

REPUBLIC OF KENYA



MINISTRY OF HEALTH

KENYA NATIONAL FRAMEWORK FOR THE ORGANIZATION OF TRAUMA SERVICES



*Saving lives: Universal access
to trauma services in Kenya*

AUGUST 2021



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Kenya National Framework for the Organisation of Trauma Services
Developed by the Department of Non-Communicable Diseases - Ministry of Health

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Enquiries regarding the Kenya National Framework for the Organisation of Trauma Services

SHOULD BE ADDRESSED TO THE:

DEPARTMENT OF NON-COMMUNICABLE DISEASES,
MINISTRY OF HEALTH

P.O. BOX 30016 – 00100 NAIROBI, KENYA

TELEPHONE: +254 202717077/+254202722599

EMAIL: ncddepartment@gmail.com

Website: ncd-icc.or.ke or www.health.go.ke

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ABBREVIATIONS AND ACRONYMS

A&E	-	Accident and Emergency Unit
AED	-	Automated External Defibrillator
AEMT	-	Advanced Emergency Medical Technician
AMREF	-	African Medical and Research Foundation
ALS	-	Advanced Life Support
ATLS	-	Advanced Trauma Life Support
ATCN	-	Advanced Trauma Course for Nurses
BLS	-	Basic Life Support
BTLS	-	Basic Trauma Life Support
CALS	-	Comprehensive Advanced Life Support
CBR	-	Community-Based Rehabilitation
CHV	-	Community Health Volunteer
CHEW	-	Community Health Extension Worker
CORP	-	Community-Owned Resource Persons
CT	-	Computed Tomography
DALYs	-	Disability Adjusted Life Years
DHIS	-	District Health Information System
DPHK	-	Development Partners in Health, Kenya
DQA	-	Data Quality Analysis
EMT	-	Emergency Medical Technician
EOC	-	Emergency Operations Center
ETAC	-	Emergency Transport Attendant Course
EVOC	-	Emergency Vehicle Operators Course
FBO	-	Faith-Based Organization
HDU	-	High Dependency Unit
HRIO	-	Health Records and Information Officer
ICRC	-	International Committee of the Red Cross
ICU	-	Intensive Care Unit
IT	-	Information Technology
KEBS	-	Kenya Bureau of Standards
KNBS	-	Kenya National Bureau of Statistics
KRCS	-	Kenya Red Cross Society
MCI	-	Mass Casualty Incident
M&E	-	Monitoring and Evaluation
MES	-	Managed Equipment Service
MSF	-	Medicines sans Frontiers (Doctors without Borders)
MRI	-	Magnetic Resonance Imaging
NCD	-	Non-Communicable Diseases
NCD ICC	-	NCD Interagency Coordinating Committee
NHIF	-	National Hospital Insurance Fund
OPD	-	Out-Patient Department
SARAM	-	Service Availability and Readiness Assessment Mapping
SOPs	-	Standard Operating Procedures
STN	-	Society for Trauma Nurses
TTT	-	Trauma Teams Training

UHC	-	Universal Health Coverage
UNGA	-	United Nations General Assembly
VIP	-	Violence and Injury Prevention
WHO	-	World Health Organization

FOREWARD



Trauma has become a global public health issue, with injuries killing approximately 5 million people every year and accounting for 10% of the world's deaths. In Kenya, injuries account for 7% of all deaths, with majority being attributable to road traffic crashes, assault, falls and burns. Mortality from injuries is projected to increase by 25% by 2030 if sufficient measures are not put in place. For every person who dies of trauma, several thousands of injured persons survive with permanent disabling sequelae. Many of these deaths and disabilities are preventable through multisectoral action, awareness creation and behavior change, environmental modification and stronger health systems to respond to

trauma when and if it occurs. Further, trauma is not only a health issue, but also a serious setback to our social and economic development with significant implications in terms of lost productivity and premature deaths.

It is for this reason that the Ministry of Health, through a multi-stakeholder and participatory approach developed the Kenya National Framework for the Organization of Trauma Services. In line with the country's Big Four Agenda, the Government has prioritized Universal Health Coverage with a focus on access to quality essential health services for all. This Framework is aimed at ensuring universal access to trauma care through clear roles and responsibilities of all the different levels of care. This will ensure a harmonized referral system with basic trauma prevention and treatment services available close to the people while decongesting the county and national referral facilities. To this end, we are committed to working with the county governments, trauma stakeholders, public and private sector healthcare providers and academic institutions to ensure that this framework forms part of the standard package of care.

The Framework focuses on four fundamental trauma service delivery pillars and five essential trauma care investments to attain the country's injury prevention and care agenda. Implementation of this important document is intended to facilitate attainment of the Sustainable Development Goals (SDGs) that relate to trauma, including reducing by half the number of deaths and injuries from road traffic accidents. It is further envisaged that this Framework will contribute to equitable and accessible trauma care services in line with the health sector's commitment to the attainment of Universal Health Coverage in Kenya.

Let us all join hands in reducing the burden of trauma in Kenya in

A handwritten signature in black ink, consisting of a stylized 'M' followed by a series of loops and a long horizontal stroke.

Hon. Sen. Mutahi Kagwe, EGH
Cabinet Secretary for Health

ACKNOWLEDGEMENT



The Ministry of Health acknowledges all the individuals and organizations who dedicated their time and effort towards the development of the Kenya National Framework for the Organization of Trauma Services. We appreciate the immense support from the office of the Cabinet Secretary, Chief Administrative Secretaries, Principal Secretary, Director General, and all the Directorates within the Ministry of Health that greatly contributed to the success of this process. We also recognize the stewardship and guidance role provided by the Department of Non-Communicable Diseases, and particularly the Division of Violence and Injury Prevention and Control. In a special way, we also wish to convey our gratitude for the support received from the County Governments.

Susan N. Mochache, CBS

We wish to thank the writing team that worked tirelessly to ensure the successful completion of this document led by Dr. Waqo Ejersa, Dr. Gladwell Gathecha, Dr. Oren Ombiro, Dr. Joseph Kibachio, Anne Kendagor, Dr. Loise Nyanjau, Dr. Nasirumbi Magero, Scholastica Owondo, Dr. Joyce Nato, Dr. Daniel Ojuka, Dr. Peris Waithiru, Fred Majiwa and Benn Mugoh. We sincerely thank all our partners including the World Health Organization, Surgical Society of Kenya, Kenya Orthopedic Association, Emergency Medicine Kenya Foundation, St. Johns Ambulance, Kenya Red Cross, International Canadians for Change and many other stakeholders for their technical support during the development of this document. To all who participated in one way or another in developing the Framework, we are truly grateful.

The Ministry of Health is grateful for generous financial support from the World Health Organisation and Centric Air Ambulances.

A handwritten signature in black ink, appearing to read 'Susan N. Mochache'.

Susan N. Mochache, CBS
Principal Secretary
Ministry of Health

Executive Summary



Dr. Patrick Amoth, EBS

The Kenya National Framework for the Organization of Trauma Services is the first-ever guidance in Kenya to establish a working Trauma Care System as a key component of the healthcare system.

The framework highlights the key components required to provide quality continuum of care, which includes injury prevention, pre-hospital care, hospital, and rehabilitation care.

1. The injury prevention phase prioritizes the following components; policy environment, awareness creation and the development and implementation of safety standards.
2. The pre injury phase is aligned with the Emergency care policy and give guidance for the key steps: early detection, notification, dispatch/response, on the scene care and transfer. Included in this section is how to conduct mass casualty triage.
3. The hospital care details the trauma care services offered at each of the six levels of health care. Accompanying this section are the requisite human resource and equipment required.
4. The rehabilitation phase is the final phase which intertwines with the hospital phase and should be initiated as early as possible. The section also highlights the services offered at each level and notes the human resource and equipment requirement.

In order for the above four levels to operate efficiently there, are five key investments that required to provide a supportive environment. The investments of a trauma care system include five key elements: leadership & governance, human resources, information management, financing, technology & innovation and quality improvement. In a model system, these elements are integrated and coordinated to provide cost-efficient and

appropriate services across the continuum of care. The framework gives detailed guidance on the requirements of each of these investments

In chapter four, the framework explains the roles of different stakeholders in the Implementation of the Framework includes the keys roles of the Ministry of Health, County governments, Key ministries, Private Sector, Faith-Based Institutions, Civil Society and Non-Governmental Organizations and General public.

A strong monitoring and evaluation framework has also been incorporated to promote an effective, efficient, quality-driven and accessible Trauma Care System in Kenya. Monitoring and evaluation of this framework shall be done in order to promote its implementation and strengthen trauma care in Kenya. The process of monitoring and evaluation will be done through tracking indicators and targets at defined time intervals by all relevant stakeholders.

The Ministry of Health commits to work hand-in-hand with professional associations, patient groups, private and faith-based institutions and other stakeholders to ensure compliance with the provisions of this framework. Lastly, I wish to congratulate the Department of NCDs for developing the trauma framework, which is an evidence - based document.



Dr. Patrick Amoth, EBS
Ag. Director General
Ministry of Health

CHAPTER I: BACKGROUND

1.1 Introduction

Injuries kill more than five million people each year globally, accounting for 10% of the world's deaths. This translates to over 15,000 lives cut short every day as a result of injuries¹.

The overwhelming majority of these deaths occur in low- and middle-income countries where most health facilities are unable to provide the needed trauma care services. In addition to this mortality burden, injuries are a major cause of morbidity, accounting for 16% of all disabilities globally¹.

