.

3.18.4.2 Healthcare sector skill council is a unique Initiative of Confederation of Indian Industry (CII), National Skills Development Corporation (NSDC) and leading Healthcare Service Providers to create a robust and vibrant eco-system for quality education and skill development in the country with an overall objective of facilitating skilling of 4.8 million workforce in the Allied Healthcare and Paramedics over the next ten years. HSSC offers training program in Emergency Medical Technician - Basic and Emergency Medical Technician – Advanced.

Sri Ram Chandra University, Chennai and Vinayaka Missions University, Salem offers four years B. Sc. in Emergency and Trauma Care technology.
3.18.5 Ambulance
India has two types of ambulances –

3.18.5.1 Basic Life Support (BLS):  
A vehicle ergonomically designed suitably equipped and appropriately staffed for the transport and treatment of patients requiring noninvasive airway management/ basic monitoring.  
BLS ambulance is used to transport relatively stable patients.

3.18.5.2 Advanced Life Support (ALS):  
A vehicle ergonomically designed suitably equipped and appropriately staffed for the transport and treatment of patients requiring invasive airway management/ intensive monitoring.  
ALS ambulance contains all emergency equipment and drugs necessary to manage any kind of patient emergency.

3.18.6 Funding  
In fourteen states of India EMS is funded through Public Private Partnership.