1.2 The need for a trauma framework to support a unified to approach to trauma care in the country

This framework sets standards to strengthen the organization and planning of trauma care across the country in order to improve outcomes of injured persons. It does this by clearly defining trauma service packages for each level of care, taking into consideration the varying levels of trauma complexity. It also details the resources that are necessary to support these service packages. These include human resources and physical resources (infrastructure, equipment and supplies).

The framework also prescribes the modalities for trauma training programs for different cadres involved in trauma care. Additionally, it provides for cross-cutting support services such as trauma team organization, electronic medical records, telemedicine, monitoring and evaluation and quality improvement.

1.3 Rationale for improving trauma care services

While acknowledging the preventability of most injuries, it is also essential to strengthen trauma systems to ensure quality standards of care for injuries that occur despite the best prevention efforts⁶. Delays in treatment of injuries have been shown to cause increased morbidity and mortality^{7,8}. Efficient trauma care systems that ensure timely provision of care are essential to minimize the negative health consequences of injuries, including death or lifelong disability⁹. Evidence further shows that improving the organization of trauma services leads to significant reductions in trauma mortality¹⁰⁻¹²

1.4 Target audience

This document is aimed at the following key stakeholders:

1. Ministry of Health

2. County Governments
3. Regulatory bodies relevant to trauma training, prevention and care
4. Health facilities - government, faith-based and private
5. Health financing agencies, including health insurers
6. Institutions offering trauma education and training programs

1.5 Benefits of successful implementation of this framework

It is expected that the implementation of this framework will result in health gains and benefits for the Kenyan populace. These benefits will include:

1. Reduction in the number of deaths caused by trauma.
2. Reduction in the number and severity of disabilities caused by trauma.
3. Increased number of productive working years seen in Kenya through reduction of death and disability.
4. Decreased costs associated with initial treatment and continued rehabilitation of trauma victims.
5. Reduced physical and financial burden on local communities including the County governments to support trauma victims living with disabilities.
6. Decreased impact of injuries on "second trauma" victims - families.
7. Provision of data-driven, efficient population level interventions.

1.6 Vision

To be a nation free of preventable fatalities and disabilities occasioned by trauma

1.7 Mission

Promote and render accessible, timely, inclusive, innovative, data-driven, coordinated and high-quality services for preventive interventions, emergency services, definitive and rehabilitative care for trauma

1.8 Core Value and guiding principles

1. Multi-sectoral approach
2. Life-course approach
3. Human rights approach
4. Equity-based approach
5. Evidence-based
6. Integrity
7. Teamwork, collaboration
8. Innovation
9. Quality

1.9 Relevant calls by international bodies for effective trauma care

This framework is aligned to relevant global initiatives and documents that strive to save lives by improving the trauma care systems. These include;

1. Preventing injuries and violence: a guide for Ministries of Health (WHO)
2. WHO Road Safety Management Manual
3. UN Global Plan for the Decade of Action for Road Safety 2021-2030
4. WHO pre-hospital trauma care systems
5. WHO Global Emergency and Trauma Care Initiative

Process of development of Trauma Framework

The Kenya national framework for the organization of trauma services was developed through a long consultative process with appropriate stakeholders and sectors to serve as a blue print for delivery of quality trauma care services. The process ensured that the plan is evidence-informed drawing in guidance from relevant international and national documents. Evidence was gathered through desk reviews of relevant documents and information from key sectors. An initial stakeholder meeting identified the key challenges and priorities required for each level of injury continuum of care. Subsequent meetings defined appropriate requirements of each level. The process incorporated county level planning as well as taking cognisance of both service delivery in both public and private sectors.

CHAPTER II: SITUATIONAL ANALYSIS

The chapter on situation analysis is itself an in-depth analysis of violence and injuries prevention and trauma care in the country.

2.1 Burden of injuries in Kenya

In Kenya, injuries are increasingly becoming a major public health problem as road traffic injuries and violence have been ranked as the 7th and 9th leading cause of disability adjusted life years (DALYs) respectively² and they account for 7% of deaths annually. The country has seen a notable increase in unintentional injuries resulting from the effects of urbanization such as increased motorization and infrastructure development⁴. In 2017, injuries featured among the top-10 leading causes of death in the country as shown in figure 1 below.

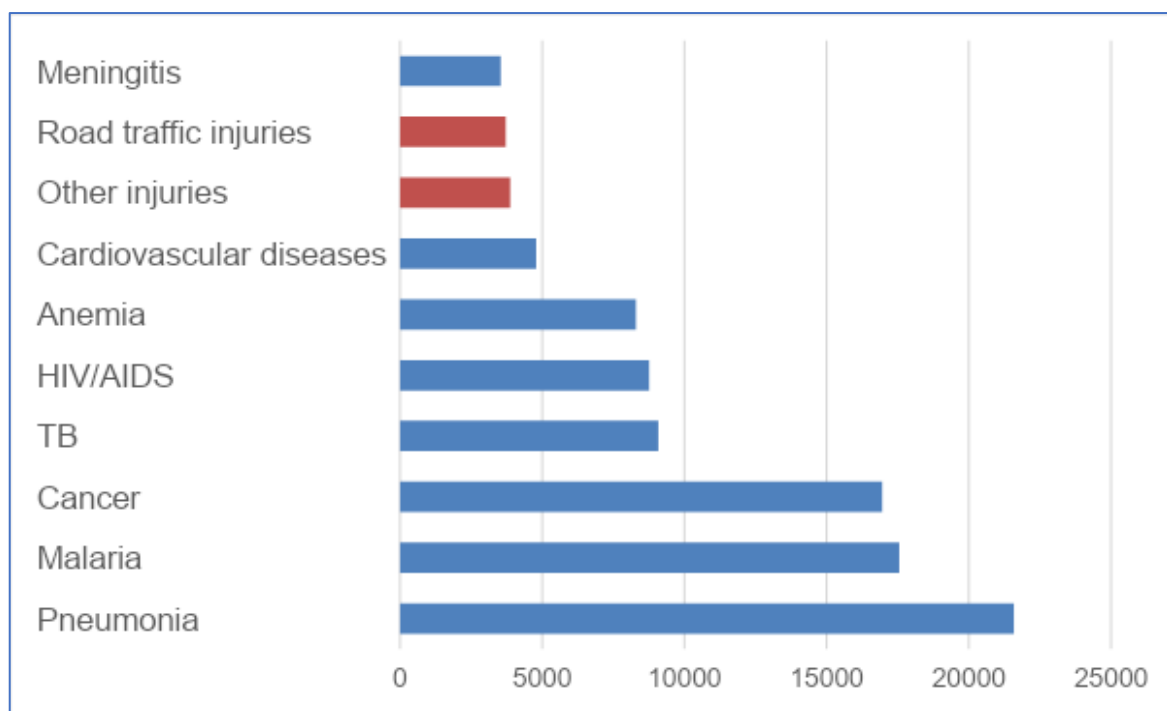


Figure 1: Top 10 causes of mortality in Kenya for the year 2017

Source: KNBS Economic Survey 2018⁵

The Kenya STEPS survey for Non communicable Diseases of 2015 showed that 10% of Kenyans has experienced serious injuries that required medical attention in the preceding 12 months. The most prevalent injuries were cuts (47%) and falls (34%).

In reality, the true mortality numbers are a gross underestimate as current data systems are inadequate, with large studies globally placing trauma mortality above that of TB, HIV/AIDS and Malaria combined¹.

The table below shows the disaggregation of the top causes of mortality in the country by age for the year 2019.

Table 1: Top Ten Causes of Death by Age, Kenya 2019

	<5	5-14	10-24	15-49	50-69	>70
1	Neonatal Disorders	HIV/AIDS	HIV/AIDS	HIV/AIDS	HIV/AIDS	Stroke
2	Diarrhea	Diarrhea	TB	TB	Stroke	LRI
3	*LRI	Typhoid and Paratyphoid	Violence	Maternal Disorders	Cirrhosis	Ischemic heart Disease
4	Malaria	Malaria	Diarrhea	Cirrhosis	TB	Diarrhoeal Diseases
5	Congenital Birth Defects	LRI	Maternal Disorders	Violence	Stroke	Cirrhosis
6	HIV/AIDS	Invasive non typhoid	Road Traffic Injuries	Diarrhea	LRI	TB
7	Protein energy malnutrition	Meningitis	Typhoid and Paratyphoid	LRI	Diarrhea	Hypertensive heart disease
8	Invasive non typhoid	Road Traffic Injuries	LRI	Road Traffic Injuries	Diabetes	**COPD
9	Whooping Cough	Protein energy malnutrition	Meningitis	Stroke	COPD	Diabetes
10	Meningitis	***Congenital BD	Malaria	Self harm	Hypertensive heart disease	Alzheimers

*LRI -Lower Respiratory Infetions, **COPD – Chronic Obstructive Pulmonary Diseases

***Congenital Birth Defects

As the country makes strides towards reduction of mortality from communicable diseases, the magnitude of mortality from injuries is projected to increase by 25% by 2030 as shown in figure 2³.

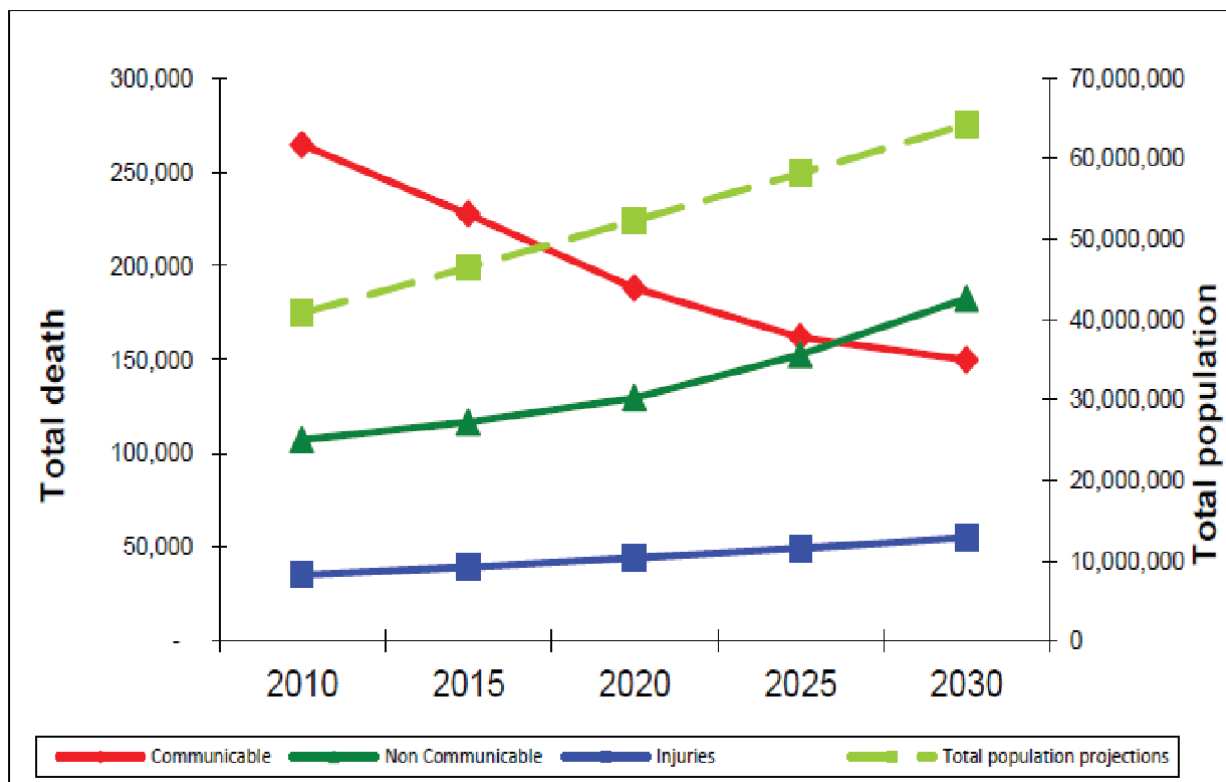


Figure 2: Mortality projections by disease domain

Source: Kenya Health Policy 2014-2030

2.2 Situation of trauma care in the country

Trauma care systems in Kenya have been described as weak due to a number of factors including poor pre-hospital care systems^{4,13,14}, inadequate infrastructure^{13,14}, inadequate medicines and supplies¹⁵, poor health worker care knowledge and skills¹⁶, weak referral systems^{16,17} and lack of robust information systems¹⁸. According to the Health Facility Assessment 2018/19 the mean availability of basic emergency services and basic surgical services was 76% and 81% across all health facilities respectively.

In response to these challenges, the National and County Governments as well as other stakeholders have been engaging in efforts to improve trauma care in the country. Some of these initiatives include:

1. Improving hospital infrastructure and equipment through the Managed Equipment Services (MES) program
2. Introduction of the NHIF surgical package
3. Training of community members (CHVs and motorcycle riders) on pre-hospital care in road traffic crash - prone areas

4. Development of policies, strategies and guidelines on emergency care and referral systems

2.3 The injury prevention and trauma care policy environment

The **Kenya national framework for the organization of trauma services** builds on the implementation of other national legislations, policies and plans thereby reinforcing them

These include:

1. The Kenya Health Act 2017 – Provides a framework for the organization of health services, governance structures and financing, particularly for emergency care.
2. Kenya Emergency Medical Care policy 2020 -2030 and Kenya Emergency Medical Care Strategy 2020-2025. This policy ensures recognition of emergency medical care as an integral component of the healthcare system and that it is offered in a coordinated way.
3. Kenya Health Policy 2014-2030 – Has prioritized injuries through its third policy objective ‘Reduce the burden of violence and injuries’. Policy objective 4 provides for integration of services in primary level structures while policy objective 6 mandates stakeholder engagement.
4. Kenya National Violence and Injury Prevention and Control Action Plan 2018 – 2022: Defines injury and the common causes of injuries in Kenya, and outlines broad strategies and interventions to reduce the burden of violence and injuries in the country
5. Human Resources for Health Norms and Standards: Provides the staffing norms by number and by cadre for each level of care
6. Kenya Health Sector Referral Strategy and Guidelines: These documents give guidance on the establishment of referral systems and provide a comprehensive approach to referrals that addresses the movement of clients, specimens, client parameters and expertise.
7. Kenya National E-health Policy 2016-2030. The vision of Kenya eHealth is to create an enabling environment for the sustainable adoption, implementation and efficient use of eHealth products and services at all levels of healthcare delivery in Kenya.

2.4 Mainstreaming of trauma care into other plans

Mainstreaming trauma care into other health programs and service delivery points is important as it maximizes the attainment of better outcomes. The following has been undertaken and it is envisioned more areas will be mainstreamed in future.

1. The Violence and Injury Prevention (VIP) Technical Working Group has been established under the NCD ICC to coordinate efforts across sectors
2. Non-Communicable Diseases and Injuries Lancet poverty commission defines the injuries landscape in the country and makes a set of recommendation for providing trauma care services in the country.
3. National Adolescent Health Policy, Adolescent health guidelines
4. Injury prevention and control unit in the CHV training module on NCDs

CHAPTER III: COMPREHENSIVE TRAUMA CARE SYSTEM: FUNDAMENTAL COMPONENTS OF TRAUMA CARE

A comprehensive trauma system consists of many different components that are integrated and coordinated to provide cost-effective services for injury prevention and patient care. At the center of this system is the continuum of care, which includes injury prevention, pre-hospital care, hospital, and rehabilitation care.

3.1 Pre-Injury/Injury Prevention

Violence and injuries are a serious public health problem affecting all age groups. There is need for a comprehensive approach to reverse this trend, largely through prevention. Prevention can be achieved through appropriate policy and legislation to address risk factors for injuries, awareness creation, appropriate infrastructure and environmental modification as well as establishing and enforcing safety standards. For each of these strategies, there are different roles which can be played collaboratively by the two levels of government and partners.

3.1.1. Policy Environment

Policy documents such as national strategies and plans of action are important for ensuring good planning, coordination and implementation of interventions

Role of National Government

- Developing and strengthening national legislations, policies, plans, regulations, standards and guidelines for violence and injury prevention and control
- Implementing national policies, plans, regulations and standards and guidelines for injury prevention and control
- Capacity building of all sectors on injury prevention
- Surveillance and reporting of violence and injury patterns
- Coordination of programs and partners involved in violence and injury prevention
- Establishment of a budget line and ensuring sustainable funding for violence and injury prevention at Ministry of Health and other line ministries.
- Dissemination of policy documents and information of public health concern
- Building the capacity of human resource for prevention of injuries

Role of County Governments

- Establish violence and injury prevention program with a dedicated budget line in funds allocation for sustainable financing
- Adapt and implement national policies, plans, regulations and standards and guidelines

for injury prevention and control.

- Ensure the human resource is adequate in number and appropriately skilled to implement violence and injury prevention programs including at the community.
- Collect data, analyze and report data in violence and injuries routinely

Role of Partners

- Provide both technical and financial support to programs
- Participate in policy development activities
- Advocate for continuous improvement of prevention efforts at all levels of government
- Synergize with government to accelerate implementation of priority programs

3.1.2. Awareness Creation

Health campaigns are used to raise awareness of important health issues and stimulate groups or individuals to seek information and services. Through any increase in knowledge, people can over time change their attitudes and longer term, particularly when other intervention programs are used, change their behavior¹⁹.

Role of National Government

- Development and dissemination of a communication strategy on injury and violence prevention
- Development and dissemination of Information, Education and Communication (IEC) materials on injury and violence prevention
- Spearhead nation-wide campaigns on violence and injury prevention
- Coordinate all actors on violence and injury risk reduction
- Develop tools for M&E of campaigns

Role of County Governments

- Domesticate the national communication strategy and IEC materials
- Ensure community participation in violence and injury risk reduction
- Implement public health campaigns on violence and injury prevention
- Carry out M&E of public health campaigns

Role of Partners

- Provide technical and financial support to government communication strategies and tools
- Participate in development, implementation and evaluation of campaign initiatives

3.1.3. Safety Standards

Safety standards are measures put in place on products, processes or activities to guard people from harm.

Role of National Government

- Develop national standards on prevention of injury in all environments including road infrastructure and building standards
- Develop standard operating procedures for high-risk environments
- Mainstream conflict resolution measures in all environments including road infrastructure
- Advocate for zero-rating of safety equipment (e.g fire-fighting equipment, protective gear, life vests)
- Develop curriculum on safety for all educational institutions
- Collaborate with relevant sectors including mental health actors to reduce risk of injury and violence.

Role of County Governments

- Adapt and implement national standards and SOPs on prevention of injury
- Educate the public on prevention of injuries

Role of Partners

- Provide both financial and technical support to governments
- Advocate for enhancement of safety in all environments
- Participate in the development, implementation and evaluation of safety standards

3.2. Pre – Hospital Care

Pre-hospital care is the immediate emergency medical interventions given to the ill and the injured before arrival at a health facility. Its provision is essential to saving lives and preventing further injuries, disabilities and fatalities. Emergency care in the country is guided by the Emergency Medical care policy.

The components of care entail:

Early detection: This involves identifying the existence of an incident. It can be enhanced through public education and awareness on what to look out for through basic first aid training, school health programs, public *barazas*, the media, community dialogue and action days.

Notification: Calling a hotline to request emergency response services by the first person to notice the existence of an incident. There should be one hotline as opposed to having many contact numbers. County and national hotlines need to be interoperable.

Dispatch/Response: This entails gathering relevant information, giving over the phone instructions, and sending appropriate resources including an ambulance unit, personnel, and equipment to the site. There is need to have a dispatch center at national and county levels

(Refer to Public Health Emergency Operations Centre policies and Standard Operating Procedures for guidance on specifications). The dispatch centre should map all available resources and have a directory of healthcare services. Health facilities should be ready to release ambulances and personnel when called upon.

On scene care: this involves scene size-up (a quick determination of the intensity of the injuries, safety of the patient, bystanders and health providers and need for additional resources like extrication support), triaging, stabilizing the patient, giving emergency care prior to transfer for definitive care. This is offered by trained first aiders, Emergency Medical Technicians (EMTs), nurses, clinicians and emergency physicians depending on severity of the injuries.

Field Triage Guidelines: Once the patient has been rapidly assessed by the pre-hospital team, a pre-defined, algorithmic decision tree is utilized to determine patient transfer destination, and communication pathways. This is critical to ensure the patient is transported to a facility capable of managing their injuries. Field Triage Guidelines can be given national oversight, and are to be contextualized by each county, and allow for rapid, uniform, predictable efficient patient transfer.

Transfer: All seriously injured patients shall be transferred in an appropriate ambulance, which can be BLS or ALS standards as specified in KEBS standard KS2429:2013. Basic life support ambulance is manned by at least one emergency medical responder and technicians, while advanced life support ambulance is provided by at least two advanced emergency medical technicians (AEMT), paramedics, critical-care nurses and clinicians. Ambulance operators also need at least first aid training. The ambulance should transfer the patient to appropriate nearest health facility.

Mass Casualty Triage: In mass casualty situations, the number of patients will usually exceed the number of emergency responders, ambulances and medical facilities. However, in a robust trauma system, mass casualty response starts with an augmentation of day-to-day functioning, and with an expectation to do the most good for the most number of people. Triage is therefore done to separate out minor injuries from critical ones, and reduce the urgent burden on healthcare facilities. During triage, four aspects are evaluated: (1) Ability to walk, (2) respiration, (3) blood circulation, and (4) mental status. The assessment takes less than 30 seconds for each victim. Based on assessment, casualties are placed into one of the following categories:

Acute condition (Red tag) - Mostly unconscious, with air circulation present after

positioning the airway. These kinds of patients require immediate evacuation.

Serious condition (Yellow tag) - These victims generally cannot walk, but can follow basic instructions, such as raising the arms. Their evacuation can be delayed.

Walking wounded (Green tag) - Minor conditions, requiring medical attention but victims are able to walk.

Deceased (Black tag) - No ventilation present after the airway is opened or presenting obvious signs of death like beheading.

3.3. Hospital Care

3.3.1. Level One: Community Health Services

General Description

Community services are mainly focused on demand creation for health services. They facilitate households to embrace appropriate healthy behaviors, provide agreed health services and recognize signs and symptoms of conditions requiring referral.

Staffing

- CHA
- CHVs
- PHOs
- Other Community-Owned Resource Persons (CORP)

Equipment

Basic first aid kit containing:

- Adhesive Strips (40)
- Cotton wool (Roll) 50gms (1)
- Crepe bandage 10cm (2)
- Crepe bandage 5cm (4)
- Crepe bandage 7.5cm (4)
- Iodine solution 200ml (1)
- Eye pads (8)
- Sterile gauze swabs 3'x3' (25)
- Sterile gauze swabs 2'x2' (25)
- Gloves-medium size (50pairs)
- Non-stick dressings (6)
- Pen and incident forms (1)
- Disposable face shield (1)
- Safety pins (12)
- Blunt sharp scissors (1)
- Splinter forceps (1)
- Sterile water 10ml (10)
- Adhesive plaster 2.5cmx5m1

- Triangular bandages (8)
- Universal shears (1)
- Wound dressing no.8 (3)
- Wound dressing no.9 (3)
- Clinical thermometer (1)
- Alcohol prep pad-5 (1)

Recommended Minimum Package of Trauma Services

1. Rapid trauma assessment of all injured patients
2. Basic first aid by the staff listed above
3. Standardized first response: Algorithmic patient triage and referral based on assessment
4. Facilitate referral to health facilities and back to the community for the injured, including re-integration
5. Offer home based care e.g. wound dressing.
6. Sensitization, awareness creation and health education to the community members on general safety measures and what to do in case of an injury.

3.3.2. Level Two: Dispensaries

General Description

Dispensaries offer preventive and promotive health services, linkage to community units and basic outpatient services.

Staffing

1. Nursing staff
2. CHAs
3. Support staff

Equipment

In addition to minimum infrastructure as defined in the MOh infrastructure Norms and Standards: Emergency trolley, AED, Scoop stretcher, evacuation kit

Commodities and supplies

In addition to minimum prescribed, dressing packs, suture packs, autoclave, non-pharmaceuticals, and essential medicines.

Recommended Minimum Package of Trauma Services

1. Advocacy, sensitization, awareness creation and health education on safety, prevention of injuries and what to do in case of an injury to the community
2. Basic life support for skilled staff: Basic first aid for support staff
3. Rapid trauma assessment of injured patients
4. Treatment of minor injuries e.g suturing
5. Appropriate referral following pre-determined algorithmic referral protocols
6. Stabilization and patient preparation for efficient transport
7. Facilitate linkages and support to community units
8. Function as a pre-hospital care hub
9. Data collection and reporting in national trauma registries
10. Offer counseling and psychosocial services

3.3.3. Level Three: Health Centers

General Description

This level of health care provides: preventive and promotive health services; linkage to community units; basic outpatient diagnostic, medical, surgical & rehabilitative services; ambulatory services; and inpatient services for emergency clients awaiting referral and clients for observation. These facilities are optimally geographically located to take on the majority of the front-line burden of trauma care, and thus will benefit from capacity building program. Their role within the trauma system will be rapid assessment, stabilization and activation of regional trauma teams as necessary. They will also be responsible to manage the vast majority of injured patients not requiring transfer.

Staffing

1. Medical officers
2. Nursing staff
3. Clinical officers
4. Laboratory technologists
5. Pharmaceutical technologists
6. Community oral health officers
7. Radiographer
8. Counsellor
9. Orthopedic trauma technologist
10. Orthopedic technologists
11. Physiotherapist
12. Occupational therapist
13. HRIO
14. Support staff

Equipment:

In addition to basic minimum as defined in the MOH infrastructure Norms and Standards: basic x-ray, ambulance

Commodities & supplies:

In addition to minimum as defined in the Kenya Essential Medical Supplies list: dressing packs, suture packs, tourniquets, autoclave, non-pharmaceuticals, essential drugs, lab reagents

Recommended Minimum Package of Trauma Services

1. Co-ordination with the pre-hospital care team
2. Clinical and radiological diagnosis of trauma and basic laboratory services
3. Basic Life support certification for skilled cadre and basic first aid for support staff
4. Minor surgery
5. Rehabilitative services and application of plaster/ splints
6. Appropriate referral following pre-determined algorithmic referral protocols
7. Ambulance services
8. Data collection and reporting through trauma registries
9. Counseling and psychosocial services

3.3.4. Level Four: Primary Referral/Sub-County Hospitals

General Description

These facilities offer comprehensive diagnostic, medical, surgical and rehabilitative care. They also provide specialized outpatient and in-patient services, with case management up to general surgery level. They facilitate and manage both vertical and horizontal referrals. In a decentralized, coordinated trauma system, these facilities play a role as regional definitive care centres, engaged to assess, diagnose, and manage severely injured trauma patients, including life-saving interventions, rehabilitation, and out-patient follow-up.

Staffing

- | | |
|--|-----------------------------|
| 1. General surgeon | 11. Pharmacist |
| 2. Obstetrician & gynecologist | 12. Dental technologist |
| 3. Anesthesiologist | 13. Dentist |
| 4. Anesthetists | 14. Physiotherapist |
| 5. Orthopedic trauma technologist | 15. Orthopedic technologist |
| 6. Medical Officers | 16. Occupational therapist |
| 7. Clinical officers (general and specialized) | 17. HRIO |
| 8. Nursing staff | 18. Social worker |
| 9. Lab technologist | 19. Counselor |
| 10. Radiographer | 20. Medical engineer |
| | 21. Support staff |

Equipment

Fully fledged Accident and Emergency unit

Commodities & supplies

What is available in level 3 plus what is provided for in the KEML

Standard Operating Procedures: Trauma guidelines & protocols accredited locally & internationally

Recommended Minimum Package of Trauma Services

1. Co-ordinate with the pre-hospital care team
2. Have Mass casualty incident (MCI) plans
3. All cadres in A&E unit should have BLS & ATLS certifications or accepted equivalent
4. Appropriate referral following pre-determined algorithmic referral protocols
5. Capacity building and human resource support for primary care facilities (level 1-3)
6. Facility disaster response planning and management
7. Diagnostic services
 - Imaging with at minimum X-ray machine, Ultrasound, CT Scan, MRI
 - Full Laboratory services
 - Blood bank and transfusion services
8. Definitive care:
 - Basic surgical procedures: e.g., Laparotomy, fracture closed and open fixation in children and adults, neurosurgery
 - HDU & ICU
 - Rehabilitation services
9. Ambulance services as per the EMS policy
10. Data collection and reporting in trauma registries
11. Counseling and psychosocial services
12. Research and training on basic trauma management

3.3.5. Level Five: Secondary/County referral health facilities

General Description

These facilities offer predominantly specialized services beyond general surgery and act as training institutions. An expected outcome of a robust, decentralized trauma system is a significant off-loading of trauma burden from these centres. Less injured patient will be more

likely to be managed a lower level of care centres. Algorithmic referral and transfer guidelines ensure the right patients reach this level of specialized care.

Staffing

In addition to the staff at level 4

- All surgical specialists:
 - Neurosurgeons
 - Pediatric surgeons
 - Maxillofacial surgeon
 - Plastic surgeon
 - Ophthalmologist
 - Ear Nose and Throat specialist (ENT)
 - Cardiothoracic surgeon
- Nursing staff (critical care, A&E specialization)
- Support staff

Recommended Minimum Package of Trauma Services

All the services available in level 4 PLUS

- Specialized surgical trauma services
- Burns unit services
- Intensive Care Unit services

3.3.6. Level Six: National/Tertiary Referral Health Facilities

General Description

These are service units providing highly specialized services including sub-specialty disciplines, reference laboratory support, blood product services, training and research.

Recommended Minimum Package of Trauma Services

Services available in level 5 PLUS

Definitive care:

- Complex specialized services; complex pelvic injury management
- Pediatric and neonatal critical care services
- Surgical ICU

3.3.7. Trauma Centers

This Framework proposes integration of trauma services in existing levels of health facilities as outlined above rather than stand-alone trauma centers. However, health facilities serving high burden areas can be supported to establish comprehensive trauma units or strengthen their trauma care capabilities. The high cost for additional human resources and infrastructure to only handle trauma fails to justify the need for stand-alone trauma health facilities in the public sector. Where there is a need to construct a trauma facility, this shall integrate other services depending on the disease burden of the host community to maximize efficient use of resources.

3.4. Rehabilitation

3.4.1. Community-based rehabilitative services

General Description

Community based rehabilitative (CBR) services are focused to enhance the quality of life for people with disabilities and their families. The aim is to restore function after trauma at community level after hospital visits. CBR is implemented through the combined efforts of people with disabilities, their families and communities, and relevant government and non-government health, education, vocational, social and other services.

Recommended Minimum Package

1. Training of caregivers on basic rehabilitation care
2. Training of Persons With Disabilities (PWD) on activities of daily living
3. Sensitization of community members on reducing stigma towards PWDs
4. Integration of PWDs into the community
5. Prevention of deformities by Splinting, exercises, positioning
6. Restoration of joint function
7. Maintenance of prosthesis and orthotics
8. Management of pain by soft tissue manipulation, exercises
9. Provision (measuring and fitting) of ambulatory aids
10. Identification and referral of unattended trauma cases to the hospital

Personnel

1. CHA

2. Community Health Volunteers
3. Occupational Therapist
4. Orthopedic Technologist
5. Physiotherapist

Equipment

1. Goniometer
2. Tape measure
3. BP machine
4. Massage medias

3.4.2. Level 2 and 3

General Description

Rehabilitative management of acute and sub-acute soft tissue injuries and chronic traumatic conditions

Minimum Package of care

1. Training of caregivers on basic rehabilitation care
2. Training of PWDs on activities of daily living
3. Application of RICE- rest, ice, compression, elevation
4. Prevention and management of deformities by splinting , exercises, positioning
5. Pain management-Heat therapy, manipulations and exercises, Trans- cutaneous Electric Nerve Stimulation (TENS)
6. Restoration of joint function
7. Maintenance of prosthesis and orthotics
8. Management of pain by soft tissue manipulation, exercises
9. Provision (measuring and fitting) of ambulatory aids
10. Referral of complicated cases

Personnel

1. Occupational Therapist
2. Orthopedic Technologist
3. Physiotherapist

Equipment

1. Goniometer
2. Tape measure
3. BP machine
4. Massage medias

5. Cool boxes-freezer
6. Hydrocollator/hot pack
7. Crepe bandages
8. Tens machines

3.4.3. Level 4

General Description

Rehabilitative management of acute and sub-acute soft tissue injuries, chronic traumatic conditions and conservative management of fractures

Minimum Package

1. All services offered in level 2 and 3
2. Provision and maintenance of prosthesis and orthotics
3. Provide Pre-rehabilitation services prior to surgery
4. Prevention of cardiopulmonary complication
5. Management of nerve related injuries
6. Conservative management of fractures -Application of POP

Personnel

1. Occupational Therapist
2. Orthopedic Technologist
3. Physiotherapist
4. Plaster Technicians

Equipment

1. Goniometer
2. Tape measure
3. BP machine
4. Massage medias
5. Cool boxes-freezer
6. Hydrocollator/hot pack
7. Crepe bandages
8. Tens machines
9. Ambulatory aids
10. Plaster
11. Plaster cutter

12. X-ray films
13. Therapeutic gym equipment

3.4.4. Level 5

This level will focus on specialized services for rehabilitative management.

Minimum Package

1. All services offered in level 4
2. Provision and maintenance of prosthesis and orthotics
3. Intermittent traction
4. Chest physiotherapy

Personnel

1. Occupational Therapist
2. Orthopedic Technologist
3. Physiotherapist
4. Plaster Technicians

Equipment

1. Goniometer
2. Tape measure
3. BP machine
4. Massage medias
5. Cool boxes-freezer
6. Hydrocollator/hot pack
7. Crepe bandages
8. Tens machines
9. Plaster
10. Plaster cutter
11. X-ray films
12. Traction Machine
13. Gym equipment

3.4.5. Level 6

At this level of care rehabilitative management of complex cases will be offered

Minimum Package

1. All services offered in Level 5
2. Hydrotherapy
3. Speech therapy

Personnel

1. Occupational Therapist
2. Orthopedic Technologist
3. Physiotherapist
4. Plaster Technicians
5. Speech therapist

Equipment

1. Goniometer
2. Tape measure
3. BP machine
4. Massage medias
5. Cool boxes-freezer
6. Hydrocollator/hot pack
7. Crepe bandages
8. Tens machines
9. Plaster
10. Plaster cutter
11. X-ray films
12. Traction Machine
13. Gym equipment
14. Hydropool with floaters

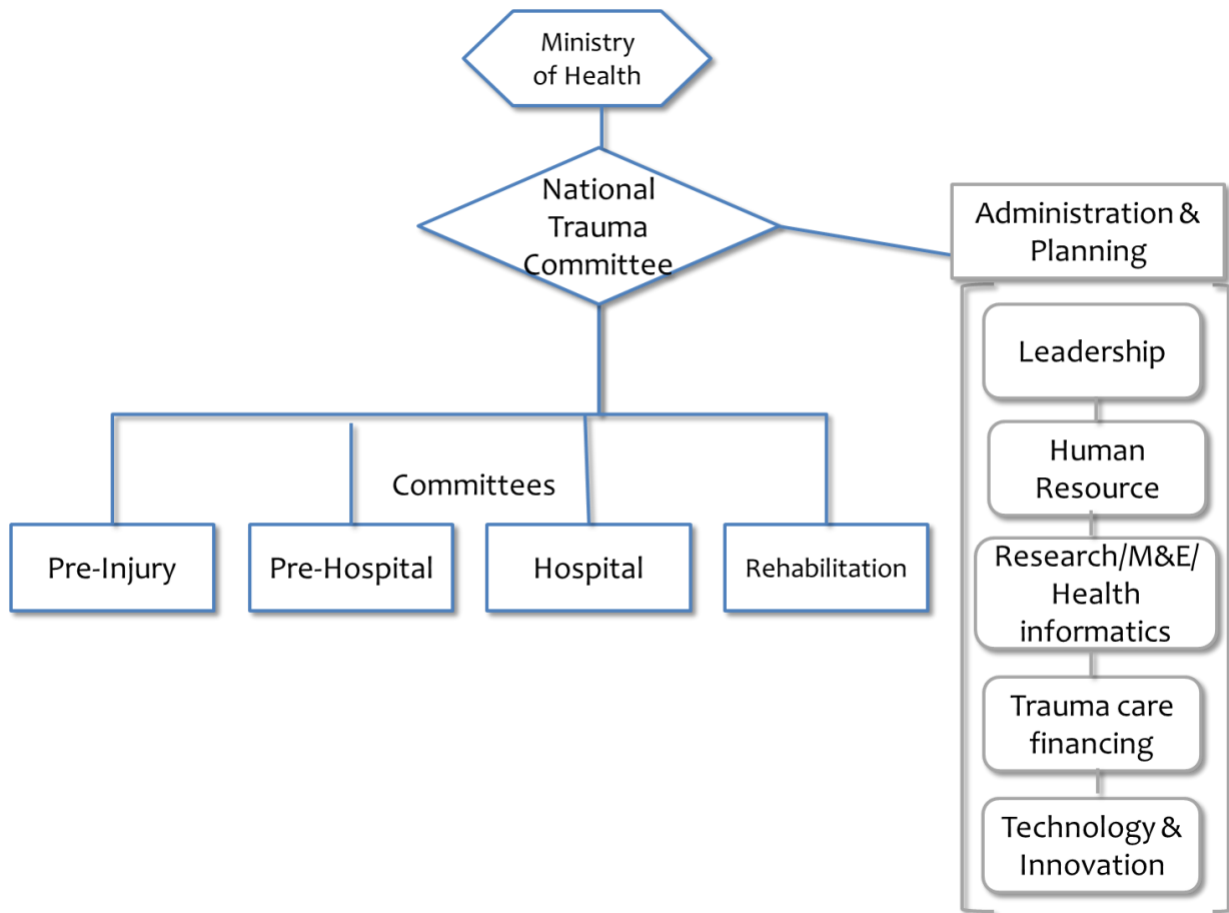
CHAPTER IV: ESSENTIAL TRAUMA CARE INVESTMENTS

The investments in a trauma care system include six key elements: leadership & governance, human resources, information management, financing, technology & innovation and quality improvement. In a model system, these elements are integrated and coordinated to provide cost-effective and appropriate services across the continuum of care.

4.1 Leadership and Governance

A lead agency both at national and county level that has the authority, responsibility, and resources required to lead the operations, and evaluation of the trauma injury framework. There is a critical need for such a lead agency that is recognized and accepted by the full range of health and other stakeholders as the party responsible for trauma framework development and implementation. The fragmentation of trauma leadership is a potential impediment to the implementation of a national framework.

A National Trauma System Leadership Committee will be developed to advocate for system development, serve as the locus for policy development and support, and coordinate the work of government agencies and professional organizations with injury-related programs. The Committee would represent a partnership among private organizations and governmental agencies (national and subnational) and would include representatives of all major stakeholder groups, including public and private players. The Leadership Council will help formulate national trauma system standards and optimal resources guidelines for trauma prevention, and ensure implementation of the recommendations set forth in this Trauma Framework.



4.1.1 National Trauma Committee

The National Trauma Committee shall constitute of representation from state and non-state actors.

- State: Ministry of Health, other relevant ministries (Interior, Transport) and County Governments/Council of Governors
- Non state:
 - ✓ Professional association dealing with trauma and psychosocial support
 - ✓ Private sector: Kenya Healthcare Federation
 - ✓ Development Partners in Health, Kenya (DPHK): WHO and other relevant development partners
 - ✓ Other expert organizations and Non-Governmental Organisations (NGO)

The Committee shall have the following sub-committees:

1. Pre-injury
2. Pre-hospital

3. Hospital
4. Rehabilitation
5. General administration and cross-cutting issues
 - Infrastructure
 - Health Information
 - Research and M&E
 - Financing
 - Technology and Innovation
 - Training

Membership of sub-committees will be dependent on expertise. Members of the sub-committees don't have to be members of the main Committee.

4.1.2 County Level Structures

All counties will establish a Lead Agency/County Trauma Committee with representation from various stakeholders to coordinate and administer trauma framework implementation.

4.1.3 Sub-County Level Structures

- Lead agency/Committee at county level shall be replicated at sub-county level
- This shall coordinate trauma care services at primary level facilities and community health services

4.1.4 Health Facility Structures

4.1.4.1 Trauma Team Organization

- Constitution/composition of trauma teams- This will be a multidisciplinary group
- Functions of trauma teams e.g. Each member of the team should have pre-assigned roles
- Operations of the trauma team, including incident management and incident command etc.
- Reporting of Trauma Team activities through validated tools

4.1.4.2 Secondary and Tertiary Level Health Facilities

- Emergency committees are already in existence in health facilities and largely handle trauma care- especially acute cases. Trauma committees should be created to provide the entire continuum of trauma care.
- Members with pre-assigned roles
- Composition
 - ✓ Lead surgeon
 - ✓ Emergency doctor
 - ✓ Clinical officers with training on trauma
 - ✓ Emergency nurse
 - ✓ Anesthesiologist/Anesthetist
 - ✓ Radiographer
 - ✓ Phlebotomist/Laboratory technologist
 - ✓ Pharmacist
 - ✓ Orthopedic trauma technologist
 - ✓ Theatre manager
 - ✓ Health Records and Information Officer (HRIO)

4.1.4.3 Primary Level Health Facilities

- At health center level, the trauma team shall be composed of:
 - ✓ Facility-in-charge
 - ✓ Nurse
 - ✓ Orthopedic trauma technologist/physiotherapist
 - ✓ Laboratory technologist
 - ✓ Radiographer
 - ✓ HRIO
- At dispensary level:
 - ✓ Facility-in-charge
 - ✓ CHEW
 - ✓ Lab Tech

4.2 Human Resources for Health

Personnel shortages are rampant throughout the health care system locally and globally. This problem is particularly acute in the field of trauma care, ranging from availability, adequacy and skills of health workers and pre-hospital providers. This framework envisions that:

- Human resources for trauma will be patient focused and team oriented.
- Creative opportunities for recruitment and retention of personnel in trauma care will be explored.
- Incentives for all types of providers will be appropriate and sufficient so as to encourage participation in trauma care.
- Incentives for attracting trauma specialization, including addressing the burden of liability, will be explored.
- Ongoing professional education opportunities will be available and accessible.
- Volunteers will supplement career resources and will be enlisted to promote injury prevention as well as deliver care.

4.2.1 Recommended in-service/short-course trauma training

Cadre	Required basic trauma skill-sets/competencies	Proposed training program/course and training methodology	Proposed accreditation/accrediting body
Community Health Extension Workers(CHEWS), Community Health Volunteers (CHVs) Hospital Support staff	Health education and promotion skills on prevention of injuries and complications Home based care Basic First aid	Basic first aid Road Safety – everybody is a road user Home-base Care Training of Trainers Live drills & simulations CHV training module for injuries “Emergency training for the community worker”	Directorate of Occupational Safety and Health(DOSH) National Trauma Committee
EMTs, Paramedics,	Basic life support, safe patient transportation	Emergency Medical Technician (EMT)	Emergency Medical Care Council

		<p>Paramedicine</p> <p>Basic Life Support (BLS)</p> <p>Emergency Transport Attendant Course (ETAC)</p> <p>Emergency Vehicle Operators Course (EVOC)</p>	
Ambulance Drivers	Basic life support, safe patient transportation	<p>Emergency Medical Technician (EMT)</p> <p>Emergency Vehicle Operators Course (EVOC)</p>	Relevant body in Emergency Medical Care
Nurses	Advanced trauma life-support	<p>ATLS</p> <p>Advanced Trauma Care for Nurses</p> <p>Trauma Teams Training</p>	American College of Surgeons
Trauma Nurse	Trauma management	Accident & emergency Nursing Course	Nursing Council of Kenya
Clinical Officers	Advanced trauma life-support	<p>ATLS</p> <p>Trauma Teams Training</p>	American college of Surgeons
Physiotherapist/ Occupational therapist/ Orthopedic trauma technicians & Orthopedic technologists	Fracture management	<p>Trauma Teams Training</p> <p>BLS</p> <p>Non operative fracture management</p>	<p>American Heart Association</p> <p>AO foundation</p>
Medical officers	Advanced trauma life-support	<p>Trauma Teams Training</p> <p>ATLS</p> <p>Point Of Care Ultrasound (POCUS)</p>	<p>Canadian Network for International Surgery</p> <p>American college of Surgeons</p> <p>Trauma Council</p>

Surgeons/Specialists	Advanced trauma life-support	ATLS Trauma Teams Training Definitive Surgical Trauma Care trauma course Surgical training for austere environment Strategies for Managing Abuse Related Trauma (SMART)	American College of Surgeons Canadian Network for International Surgery
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4.3 Financing of Trauma Care

Costs related to trauma care are incurred by multiple actors within a trauma system including the injured and their families, public agencies, pre-hospital providers, acute care providers, rehabilitation providers and the society at large. Trauma services will be recognized as a public good and therefore valued and adequately funded not only for the clinical care they actually deliver, but also for the level of readiness required to meet the needs of all injured persons. Trauma care shall be integrated in the public supported financing system under Universal Health Coverage programming administered at the national and county level.

- This Framework shall provide for costing of trauma care services – aggregated cost as well as cost by level of care to inform planning, including UHC and insurance capitation/reimbursements
- There will be ongoing dialogue and review regarding the cost-effectiveness of trauma care systems.
- Clearly define the benefit package for trauma care in UHC – Should cover the aspects provided for in this framework – from pre-hospital care, hospital care and rehabilitation.
- A system will be created for reimbursing providers for uncompensated trauma care without cost shifting to non-governmental payers. This shall be achieved through operationalization of the emergency medical fund provided for in the Health Act 2017.

- There will be dedicated funding for trauma system infrastructure costs.
- Create linkages with other state departments that deal with emergencies and trauma for financing during disasters, as well as prevention measures that cut across multiple sectors
- Strengthen linkages with non-state agencies who fund trauma and leverage on Public-Private Partnerships
- Encourage enrolment with NHIF. Strengthen and standardize trauma package
- Enforcement of comprehensive insurance for motorists, work places etc.
- Opportunities for trauma technologies development for the Kenya context, from Kenyan and global medical device entrepreneurs.
- Other innovative ways of financing trauma care
 - ✓ A percentage of insurance premiums to cater for trauma care
 - ✓ Road levies
 - ✓ Fuel levies

4.4 Technology & Innovation

Technology plays an important role in the organization, delivery, and effectiveness of trauma services, and it will continue to do so in the future. Recent developments such as such as Global Positioning Systems (GPS) and wireless technology could bring beneficial information to dispatch centers, while the nascent field of telemedicine holds great promise for providing trauma care in remote locations.

Barriers to the use of technology in medicine do exist. There is often little up-front medical consideration in technology development, and financial resources for technology development are not always adequate. There is a need for continual development, with benefit of technology effectiveness studies. There is also a need for interoperability in communications technology.

Medical input will be sought early in the design phase of future technologies to ensure that these developments are coordinated with the health care system and result in improved patient outcome. Engagement of the growing number of global and Kenyan medical device start-ups and entrepreneurs may have economic benefit for the region, as this is a largely untapped market, with great need.

This Framework envisions that:

- Automotive telematics systems and GPS applications in motor vehicles will be used to locate crashes. GPS will also provide real-time route navigation for ambulances.
- Telemedicine will be used to provide services remotely. For example, video feeds will be used to provide telemedicine to rural areas and enable remote providers to perform operative procedures and patient follow up. EMS providers will have direct communication to medical providers.
- E-learning platforms to support continuous professional development and training
- Robotic and diagnostic intervention will be conducted via telemedicine
- Teleconferencing will be used for education, outreach, and policy development.
- Monitoring devices will be used in a variety of settings, including skin sensors to monitor patient's vitals and the use of physical monitoring devices in a patient's home, which would support injury prevention and rapid response.
- Access number will be consolidated to eliminate confusion and streamline access nationwide.
- Patient simulation technology will be used for provider education.
- Dedicated resources will be available for technology research, development implementation, analysis and evaluation.

4.5 Information Management

Information management should be a cornerstone of the trauma care system enabling research, care management, and performance improvement. Trauma data registries should exist at the national and county levels that are preferably internet linked and universal. Evidence regarding the overall value of trauma care as well as for data regarding the contribution of individual components of a trauma system and what value each provides to the effectiveness of the system is vital. Additionally, better data is needed in order to garner support from legislators and local policy makers for increased prioritization and funding.

This framework envisions:

- Interlinking of Electronic Medical Records (EMRs) across facilities to aid in ease of patient information retrieval and to avoid duplication of patient assessments/investigations during referrals
- Linkages of different data collection systems including EMRs and the country's central health information system (DHIS2/KHIS)

- A national database and uniform data standards will be used to facilitate hospital operations and provide regional and national information regarding availability of post-hospital care.
- Information related to the complete cycle of trauma-from prevention to post-hospital care-will be collected, analyzed, and made available to facilitate improvements in injury prevention, response times, patient care, and rehabilitation
- A standardized training course will be used to enable trauma registrars to collect and categorize data in a consistent, comparable manner. Including pre-service and in service training on standardized coding and certification of injuries and deaths
- Advocate for trauma specific module in DHIS
- Development and standardization of data collection tools
- Access to and appropriate protection of patient records and quality improvement data will be addressed through legislative and regulatory changes at county and national levels
- Adequate mechanisms should be put in place to address issues of data security, mining of retrospective data and data ownership

4.5.1 Research and Development

Research can greatly facilitate evidence-based revision on clinical and basic science approach to trauma, so as to make policy and legislation development, planning and quality improvement initiatives more effective.

The framework envisages:

- Development of a national trauma research agenda that will be adhered to by all
- Agencies involved in or funding trauma research will be coordinated through a formal institutional process
- Mechanisms will be put in place to ensure data ownership and sharing policies are well spelt out
- There will be formal efforts to interest young professionals in trauma research and there will be sponsored training programs in all types of research
- Types of research conducted will include fundamental basic research, crash investigation research, evidence-based medicine, best practices, clinical trials, clinical guidelines, and health services and systems research
- Curated global partnerships could be sought, with ethical standards in place to ensure

Kenyan interests are protected

- Efforts to enhance patient confidentiality should be balanced with the need for strong research
- Have a repository for research findings and dissemination strategy
- Knowledge management information for trauma care research will be prioritized

4.5.2 Monitoring and Evaluation

Monitoring and evaluation helps improve performance and achieve results. The goal is to improve current and future management of outputs, outcomes and impact. It establishes links between the past, present and future actions. Human and other necessary capacities will be strengthened to facilitate timely processing and analysis of the data collected

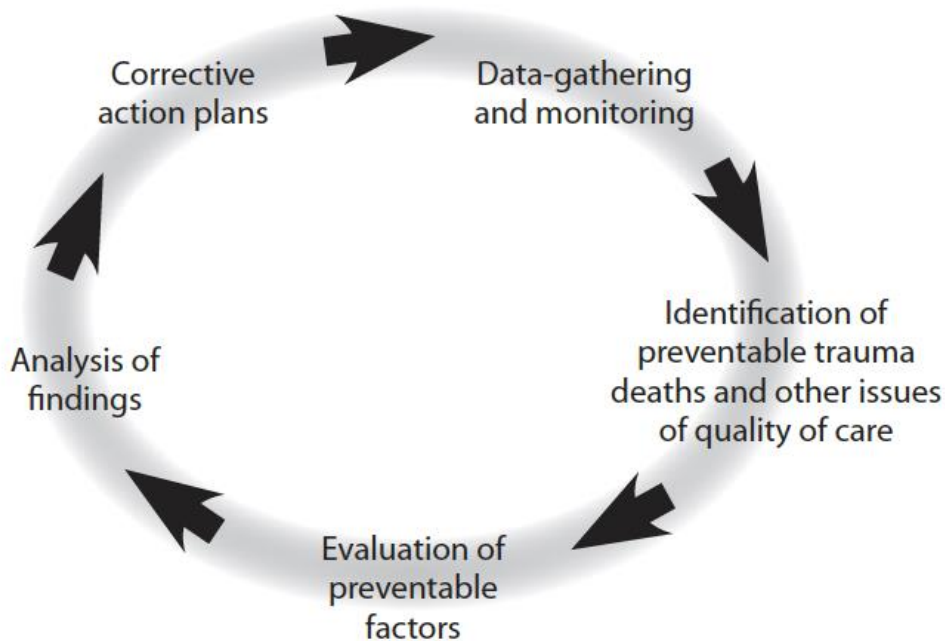
This Framework envisages to:

- Strengthen routine documentation in health facilities, including proper coding of trauma diagnoses and certification/notification of deaths
- Streamline data collection tools and aggregation in the health management and information system/trauma registries
- Integrate trauma data quality analysis (DQA) into the routine quarterly DQA
- Integrate trauma indicators into the quarterly support supervision tools
- Include trauma indicators in data review meetings
- Strengthen trauma indicators in national surveys e.g., the SARAM

4.6 Trauma Care Quality Improvement Program

Continuous trauma care quality improvement programs offer a practical means to elevate the quality of care for trauma patients. It looks at the structures (people, education and equipment), process (protocols, policies and procedures) systems (programs, organization and culture) to ensure there is patient satisfaction, quality services and safety²⁰. This is achieved by collecting data from trauma centers, providing feedback and identifying institutional characteristics that the trauma health care workers can implement in improving patient outcomes. It also provides education and training to help staff improve the quality of care.

The quality improvement process can be summarized in the figure below:



This Framework envisages:

- Identification of preventable, potentially preventable deaths and disabilities
- Development, implementation and monitoring of the implementation of trauma care protocols and procedures
- Ensuring availability of equipment and regular maintenance and calibration
- Ongoing trauma specific in-service training and basic competencies in primary trauma care
- Clinical audits/mortality reviews
- Process reviews e.g. time-to-definitive care, referral services etc. and feedback reports
- Efficient implementation of corrective actions identified
- Customer feedback

CHAPTER V: IMPLEMENTATION FRAMEWORK

5.1 Roles of Different Stakeholders in the Implementation of the Framework

5.1.1 Ministry of Health

- Sensitization of policy makers and legislative bodies at national and county levels on the trauma care framework
- Policy development, review of existing policies to align with the provisions of this framework
- Policy dissemination to counties and all stake holders
- Capacity building with regards to the counties
 - Infrastructure:
 - Expansion of the National Government Equipment support programs
 - Allocation of equipment based on need as per the framework provision.
 - Ensure facilitation of service and maintenance of equipment.
 - Ensure end-user training on the equipment.
 - Human Resource:
 - Ensure counties, private and Faith Based Organizations (FBOs) adhere to human resource norms and standards listed in the framework.
 - Ensure personnel working in trauma settings have the basic skills and competencies as stipulated in the framework.
 - Standardization of pre and in-service on trauma training.
 - Fund for trauma training.
 - Data management
 - Review trauma related indicators and integrate these into existing routine data management tools and DHIS.
 - Coordinate data management across the country.
 - Set the research and development agenda for trauma in the country.
 - Ensure data security.
 - Ensure data collection ownership by government and approve before dissemination
 - Ensure dissemination of data management tools to counties and all stakeholders.
 - Provide national trauma care status via reports, individualized feedback to counties, biannual review meetings with county and other stakeholders.
 - Develop trauma care dashboard
- Ensure trauma care governance, and coordination structures outlined in this framework are implemented across all levels.
- Set the agenda for technology and innovation in trauma care.

- Offer guidance to NHIF to cover all trauma care services as stipulated in this framework.
- Operationalize the emergency medical fund as provided for in the Health Act 2017.
- Ensure integration of the provisions in the trauma care framework into UHC.
- Monitor the implementation of the Trauma care framework.
- Ensure continuous trauma care quality improvement.

5.1.2 County Governments

- Sensitization of all stakeholders in the county on the trauma care framework
- Implement the provisions of this trauma care framework
- Develop trauma care structures as outlined in the framework
- Allocate and avail adequate finances for trauma services, infrastructure and commodities provided for in this framework
- Ensure adequate personnel are working in trauma settings and have the basic skills and competencies as stipulated in the framework
- Ensure Trauma guidelines and protocols are available in all the health facilities and community units.
- Ensure adherence of the trauma guidelines and protocols as stipulated in the framework
- Ensure timely, complete and quality data collection, transmission and utilization at county level.
- Integrate trauma care indicators in routine support supervision, facility in-charges meetings and quarterly review meetings
- Ensure continuous professional development in trauma care
- Ensure continuous quality improvement for trauma care
- Designate trauma centers of excellence/defined pathway for trauma care in consultation with the national government

5.1.3 Other Line Ministries

Trauma as a result of violence and injuries has resulted in a huge national burden that is pervasive due the multi-sectoral dimensions involved. In order to reduce the occurrence of injuries, government ministries must work together towards this. The following are the ministries involved in the effective implementation of the framework:

- Ministry of Transport, Infrastructure, Housing, Urban Development and Public Works

- Implement the existing local and international strategies on transport safety that Kenya has assented to.
- Enforce existing regulations for transport safety
- Environmental modification to prevent injuries e.g. foot bridges, speed calming measures such as speed bumps, humps and rumbles etc.
- Ministry of Interior and Coordination of National Government
 - Enforcement of laws and regulations pertaining to safety
 - Linkage of policies on safety between the community and other line ministries
 - Enhancement of general security in communities
 - Implementation of disaster risk management strategy
- Ministry of Education
 - Implement and review the injury prevention content in training curriculum
 - Implement safe school environment policy within schools
 - Facilitate rehabilitative services after trauma within schools
- Ministry of Water and Irrigation
 - Educate the public on prevention of drowning
 - Enforcement of regulations to protect the public from injury
- Ministry of devolution and planning
 - Implementation of disaster risk management strategy
- National Treasury
 - Secure and allocate funds towards implementation of this framework
- Ministry of Lands and Physical Planning
 - Enforcement existing regulations on safety standards
- Ministry of Sports and Heritage
 - Educate the public on risks for injury and the need to utilize health services
 - Debunk myths and cultural practices that result in violence and injuries
- Ministry of Agriculture, Livestock and Fisheries
 - Education of farmers on safe use of pesticides and avoidance of self-harm
 - Safe animal handling-animal bites, animals on roads
 - Educate on safe handling of farm equipment
- Ministry of Information, Communication and Technology
- Ministry of Labor and Social Protection
 - Occupational health and safety including ergonomics

- Kenya Wildlife Service – Animal bites and attacks
- Kenya Bureau of Standards
 - Standards of machinery and equipment

5.1.4 Development Partners

Development partners help to support governments to attain development goals through various forms of assistance including:

- Support implementation of government strategies on injury prevention and control
- Financing projects that advance government priority interventions on injury prevention and control
- Training of health workers in trauma care (Emergency Room Trauma Care (ERTC) and War Surgery Course - WSC)

5.1.5 Private Sector, Faith-Based Institutions, Civil Society and Non-Governmental Organizations

- Mobilizing human and financial resources for trauma care service delivery
- Training and capacity building of health workers and community health personnel
- Research and sharing of information
- Dissemination of the trauma care framework
- Actual management and referral of trauma victims
- Advocacy, awareness creation and public education
- Advocate for and/or provide for medical insurance for trauma care
- Advocate for expansion the benefits of motor insurance to cater for care of trauma victims (road traffic crash)

5.1.6 General Public

These are the beneficiaries of policies and regulations on violence and injury prevention and are actors of first response in some scenarios. Their roles include:

- Comply with the law and regulations on safety
- Advocate for safe environments
- Apply knowledge and skills imparted on safety

CHAPTER VI: Monitoring and Evaluation of the Framework

Monitoring and evaluation of this framework shall be done in order to promote its implementation and strengthen trauma care in Kenya. The process of monitoring and evaluation will be done through tracking indicators and targets at defined time intervals by all relevant stakeholders.

Activities

1. Put in place adequate surveillance systems to monitor the delivery of trauma care and track the implementation of this framework
2. Modify existing tools, quality assurance tools and continuous quality improvement tools for monitoring the impact of this framework and assessing the achievement of the highest attainable standard of trauma care.
3. Develop annual work plans to monitor and implement this framework.
4. Conduct annual review meetings to track progress of implementation of framework, identify gaps and come up with solutions
5. Analyze the results of the monitoring processes and package the feedback for the relevant stakeholders, the public and other interested parties through policy briefs among other appropriate means.
6. Conduct regular support supervision and data quality audits to monitor implementation of the framework

Progress Monitor

Domain area		
Impact	Mortality	Reduce trauma related mortality by 5% annually
	Morbidity	Reduce trauma related morbidity by 01% annually
System Issues	Financing	Increase funding for trauma care by 10% annually
	Human resource	Increase number of HCW trained on trauma care by 15% annually
	Technology	Integrate EMRs on Trauma care to a central system
	Information Systems	Increase data accuracy by 10% annually

	Infrastructure	Increase the proportion of facilities with requisite trauma care infrastructure by 10% annually
	Leadership and Governance	Increase the proportion of facilities with designated trauma care teams by 10% annually
	Service Delivery	Increase the proportion of facilities offering essential trauma care services by 10%

Note: Figures for mortality, morbidity and disability may in fact increase for the first up to 3 years while the system and framework are being introduced and improved data collection and system utilization takes place.

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APPENDICES

APPENDIX A: LIST OF CONTRIBUTORS

Name	Organization
Dr. Waqo Ejersa	Ministry of Health
Dr. Gladwell Gathecha	Ministry of Health
Dr. Joseph Kibachio	Ministry of Health
Dr. Daniel Ojuka	University of Nairobi/Surgical Society of Kenya
Dr. Peris Waithiru	Kenya Orthopedic Association/Thika Level 5 Hospital
Dr. L.M Thiga	Ministry of Health
Dr. Oren Ombiro	Ministry of Health
Nargis Kaka	Nursing Council of Kenya
Dr. Kizito Shisanya	Surgical Society of Kenya/Nakuru County
Dr. Abdullah Saleh	International Canadians for Change
Dr. Harvey Hawes	International Canadians for Change
Dr. Musa Mohammed	Nairobi Metropolitan Services
Dr. Loise Nyanjau	Ministry of Health
Dr. Joyce Nato	WHO
Dr. Tesfaye Makonnen Felike	International Committee of the Red Cross (ICRC)
Dr. Grace Kariuki	Ministry of Health
Dr. N.O Tinega	Mbagathi Hospital
Dr. Makau Matheka	Ministry of Health
Dr. D.G. Kinyanjui	Kenyatta National Hospital
Dr. Jeremy Gitau	Emergency Medicine Kenya Foundation
Dr. Grace Muthoni	Emergency Medicine Kenya Foundation
Dr. D. Karuri	Kapenguria County Referral Hospital
Dr. Alex Njiru	Mater Hospital
Dr. Andrew Were	Kenya Society for Plastic Surgery
Dr. Aysha Edwards	Nairobi Hospital
Jacklyne Obonyo	Ministry of Health
Benn Mugoh	Machakos County
Beth Gichohi	Kiambu County
Fred Majiwa	St. John Ambulance
Scholastica Mwendu	Ministry of Health
Anne Kendagor	Ministry of Health
Dr. Nzisa Liku	Ministry of Health
Stephen Khamisi	MP Shah Hospital
Emily Nyagaki	Emergency Medicine Kenya Foundation
Grace Onchwari	Ministry of Health
Dr. J. Njoroge	NHIF
Isaiah Sarara	Mbagathi Hospital
Veronicah Njeri	Nairobi Hospital
Dr. Supa Tunje	Kenya Medical Association
Judy Kabathi	Ministry of Health
Edith Kabure	CALS-Kenya
Betty Kiruki	Ministry of Health
Dr. Nasirumbi Magero	Ministry of Health
Perez Obonyo	Gertrude's Institute of Child Health
Treazer Ogumbo	Ministry of Health
Rose Kirruti	Kiambu County
Richard Kabiru	Ministry of Health
Felistus Musyoka	Nairobi County

Appendix B

Appendix B. Minimum Data Elements for a Trauma Information Systems

The table below highlights the minimum data set to be collected for a trauma information system

Age	Disposition from Casualty
Sex	Admission BP
Date and Time of injury	Admission GCS
Mechanism of injury	Pre-hospital transport
Predominant region of injuries	Length of Stay (days)



DIVISION OF VIOLENCE AND INJURY PREVENTION
DEPARTMENT OF NON COMMUNICABLE DISEASES
MINISTRY OF HEALTH, P.O. BOX 30016-00100

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